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Space strategies as an element of shaping national security

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dr inż. Radosław Bielawski
Instytut Techniki Lotnictwa i Mechaniki Stosowanej Wydziału Mechanicznego,
Energetyki i Lotnictwa Politechniki Warszawskiej
https://orcid.org/0000-0002-5701-4476

1. INTRODUCTION

The recognition of space in late 2019 as a new area of military operations – the fifth domain of combat – became the beginning for the development of various types of documents with a strategic nature. Documents of such stature are part of the national strategy as well as a tool of a country's security and development policy. They define the way in which the military potential should be developed and used to achieve the state's goals. It should be noted that strategic documents in relation to space are a publishing novelty. Therefore, there are single publications on this subject in the world literature. Making the assumption of their complementarity, the basic research problem of this paper remains the anticipation of themes and contents defined in them for the future development of such documents.

The subject of research are two contemporary space strategies, published by the United Kingdom and France. The aim of this paper is to identify the common parts and differences, which are the basis for development of future space strategies. The research inquiry uses synthesis and comparative analysis.

2. BRITISH NATIONAL SPACE STRATEGY

The British National Space Strategy was published on August 27, 2021 and is available on the official UK government website[1]. The document defines the national vision, which is to build one of the world's most innovative and attractive space economies, protect national interests in space, and maintain global leadership in space science and technology. This vision will be implemented through five specific objectives. These will be achieved by working closely with UK companies, academia, innovators and international partners and allies.

As the first of the strategic objectives was defined – to develop and improve the state's space economy. It is assumed that the UK will be one of the most attractive state actors supporting business activities in developing new commercial opportunities. The second factor is the development of a national space ecosystem, the objectives of which will include increasing employment in the country, increasing exports, and attracting investment. The second development objective of this strategy is to promote the United Kingdom's value as a global actor. This will be achieved by supporting an open international order, demonstrating global leadership, initiating and leading discussions on the safety, security and sustainable development of space. A further determinant in achieving the goal is the desire to avoid escalation of international disputes and conflicts. The UK in this area has ambitions to develop rules governing the peaceful and responsible use of space, thus creating opportunities for scientific and industrial development. The third objective defined in the British strategy concerns the activity of scientific discovery and inspiring the nation. It concerns support of conducting research and development of technology in order to maintain strategic advantage. The fourth objective is to protect and defend national interests in space. It will be implemented through increasing the autonomy level and resilience of space technologies under construction, mainly Positioning, Navigation and Timing (PNT) services. Security of sensitive technology transfers to ensure that they are not used in foreign space programs remains an important identified aspect in achieving this objective. The fifth and final defined objective of the strategy concerns the use of space for national and global benefit. Global climate change, Host Nation Support (HNS), and national border protection have been identified as challenges[2]. Space will also serve to meet the Sustainable Development Objectives set out in the resolution by the United Nations[3].

The United Kingdom's achievement of the above strategic objectives will be achieved through activities in four pillars: release of growth in the space sector, international cooperation, development of the United Kingdom as a superpower in science and technology, development of space capabilities and services. In terms of the first one – release of growth in the space sector – it is mainly planned to focus activities on supporting defence and security companies in their activities in Space. These will be implemented by: taking advantage of high-growth areas and the emerging sector, building trade, releasing innovation, supporting talent, and regulatory changes in procurement. Under the first pillar, activities on "cultivating talent" are envisaged. It has been noted that the space sector requires skilled staff as well as their improvement of skills. It is envisaged that the government will work closely with employers and training providers to improve the quality of training. The selection of employed staff is governed by a document – the Government's Plan for Jobs[4], which mainly focuses on protecting, supporting and creating jobs in the UK.

