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Khalilzade A.
Baku State University

FROM THE DATE OF LAUNCH OF ARTIFICIAL SATELLITES IN AZERBAIJAN

The purpose of this article is to consider the history of launching artificial satellites in Azerbaijan. The study shows that in Soviet times, certain practical steps were taken in Azerbaijan to develop the space industry. During the years of the national leader Heydar Aliyev's rule, important work was carried out to create and develop the Azerbaijani national space industry, the necessary scientific and material and technical bases were created. It is noted that in the 1970s, significant advances were made in the field of cosmonautics, the first generation of cosmonauts was formed, and numerous studies were conducted to study the Earth and near-Earth space. It is emphasized that at that time, the priority was to study the Earth's natural resources and the state of the environment more effectively and globally using space vehicles. The task of developing the space industry and launching artificial satellites in independent Azerbaijan began to be implemented in the 2000s and continues to this day.

Methodology and methods. The study used several research and information methods of historical science, such as induction, historicity, comparative analysis and analogy. For this purpose, scientific works were used, especially the works of Azerbaijani scientists.

The novelty of the article lies in the fact that for the first time the adopted state program for an artificial Earth satellite of Azerbaijan in modern times has been comprehensively analyzed, the main aspects of the implementation of this program have been classified. It is noted that the strategic position of Azerbaijan and its location in the center of the information hub is due to its keeping up with international cooperation in this direction. All this has led to the need to launch its own artificial satellites into orbit.

Results: It is noted that Azerbaijan has rapidly mastered international experience in the field of creating a space industry and launching artificial satellites into orbit. It is emphasized that practical activities in this direction have been carried out since the 1970s. At present, Azerbaijan has taken a broad strategic line regarding the development of the space industry, defined the main goals, formulated a theoretical concept and achieved success in creating mechanisms for implementing activities in this direction.

Key words: *Azerbaijan, artificial satellite, space, technology, industry, device, designer.*

Problem statement. After Azerbaijan regained its independence, the political processes taking place in Azerbaijan in the early 1990s had a negative impact on the space industry, and specialized personnel in this field were forced to leave the country, and the acquired knowledge, experience and traditions were lost.

The modern space industry of Azerbaijan developed significantly during the years of President Ilham Aliyev's rule. A strategic line was defined for the development of this field. On November 4, 2008, the Decree of the President of the Republic of Azerbaijan "On the establishment of the space industry in the Republic of Azerbaijan and the launch of telecommunications satellites into orbit" was signed in order to give impetus to the application of high technologies and the creation of the space industry in Azerbaijan [1]. The decree was of great importance. Thus, state programs and practical measures implemented in connection with the development of the non-oil sector opened up wide opportunities for the diversification of the economy and the development of new industries, and Azerbaijan's strategically favorable geographical location necessitated the preparation and launch of telecommunications satellites, which are the main components of economic and information security [1]. According to the order, the necessity of establishing a space industry in the country is indicated by the favorable geographical and economic location of Azerbaijan between the European and Asian continents, the preparation and launch of telecommunication satellites, which are the main components of economic and information security. In other words, space-related plans are not only commercial projects, but also an information security issue for Azerbaijan, which is located in

a rather complex region. This gives grounds to say that the political decision made on the development of the space industry is also a strategic issue for the future [2].

The study shows that in 2008–2009, approximately 270 satellites were operating in the world, with a total number of transponders of more than 5,000, and more than 30 countries had telecommunications satellites. Revenue from satellite communications also continued to grow. In 1996, this figure was 16 billion US dollars, in 2002 it reached 50 billion US dollars, and in 2008–2009 it reached 100 billion US dollars [3].

Since those years, a state institution has been operating in Azerbaijan, the National Aerospace Agency, under the Ministry of Defense Industry of the Republic of Azerbaijan (MSN), which is directly involved in the creation of space equipment and technologies and the use of aerospace data to solve various applied problems. One of the most important achievements of the MAKA was the construction of space equipment, the creation of sub-satellite systems and complexes, and the implementation of various projects.

MAKA was also expanding its international relations in the field of space industry. Thus, since the beginning of 2007, the UNISCAN-24 Space Data Receiving Complex was installed and operated at MAKA under the agreement concluded between the Special Design Bureau of Space Instrumentation of MAKA and the Russian Scientific Research Institute of Space Instrumentation within the framework of the "Economic Cooperation Agreement" between the Republic of Azerbaijan and the Russian Federation [3].