The second pillar of activity in achieving the operational objectives is international cooperation, focused on bilateral and multilateral partnerships with other space actors. The main partners envisaged to strengthen this relationship are the United States, the Five Eyes alliance countries (FVEY)[5], as well as government organizations such as NASA, and the Japan Aerospace Exploration Agency (JAXA). For the implementation of civilian scientific research, the European Space Agency (ESA) remains the British partner. Several joint ventures are planned as part of such activities. The first will be to conduct innovative missions aimed at exploring the Solar System, as well as to construct a rover designed to acquire and then test samples from the

Martian surface on Earth. Another important bilateral undertaking is cooperation in preparing and sending personnel to work on the International Space Station. There are also plans to implement a joint project called TRUTHS the leader of which is to be the United Kingdom. Other initiatives under the second pillar include participation in Horizon Europe[7] and Copernicus[8] programs. As a part of international cooperation, on February 23, 2021, the "UK-Australia Space Bridge" was established. The purpose of this agreement, in terms of space activities, is to increase trade and investment, initiate scientific and research activities, share good practices, increase commercial activities by encouraging entrepreneurs to take advantage of facilities, as well as remove barriers for companies entering the market[9]. Under the second pillar, the UK also envisages diplomatic activities that will target an open and stable international order. The premise of these activities is for the UK to act as a security leader to recommend legislative changes that regulate the peaceful and sustainable use of space and limit hostile actions directed at space assets, including the use of weapons in space.

The third defined pillar of achieving strategic objectives in space regards the UK as a superpower[10] in science and technology. Such a statute is planned to be achieved through the use of its own reservoir – human scientific potential, construction and development of existing research facilities and cooperation with companies in order to achieve an outlay of 2.4% of Gross Domestic Product in 2027. One of the tools for implementing the tasks of the third pillar is participation in the Defence Science and Technology Space program (Military Defence Technology, 2019). This project involves acquiring space capabilities to provide persistent communications, support Intelligence, Surveillance and Reconnaissance (ISR) activities, Positioning, Navigation and Timing (PNT) capabilities and provide situational awareness in Space.

The fourth pillar defined in the British strategy concerns the development of space capabilities and services. Eight such capabilities have been defined, which include Satellite Communications (SATCOM), Earth Observation (EO), ISR, Command and Control as well as Space Capability Management, Space Control, PNT, Space Launch Capability, In Orbit Servicing and Manufacturing (IOSM), Space Domain Awareness (SDA). In the area of satellite communications, it is planned to develop a global, secure and resilient satellite communication system for information exchange through satellites and ground stations for civil-military purposes. This includes an investment of 5 billion pounds/10 years in an indigenous program called Skynet 6. This will be used to provide data to the UK Armed Forces and NATO allied countries. In terms of acquiring an Earth observation capability, it is expected to develop a system to collect observation data and electronic intelligence anywhere on the Earth's surface for both civilian and military purposes. Command, control, and management of space capabilities will focus on developing optimal organizational structures and improved processes to direct resources to space activities. Space control in the British strategy is understood as the ability to maintain a high degree of resilience to disruption of space systems. The PNT capability will be developed mainly based on the use of networks in new 4G and 5G technologies. Achieving in-orbit launch capabilities will mainly be used for satellite launch and scientific research capabilities. Servicing and manufacturing in space is an important capability that the UK aims to achieve. Its goal is to minimize the cost of operating satellite systems by constantly maintaining them in high technical quality, as well as modifying and servicing them periodically. The ability to acquire Space Situational Awareness relates to the

ability to detect, identify and track objects in space and to monitor the changes and effects of space weather.

The implementation of the British National Space Strategy is divided into four progressive, time-defined phases. The first one – the Countdown Phase – is planned until the end of 2021. This period includes the publication of the Defense Space Strategy and the Severe Space Weather Preparedness Strategy[11]. It sets out a five-year vision of how space weather will change and its impact on security. As part of the work during this period, it is also planned to develop criteria and indicators to evaluate the strategy implementation. The second – the Ignition Phase – will be implemented in 2022-2023. During this period it is planned to establish financial programs and perform the first orbital launches. The main phase – the Thrust Phase – of the British Space Strategy will be implemented by the end of 2030. By this period, it is envisaged that economic and social benefits will have been achieved, as well as the achievement of superpower status in the field of new technologies, including space technologies. The launch of the last phase – the Orbit Phase – is planned after 2030. The long time horizon will first require updating the strategy's provisions, adjusting them to the changing space security environment. In this phase it is envisaged that the strategy objectives will be met, mainly achieving the status of a modern space-faring nation, becoming a science and technology superpower, increasing the security level, and the UK playing a leading role in space market segments.