During these years, Azerbaijan achieved significant achievements in the field of information and communication technologies. The most priority direction in the field of information and communication technologies was the development of the space industry. In this field, the 10-year National Strategy for the Development of ICT, which was adopted for the first time in the region by the Decree signed by the National Leader Heydar Aliyev in February 2003, was of great importance. After this strategy was completed in 2012, for the faster development of ICT, Orders and Decrees of the President of the Republic of Azerbaijan were signed in 2012 regarding the establishment of the State Fund for ICT Development, High Technologies Park, Information Security Center and State Agency for Information Security. On January 15, 2013, President Ilham Aliyev, speaking at the meeting of the Cabinet of Ministers dedicated to the results of socio-economic development in 2012 and the tasks ahead in 2013, declared 2013 the "Year of Information and Communication Technologies" taking into account the attention paid to the ICT sector and the successes achieved in this field [2].

Thus, the strategic line of state policy in the field of information and communication technologies was determined.

The commissioning of an optical observation satellite in Azerbaijan was set as the main goal. This issue was reflected in the "State Program on the Creation and Development of the Space Industry in the Republic of Azerbaijan" approved by the Decree of the President of the Republic of Azerbaijan dated August 17, 2009, in the Development Concept "Azerbaijan 2020: A Look into the Future" approved by the Decree No. 800 of the President of the Republic of Azerbaijan dated December 29, 2012, and in other conceptual documents [4].

The State Program adopted in 2009 was supposed to initiate the establishment and strengthening of coordination between state, scientific and relevant business organizations in the field of space activities, study of international experience, establish relations with international organizations, and create infrastructure. Establishing relations with international organizations of Europe in this field is one of the priority directions for Azerbaijan. The smallest countries that are members of these organizations actively participate in the implementation of a number of global space projects. One of the most important and necessary issues in this area should be considered sending local personnel to gain experience in international satellite companies, etc. [5].

The study shows that in 2008–2009, the technological equipment of the space industry in Azerbaijan was not sufficiently developed, the existing space industry complex, technology for receiving and processing space information was outdated and out of order. There was a serious need to create new production and processing technologies in factories, other production and experimental sites operating in this area, and to apply ICT in management [3]. The "State Program on the Creation and Development of the Space Industry in the Republic of Azerbaijan" adopted by the President of the Republic of Azerbaijan on August 17, 2009, envisaged the reconstruction of the space industry, the adoption of the latest technologies and the organization of local production as important directions. The state program envisaged the following strategic goals in the field of space industry development: ensuring and strengthening national and information security; expanding integration into the global information space; satellite

systems, their management and operation, as well as improving the regulatory legal framework for the creation and development of the space industry; creating conditions for attracting investments in the space industry; conducting research on environmental monitoring and forecasting and studying man-made emergencies in the territory of the republic, assessing the scale of oil spills at sea and on land; creating conditions for the republic's participation in international space programs; training specialists in the field of space industry and satellite systems, creating and developing the space industry, etc. [1].

The state program envisaged the implementation of important works related to the creation and development of the space industry – first of all, the purchase and widespread application of ready-made systems for the purpose of creating a space industry, studying their effectiveness and preparing proposals for their production in the country, organizing the assembly and production of various equipment in the republic by purchasing the main parts of space equipment from abroad, creating a local base of the main profiles of the production of space industry equipment, studying the possibilities of creating technological potential for the preparation and launch of small satellites into orbit, organizing the reception and processing of space information [1].

The location of the Republic of Azerbaijan at the intersection of favorable geoeconomic, geographical, as well as information highways between Europe and Asia is of great importance in terms of eliminating the dependence of information exchange on foreign countries, and the preparation and launch of telecommunication satellites, which are the main components of economic and information security, into orbit, making Azerbaijan a leading country in the field of information transmission in the region [3]. It should be noted that in order to launch a satellite into orbit, it was first necessary to obtain an orbital position. Since its legal successor passed to Russia after the collapse of the USSR, Azerbaijan, like the former Soviet states, did not have its own orbital position. However, after negotiations with the International Telecommunication Union (ITU), this organization transferred 3 orbital sectors to Azerbaijan [2].

In the years under study, there were factors in Azerbaijan that necessitated the creation and development of the space industry, as well as artificial satellites. In the first decade of the 21st century, the rapidly developing and spreading information and communication technologies, and the associated new globalization processes, seriously affected the socio-economic life of countries, including Azerbaijan. Global factors penetrated the processes taking place in almost all areas of the country's life – economic, social, political, humanitarian-cultural, etc. As in every country, in Azerbaijan, due to their origin and sphere of influence, there are regional or domestic factors, the consideration of which in the management of various areas of the country's public life is important in terms of the formation of an effective policy. With the qualitative expansion of innovation activity in the era of globalization, the pace of change of economic and economic processes throughout the world, the spread of innovative innovations, and their application in the field of production are accelerating at an unprecedented pace. In such circumstances, the main issue facing Azerbaijan was not to lag behind the development rate of world countries [6].

First of all, in connection with the development of the non-oil sector in Azerbaijan, wide opportunities were opened for the diversification of the economy and the development of new industries. The field of information and communication technologies was declared a priority area in Azerbaijan. The field of communications and information technologies was expected to become the most developed sector of the Azerbaijani economy after the oil industry. The widespread application of information and communication technologies was also of particular importance in terms of ensuring national security in the information field.

While satellites launched into orbit in the 60s–70s of the 20th century were mainly used for communication and television and radio broadcasting, the emergence of new VSAT (small-scale satellite terminal) technology in the 80s gave a great impetus to the development of local, intercity and international communications in wider areas. Since the late 90s of the 20th century, the application of satellite systems has created the opportunity to create higher-quality and reliable communication systems in the world and to establish digital television and radio broadcasting systems and networks. Since 2000, the demand for satellite resources has further accelerated the application of new technologies in this field [1]. Azerbaijan has not been left out of these processes taking place in the world, and practical steps have been taken to develop this sector of the industry.

The "State Program on the Creation and Development of the Space Industry in the Republic of Azerbaijan" adopted on August 17, 2009, determined the factors influencing the development of this space industry and strategic goals in this area. The main goal was to create and develop the space industry in Azerbaijan, meet the needs of state structures for

satellite communications, increase the country's international communication channels, and develop economic, social, scientific, cultural, security, etc. areas through the effective use of space. The state program indicated that the launch of an Azerbaijani satellite into a geostationary orbit is of particular importance in order to organize satellite communication services more widely and qualitatively. For this purpose, it is planned to launch a telecommunications satellite into orbit. It was planned that the Azerbaijani telecommunications satellite, operating in the C and Ku band frequency range, would cover the entire territory of Europe and a large part of Asia [1].

According to the State Program for the Creation and Development of the Space Industry in the Republic of Azerbaijan, important strategic goals were defined. These strategic goals included ensuring and strengthening national and information security, integration into the global information space, improving the regulatory legal framework for the creation and development of the space industry, creating conditions for attracting investments in the space industry, providing the territory of the republic with satellite communications, radio and television broadcasting, meeting the needs of state structures for special communications, conducting research on environmental monitoring and forecasting and studying man-made emergencies, assessing the scale of oil spills at sea and on land, stimulating local production and supporting its export potential, training specialists in the field of the space industry and satellite systems, etc. The document indicated the importance of carrying out related work on the creation and development of the space industry [1]. The study shows that although a number of state structures, private companies, and joint commercial organizations in the Republic of Azerbaijan deal with the use of satellite information, these have not been of a permanent application and commercial nature, and fundamental scientific research has been a minority. The Aerospace Agency, established in Azerbaijan at the initiative of the national leader Heydar Aliyev and operating since 1975, has been engaged in fundamental scientific research and the development of devices for space vehicles for a long time during the Soviet Union and the years of independence, and work in this direction has been successfully carried out. Thus, several devices developed by Azerbaijani scientists and specialists have been installed on the Mir orbital station, candidate and doctoral dissertations have been defended in this direction, and scientific works and monographs have been published [7].

In the years under study, practical work related to the development of the space field continued. In accordance with the Decree of the President of the Republic of Azerbaijan dated October 17, 2017, the Council for Space Issues of the Republic of Azerbaijan was established by the decision of the Cabinet of Ministers of the Republic of Azerbaijan [8].