FRENCH SPACE DEFENSE STRATEGY

The French Space Defence Strategy document[12] was published in 2019. It consists of three main chapters, which are preceded by a foreword by the French Minister of Defense, Mrs. Florence Parly. Among the contents presented, the Minister points out the importance of this operational area and the dependence on Space to conduct military operations. Moreover, she expresses the ambition that France will become the third space power in the world by 2030[13].

The first chapter of the strategy refers to this operational area as an important domain for the armed forces. As stated in the document, it is estimated that space in this aspect will be an area of particular interest until around 2040. With regard to military applications, it includes a selective threat analysis. It is recognized that the Space domain is a particularly hostile environment with extreme physical environmental conditions – large temperature amplitudes and strong ionizing radiation. Another defined modern threat is space debris[14]. These are particularly dangerous to orbiting space objects, such as orbiting satellites. When an object between one and ten centimeters in size collides with a satellite, it can cause severe damage to the satellite. Objects larger than ten centimeters can not only completely destroy the satellite, but also generate further space debris resulting from the defragmentation of destroyed object. Although some space debris undergoes natural deorbitation (12 years for an object moving at an altitude of 500 km), the rapid growth of launched space objects increases the likelihood of such collisions[15].

Within this part of the strategy, reference was made to the legal framework for Space. It was emphasized that this area is *res communis*, i.e. with free access and use, in contrast to airspace, which is fragmented and the state over which it is located exercises full and exclusive sovereignty in it. This state of law makes access unrestricted. Accordingly, the conduct of scientific research in this environment is also

fully accessible, which implies the possibility of conducting activities of both civil and military nature. The provisions of international law state that space must be used for peaceful purposes, which does not mean that it cannot be used for military activities. The law even permits the weaponization of outer space[16] on the condition that weapons of mass destruction[17] are not deployed in the area, as well as the use of force[18]. Space activities are the states' responsibility, regardless of whether they are carried out by a government agency or a non-governmental organization. According to this principle, states are required to monitor private space activities, register space objects, and authorize their launches.

Further contents of the first chapter of strategy document indicate the development directions in space. France is highlighted here as a space superpower – both in military and civilian terms. The main military focus is on capabilities such as control over optical or radar observation, signals intelligence (SIGINT), geospatial intelligence (GEOINT), satellite telecommunications, satellite meteorology, navigation and synchronization. These capabilities are necessary to achieve autonomous situational awareness and military decision-making and action capabilities. The protection of French national interests, through space capabilities, can be achieved through two options. The first is early warning. This enables the monitoring of ballistic missile proliferation and activities, defense against ballistic means, identification of the aggressor, passive defense and space surveillance. The second operational capability is maritime surveillance, implemented through the automated detection, identification and tracking of civilian and military maritime objects.

The French space strategy, while assuming free access and operation in Space, anticipates the emergence of new threats of a military nature. These threats involve both offensive and defensive capabilities and target space assets – individual system segments (e.g., global satellite navigation), software components of satellite systems, and others. The French strategy includes five types of space threats: cyber threats, electromagnetic jamming, orbital services, conventional threats, and kinetic threats. With respect to cyber threats, they were considered to be among the most probable threats affecting the space segment. They are characterized by the difficulty of detecting the aggressor. They can have both reversible and irreversible effects – along with seizure of control leading to physical damage to a component, subsystem, or device. Electromagnetic jamming mainly targets ground segment equipment of navigation systems such as GNNS, Galileo. The effects of this type of threats are usually reversible. The problem is usually the identification of its source. Another type of threats are orbital services. They result mainly from commercialization of space and wide access to its resources. Activities such as refueling, inspection, and parts exchange enable Rendezvous and Proximity Operations (RPO) and other activities such as interception or destruction of space objects. Another group of space threats identified in the French document are conventional threats. They mainly consist of: sabotage, attacks on ground infrastructure and energy systems. Their source is the low state of system security, as well as human error. As kinetic threats are considered the possession of ASAT weapons – launched from the ground, from the air, as well as orbiting means. Additionally, space giants with such capabilities were identified, which included: The United States, Russia, China, and now India. The effects of such impacts are irreversible and usually associated with physical destruction of an object. Additionally, they are a source of increased space debris.

Strategic records indicate the need to defend state interests in space. The French

ambition indicates two aspects in this area. The first is the enhancement of space environment monitoring capabilities, which would aim to increase the ability to detect threats in space. For this purpose, it will benefit from space situational awareness capabilities, whether this system is autonomous or shared with allies or other partners. Second, France emphasizes defense against unlawful aggression, using tools such as international law in this regard. Such threatened assets are mainly military and commercial satellites, as well as allied and EU satellites. In terms of defending state interests in space, three factors are anticipated to strengthen France's position. These include the freedom of access to space, secondly, the peaceful and responsible, i.e. non-aggressive use of this area. The third factor is the development of a legal framework. With respect to the last factor, the strategy's provisions reserve France's rights in the case of aggression. First, the concept of retaliatory and countermeasures is reserved. This assumes that the countermeasures must be necessary and proportional to the act of aggression used. In addition, a strategic dialogue with partners and a clarification of cooperation with allies is assumed. Cooperation with the private sector with space capabilities is also an important element here. From the point of view of international law, France expresses concern about the use of weapons in space, identifying the problem of monitoring their deployment in space. Another legal issue is the promotion of standards to regulate activities aimed at reducing the creation of space debris as far as possible, particularly those with long lifetimes.

As regards the international cooperation, it is planned to cooperate with Germany, which is regarded as an indispensable strategic partner. The basis of cooperation will be observation through exchange of French optical data and German radiolocation data. It is envisaged to extend the cooperation with exchange of data concerning space situational awareness and military Earth observation program called Optical Space Component. The second important partner of France is Italy, with which France plans to maintain the existing cooperation on the exchange of observation data (optical from France, radar from Italy). There are also plans to develop joint telecommunications satellites, both military (SICRAL 2) and dual use (ATHENA-FIDUS). Another French strategic partner is the United Kingdom. Cooperation between the countries relates to the planning and implementation of space operations. These are carried out in close cooperation with the United States, as well as other partner countries. In addition to European countries, France maintains, in the field of space, relations with the European Union. The cooperation will concern the implementation of the following programs: the Copernicus Earth observation system, the construction of the Galileo positioning, navigation and timing system and the implementation of the EUSST and GovSatcom programs. Cooperation within NATO, due to the use of capabilities provided by individual members of the alliance, will consist of developing a common general space policy. Another state actor with which France has a space security relationship is the United States. The cooperation consists of the use of Space Track data. Other regular French space partners are India, Japan, Canada and Australia.

The French space strategy in its next section includes a roadmap. It contains three basic phases: strengthen space doctrine, establish basic principles and typologies of military operations, review space management, and provide adequate resources and personnel. Military space operations involve the operation of acquired space capabilities. They are at the same time a guarantor of national security, economic growth and civil protection. In carrying out such tasks they perform four functions:

space service support, provision of space situational awareness data, operational support, and active space defense. Space service support involves the deployment, implementation, and availability of space assets. It includes four primary tasks. The first is launching and deploying objects in space. The second is building space infrastructure, such as the construction of the launch complex at the Guyana Space Center. The third task is maintaining the launched space objects – satellites. The final, fourth, task is capability restoration, which involves restoring, compensating, or replacing a missing capability through allied or commercial support. Control of space situational awareness is a condition for both safe conduct of military operations and commercial use of Space. With the system, three services can be provided. First of all, it is possible to assess threats posed by enemy space systems, and to plan counteraction to those threats. The second function is to prevent collisions between active satellites and other objects in space. The third function refers to coordination with other space actors to counter disruption of space assets. Operations support includes the execution and operation of payloads that provide the following space capabilities: ISR, early warning and launch tracking of missile assets, monitoring of the geographic, physical, and human environment, as well as satellite communications (SATCOM) and provision of PNT services. In terms of the last function – active space defense, actions are planned to preserve the freedom of access to space, as well as to thwart undesirable activities and those that do not comply with international legal regulations. For this purpose, diplomatic, media and legal means will be used.