The main functions of the Council of the Republic of Azerbaijan on Space Issues, approved by the Resolution of the Cabinet of Ministers of the Republic of Azerbaijan dated September 23, 2020, are specified in the Regulations on the Council of the Republic of Azerbaijan on Space Issues. The functions of the Council included monitoring the implementation of tasks arising from state programs in the field of space activities by relevant agencies, organizing systematic research in the direction of conducting work on the study and use of space space, including deep space, considering proposals and making recommendations on solving complex problems of forming a scientific and technical, production, user, educational and innovation structure for the use of the results of space activities in the Republic of Azerbaijan and abroad, conducting space research, including research in space, preparing proposals on the use of such research and the space industry, etc. [9]. The State Program for the Development of Remote Earth Observation Services by Satellite in the Republic of Azerbaijan for 2019–2022 had a number of goals and tasks arising from this. The main goal was to support the socio-economic and technological development of the country by using satellite observation services in various fields. To achieve this goal, a number of tasks were envisaged – optimal use of the resources of «Azersky» and other high-resolution remote Earth observation satellites, formation of an economic and technological environment for creating economic value and obtaining commercial benefits in various fields, support for increasing the efficiency of the activities of state bodies, increasing the efficiency of scientific research, and expanding export potential in the field of processing and sale of satellite images [4].

The development of the space industry remains a priority. By the Decree of President Ilham Aliyev dated April 27, 2021, the Space Agency of the Republic of Azerbaijan (Azercosmos) was established under the Ministry of Transport, Communications and High Technologies (MTCHT). The Agency was established on the basis of "Azercosmos" OJSC in order to continue the successes and development achieved in the field of space activities, to further benefit Azerbaijan from the rapid technological progress taking place in the world, and to improve

the management, regulation, coordination and control mechanisms in the field of space activities [10].

The Space Agency of the Republic of Azerbaijan is a public legal entity that participates in the formation and implementation of state policy in the field of space activities, performs regulation and control in this field, carries out functions of state and public importance in the field of launching, managing and operating telecommunications, Earth observation and other satellites into orbit, participating in international space projects, and cooperating with relevant international organizations and relevant state agencies of foreign states in the field of peaceful use of space [10]. "Azercosmos" has entered a new stage with its Agency function. The transformation of "Azercosmos" OJSC into the Space Agency of the Republic of Azerbaijan and its operation under the Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan would serve to further benefit Azerbaijan from the rapid technological progress taking place in the world and to improve the management of space activities in Azerbaijan [11].

Conclusions. Thus, Azerbaijan has mastered international experience in the field of creating a space industry and launching artificial satellites into orbit, and has been carrying out practical activities in this direction since the 1970s. Azerbaijan has taken a broad strategic line regarding the development of the space industry, determined the main goals, formulated a theoretical concept and succeeded in creating mechanisms for implementing activities in this direction. The study shows that Azerbaijan's strategic position and location in the center of the information hub have made it necessary to launch artificial satellites into orbit in order to not lag behind international cooperation in this direction and to obtain reliable, accurate, and operational information.

Bibliography:

1. Azərbaycan Respublikasında kosmik sənayenin yaradılması və inkişafı üzrə Dövlət Proqramı. 17 avqust 2009-cu ildə qəbul edilmişdir/ Bakı, [Elektron resurs] URL: http://www.e-qanun.az/framework/18269. (дата звернення: 20.12.2024).

2. İlk telekommunikasiya peykinin orbitə buraxılması Azərbaycanın inkişafının zirvəsidir: Bakı, [Elektron resurs]. URL: https://yeniazerbaycan.com/Iqtisadiyyat_e11208_az.html13.02.2013. (дата звернення: 18.11.2024).

3. Qorxmaz A. Azərbaycanın 160 milyon dollarlıq ilk milli peyki: Bakı, [Elektron resurs] URL: https://modern.az/az/news/1624. 30 Noyabr 2009, 12:53 (дата звернення: 24.11.2024).

4. Azərbaycan Respublikasında peyk vasitəsilə Yerin məsafədən müşahidəsi xidmətlərinin inkişafına dair 2019–2022-ci illər üçün Dövlət Proqramı / 15 noyabr 2018-i ildə təsdiq edilmişdir: Bakı, [Elektron resurs] URL: http://www.e-qanun.az/framework/40724. (дата звернення: 24.12.2024).

5. Əziz, A. Görəsən öz milli peykini orbitə çıxaran Azərbaycan bundan nə qazanacaq?: Bakı, Exo qəzeti. 02.05.2009.

6. "Azərbaycan 2020: Gələcəyə baxış" İnkişaf Konsepsiyası / 29 dekabr 2012-ci ildə təsdiq edilmişdir: Bakı, [Elektron resurs] URL: https://e-qanun.az/framework/ 25029. (дата звернення: 2.01.2025).