Another issue addressed by the French space strategy is the doctrine for conducting space operations. The doctrinal framework is intended to ensure coherence and interoperability with allies. The data used to develop the document will come mainly from military training and exercises, conducted in cooperation with other partners. In addition to the doctrine, it is necessary to develop military space structures. In 2010, the Space Command (Commandement Interarmées de l'Espace – CIE) was created. Its task was to develop and implement a space policy, as well as define operational and technical requirements for military space capabilities. The French document emphasizes the problem of unified command of space operations, and the consequent need to reorganize the current structure, as well as to develop a legal framework, inter-ministerial coordination and international cooperation. This task will be entrusted to the Air Force, which, as a result of the structural and personal transformation, will be renamed the Air and Space Force.

CONCLUSIONS

Based on the above research material, several general conclusions can be drawn:

1. In two of the strategies analyzed (British and French), only the British National Space Strategy defines a vision and strategic goals. The British vision is to build one of the world's most innovative space economies, protect state interests, and maintain scientific and technological superiority. The goals, on the other hand, include: development and improvement of the space economy, state promotion, discovery and scientific activities, protection of national interests, and the ability to use Space for national and global benefit.
2. Analyzing the strategic documents, it was found that there are fundamental differences in the achievement of strategic objectives (the French strategy does not specify objectives). The British documentation specifies the achievement of strategic objectives through four factors: release of growth in the space sector, international cooperation, state development and pursuit of superpower status, development of capabilities and services. French records specify two ways to achieve the strategic objectives. These are monitoring the space environment and applying international space law.
3. The French space strategy includes reference to international space law. Its provisions allow civil-military scientific research and weaponization of space. They indicate as restrictions the prohibition of weapons of mass destruction deployment and the use of force. These acts specify that activities of a civil-military nature are the responsibility of the state concerned. The British National Space Strategy document does not address legal aspects.
4. The analyzed contents in the strategy documents define the stages of achieving goals/tasks. With regard to the British document, these are four phases strictly defined by time (by the end of 2021, 2022-2023, by the end of 2030 and after 2030). The French space defense strategy defines four consecutive activities: space service support, provision of space situational awareness data, operational support, and active space defense.
5. There are fundamental differences in the approach to threat analysis. The British strategy does not address space threats. The French counterpart identifies non-military and military threats. Non-military includes: existing physical conditions in space and space debris. While military threats include: cyber threats, electromagnetic interference, orbital services, conventional threats, and kinetic threats.
6. In terms of pursuing superpower status, the same horizontal scope is set – by the end of 2030. The UK aims to become a superpower in science and technology by that time, while France aspires to become the world's third space power (it does not specify two major powers).
7. Both countries point to the need for international cooperation, mentioning European and non-European partners as well as non-state actors: NATO, the European Union, and selected space agencies.

[1] UK Government, *National Space Strategy,* 2021, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1034313/national-space-strategy.pdf [dostęp: 01.03.2022 r.].

[2] M. E. Kołodziejczak, *Funkcjonowanie Naczelnego Dowódcy Sił Zbrojnych w Rzeczypospolitej Polskiej*, Warszawa 2020.

[3] The 2030 Agenda for Sustainable Development contains 17 Sustainable Development Objectives. Some of them indirectly relate to space – innovation, industry, infrastructure, climate action (General Assembly Resolution A/RES/70/1: 2030 Agenda for Sustainable Development, 2015).

[4] HM Government, *Plan for Jobs: Progress Update. 2021*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_datafile/1016764/Plan_for_Jobs_FINAL.pdf [dostęp: 01.03.2022 r.].

[5] Five Eyes (FVEY) – is an intelligence alliance aimed at cooperation in signals intelligence between five member states. The signatories to the alliance are: Australia, Canada, New Zealand, the United Kingdom, and the United States. D. Fikretoglu *et al., Pathways to mental health care in active military populations across the Five-Eyes nations: An integrated perspective*, Clinical Psychology Review 2022, no. 91, p. 2 (DOI:10.1016/j.cpr.2021.102100).

[6] TRUTHS (Traceable Radiometry Underpinning Terrestrial-and Helio-Studies) – is a space mission to radiometrically measure geophysical variables of solar and lunar irradiance, along with polarized and unpolarized spectral irradiance of the Moon, Earth, and its atmosphere. See: N. P. Fox *et al.,Traceable radiometry underpinning terrestrial- and helio-studies (TRUTHS)* [w:] *2016 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)* 2003, ss. 2253-2261 (DOI:10.1016/S0273-1177(03)90551-5); Traceable Radiometery Underpinning Terrestrial- and Helio- Studies (TRUTHS): Establishing a climate and calibration observatory in space [w:] IEEE International Geoscience and Remote Sensing Symposium (IGARSS) 2016, ss. 1939-1942 (DOI:10.1109/IGARSS.2016.7729499).

[7] Horizon Europe – is the European Union's framework programme for research and innovation. It is planned for 2021-2027 and the amount of 95.5 billion euros will be spent on research during this period. One of the thematic clusters of this program is digital technologies, industry and space. The implementation of these themes will include research on climate and quantum techniques.

[8] Copernicus – is a program managed by the European Commission. Its purpose is to study the Earth and its environment, acquiring data from space and outside this area (the so-called in situ data). It is to support activities in the field of environmental protection, civil protection and security. The program consists of six thematic components, which concern research: satellite imaging of polar ice and snow topography, radar system with L-band instrumentation, observations of sea surface temperature and sea ice concentration, observations of Earth surface temperature, hyperspectral imaging, monitoring of anthropogenic carbon dioxide content. It is assumed that the developed measurement data will be used free of charge, and access to them will be open (*The UK Space Agency Overlooked in the Copernicus Earth Observation Program,* Orbital Today 2020, https://orbitaltoday.com/2020/07/15/the-uk-space-agency-overlooked-in-the--copernicus-earth-observation-program [dostęp: 01.03.2022 r.].

[9] „The UK - Australia Space Bridge", 2021, https://www.events.great.gov.uk/website/41117/uk-australia-space-bridge [dostęp: 01.03.2022 r.].

[10] A superpower is a state that is capable of conducting global business while also being an economic or military power. Its policies are implemented in such a way that it influences world events (T. Yamazaki, J. O'Loughlin, Superpower [in:] *International Encyclopedia of Human Geography* 2020, ss. 133–137 (DOI:10.1016/B978-0-08-102295-5.10492-5). From a powerometric perspective, the superpower is a country with a percentage of world power greater than 18% (Ł. Kiczma, M. Sułek, *National Power Rankings of Countries*, Warszawa 2020).

[11] Department for Business, Energy & Industrial Strategy, *UK Severe Space Weather Preparedness Strategy*, 2021, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1020551/uk-severe-space--weather-preparedness-strategy.pdf [dostęp: 01.03.2022 r.].

[12] The French Ministry for the Armed Forces, *Space Defence Strategy* (2019), *Paris: Impression Pôle Graphique de Paris*, https://www.defense.gouv.fr/english/layout/set/print/content/download/574375/9839912/version/5/file/Space+Defence+Strategy+2019_France.pdf [dostęp: 01.03.2022 r.].

[13] Based on our own powerometric research, the current space powers were estimated to be, respectively, the United States, the Russian Federation, the People's Republic of China (PRC), Iran, the Democratic People's Republic of Korea (North Korea), and India (R. Bielawski, *Potęgometryczny wymiar militaryzacji przestrzeni kosmicznej,* 2022, pp. 213–215).