7. Hacızadə, F. Azərbaycan dünya kosmik klubunun tamhüquqlu üzvüdür: [Elektron resurs] / Bakı, 25.01.2019 [14:51] URL: https://surl.li/cpfjee (дата звернення: 20.12.2024).

8. Azərbaycan Respublikasının Kosmik Məsələlər üzrə Şurasının yaradılması, "Azərbaycan Respublikasının Kosmik Məsələlər üzrə Şurasının Əsasnaməsi"nin və "Azərbaycan Respublikasının Kosmik Məsələlər üzrə Şurasının tərkibi"nin təsdiq edilməsi barədə Azərbaycan Respublikası Nazirlər kabinetinin qərarı / 23 sentyabr 2020-ci ildə qəbul edilmişdir: Bakı, [Elektron resurs] URL: http://www.e-qanun.az/framework/46033. (дата звернення: 20.12.2024).

9. Azərbaycan Respublikasının Kosmik Məsələlər üzrə Şurası haqqında Əsasnamə // 23 sentyabr 2020-ci ildə qəbul edilmişdir: Bakı, [Elektron resurs] URL: http://www.e-qanun.az/framework/46033. (дата звернення: 24.12.2024).

10. "Azərbaycan Respublikasının Kosmik Agentliyi (Azərkosmos)" publik hüquqi şəxs: [Elektron resurs] / Azərbaycan Respublikası Rəqəmsal İnkişaf və Nəqliyyat Nazirliyinin rəsmi saytı. Bakı, 20 fevral 2024-ci il. URL: https://mincom.gov.az/az/view/organization/29/ (дата звернення: 24.12.2024).

11. Azərbaycan dünyanın azsaylı kosmik ölkələrindəndir: Bakı, [Elektron resurs] URL: https://xalqqazeti.com/az/news/76685 (дата звернення: 02.12.2024).

Халілзаде А. З МОМЕНТУ ЗАПУСКУ ШТУЧНИХ СУПУТНИКІВ В АЗЕРБАЙДЖАНІ

Метою цієї статті є розгляд історії запуску штучних супутників Землі в Азербайджані. У дослідженні показано, що за радянських часів в Азербайджані було здійснено певні практичні кроки щодо розвитку космічної промисловості. У роки правління загальнонаціонального лідера Гейдара Алієва було проведено важливу роботу зі створення та розвитку національної космічної промисловості Азербайджану, створено необхідні наукові та матеріально-технічні бази. Зазначається, що у 1970-х роках було досягнуто значних успіхів у галузі космонавтики, сформовано перше покоління космонавтів, проведено численні дослідження з вивчення Землі та навколоземного простору. Наголошується, що на той час пріоритетним було вивчення природних ресурсів Землі та стану навколишнього середовища більш ефективно та глобально з використанням космічних апаратів. Завдання розвитку космічної промисловості та запуску штучних супутників Землі в незалежному Азербайджані почало реалізовуватись у 2000-х роках і триває до сьогодні.

Методологія та методи. У дослідженні використовувалися кілька дослідницьких та інформаційних методів історичної науки, таких як індукція, історичність, порівняльний аналіз та аналогія. Для цього були використані наукові праці, особливо праці азербайджанських учених.

Новизна статті полягає в тому, що вперше всебічно проаналізовано прийняту державну програму зі штучного супутника Землі Азербайджану в новітній час, класифіковано основні аспекти реалізації цієї програми. Зазначено, що стратегічне становище Азербайджану та його перебування у центрі інформаційного хаба обумовлено його не відставанням від міжнародного співробітництва у цьому напрямі. Усе це призвело до необхідності виведення орбіту своїх штучних супутників.

Основні результати: Відзначено, що Азербайджан стрімко освоїв міжнародний досвід у галузі створення космічної промисловості та виведення на орбіту штучних супутників. Наголошується, що практична діяльність у цьому напрямі ведеться із 1970-х років. В даний час Азербайджан взяв широку стратегічну лінію щодо розвитку космічної промисловості, визначив основні цілі, сформулював теоретичну концепцію та досяг успіхів у створенні механізмів реалізації діяльності в цьому напрямку.

Ключові слова: *Азербайджан, штучний супутник, космос, технологія, промисловість, пристрій, конструктор.*