[14] It is estimated that there are currently about 20.000 pieces of space debris larger than 10 centimeters and between 350-750.000 pieces larger than one centimeter and at least 35 million pieces larger than 1 millimeter in space. The total mass of space debris is estimated at 6 thousand tons (M. Garcia, *Space Debris and Human Spacecraft,* 2021, https://www.nasa.gov/mission_pages/station/news/orbital_debris.html [dostęp: 01.03.2022 r.,]).

[15] A. Anttonen, M. Kiviranta and M. Höyhtyä, *Space debris detection over intersatellite communication signals,* Acta Astronautica 2021, p. 157 (DOI:10.1016/j.actaastro.2021.06.023).

[16] Weaponization – with regard to space, refers to the operational deployment of weapons in space and on Earth that are capable of destroying or disrupting elements of adversary space systems.

[17] Weapons of mass destruction (WMD) – so-called ABC weapons – nuclear, biological, chemical, which are designed to strike objects on a massive scale (over large areas). See: V. W. Sidel, B. S. Levy, *Weapons of Mass Destruction* [w:] *International Encyclopedia of Public Health,* 2017, p. 402–407 (DOI:10.1016/B978-0-12-803678-5.00491-4.

[18] Completely demilitarized objects are the Moon, celestial bodies and their orbits.

ABSTRAKT:

PL: W artykule dokonano analizy porównawczej dwóch współczesnych strategii kosmicznych opublikowanych przez Wielką Brytanię i Francję. W odniesieniu do pierwszej z nich określono wizję oraz cele strategiczne. W następnej kolejności opisano realizację określonych celów za pomocą czterech filarów. Opisano 4 fazy wdrażania strategii, z horyzontem czasowym po 2030 roku. W odniesieniu do francuskiego odpowiednika strategicznego określono wagę przestrzeni kosmicznej we współczesnych działaniach militarnych, jak również wskazano na ramy prawne militarnych i niemilitarnych działań w Kosmosie. Kolejna część publikacji traktuje o kierunki rozwoju oraz nabywane w przyszłości zdolności kosmiczne. Za istotne uznano zwiększenie autonomii strategicznej, której czynnikami są: prawo, aspekty techniczne oraz współpraca międzynarodowa. Opisano mapę drogową, określając francuskie ambicje w rozwoju tego obszaru operacyjnego. W ostatniej części odniesiono się do kwestii strukturalnych związanych z nabywaniem zdolności kosmicznych. Dokonano porównania najważniejszych elementów strukturalnych obydwóch strategii: wizje i cele strategiczne, sposoby osiągania celów strategicznych, aspekty międzynarodowego prawa kosmicznego, etapy realizacji zadań określonych w strategiach, analizę i identyfikację zagrożeń oraz ambicje dotyczące osiągnięcia statutu supermocarstwa kosmicznego. Wskazano różnice oraz części wspólne poruszanych elementów strukturalnych dokumentów.

ENG: The paper presents a comparative analysis of two contemporary space strategies published by the United Kingdom and France. In respect to the first one, the vision and strategic objectives have been defined. This is followed by a description of the achievement of defined objectives through four pillars. Four phases of strategy implementation were outlined, with a time horizon after 2030. With reference to the French strategic counterpart, the importance of space in modern military activities was defined, as well as the legal framework for military and non-military activities in space was indicated. The next part is devoted to the development directions and future acquisition of space capabilities. An increase in strategic autonomy, the factors of which include law, technical aspects and international cooperation, was considered important. A roadmap was described, defining French ambitions in the development of this operational area. The final section addresses structural issues related to the acquisition of space capabilities. A comparison was made between the most important structural elements of two strategies: visions and strategic objectives, ways to achieve the strategic objectives, aspects of international space law, stages to achieve the tasks defined in the strategies, analysis and identification of threats, and ambitions to achieve space superpower status. The differences and common parts of the addressed structural elements of documents were indicated.

SŁOWA KLUCZOWE:

PL: kosmos, bezpieczeństwo, bezpieczeństwo narodowe, strategia

ENG: space, security, national security, strategy