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Criminal jurisdiction in outer space in multi-module space objects. An outline of the problem

Jurysdykcja karna w przestrzeni kosmicznej w wielomodułowych obiektach kosmicznych. Zarys problematyki

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Abstract: This article is focused on criminal jurisdiction in space in relation to multi-modular objects launched into it. The purpose of the considerations is to present contentious situations in space that are lacking in adequate legal regulation and to propose possible solutions to the problem. The study of this aspect has a fundamental impact on the development of international space law and also allows for precise and, above all, effective enforcement. In his considerations, the author presents a methodology of classification of crimes in space and also indicates, by citing an examplary situation based on the registration issue, that new multi-modular objects created by the amalgamation/merger of separately registered objects, may cause difficulties in the attribution of responsibility and enforcement of possible criminal acts. The paper uses comparative, deductive, historical-legal and individual case methods. The findings of the analyses confirm that the precision of defining certain aspects is insufficient and there are deficiencies occurring in the Registration Convention, which necessitates updating the Convention's provisions. Therefore, probably the most effective method is to use potentially optimal solutions focusing on the application of reasoning by analogy in the context of the laws in force on Earth, e.g. the Law of the Sea, the Antarctic Treaty.

Keywords: outer space, criminal jurisdiction, multi-modular objects, registration, liability

Abstrakt: Problematyka artykułu skupia się na jurysdykcji karnej w przestrzeni kosmicznej w odniesieniu do wielomodułowych obiektów wypuszczonych w przestrzeń kosmiczną. Celem podjętej tematyki jest wyodrębnienie sytuacji spornych w kosmosie, które nie mają odpowiedniego uregulowania prawnego i zaprezentowanie możliwych rozwiązań problemu. Badanie tego aspektu ma fundamentalny wpływ na rozwój międzynarodowego prawa kosmicznego, a także pozwala na precyzyjną i przede wszystkim skuteczną egzekucję. W swoich rozważaniach autor przedstawia metodykę klasyfikacji przestępstw w kosmosie, a także wskazuje, poprzez przytoczenie przykładowej sytuacji opierającej się na problematyce rejestracji, iż wielomodułowe obiekty powstałe w wyniku scalenia/fuzji osobno zarejestrowanych obiektów mogą powodować trudności z przypisaniem odpowiedzialności i egzekucją ewentualnych czynów zabronionych. W pracy zastosowano metodę komparatystyczną, dedukcyjną, historyczno-prawną i indywidualnych przypadków. Wynikiem przeprowadzonych analiz stwierdzono niewystarczającą precyzję definiowania pewnych aspektów oraz braki występujące przede wszystkim w konwencji o rejestracji w zakresie opisywanym w treści artykułu, co wyraża konieczność aktualizacji jej przepisów. W związku z tym prawdopodobnie najskuteczniejszą metodą jest zastosowanie poglądowych rozwiązań skupiających się na zastosowaniu wnioskowania przez analogię w kontekście przepisów obowiązujących na Ziemi tj. Prawo Morza, Traktat Antarktyczny.

Słowa kluczowe: przestrzeń kosmiczna, jurysdykcja karna, wielomodułowe obiekty, rejestracja, odpowiedzialność

1. Introduction

The issue of criminal jurisdiction in outer space raises many controversies, many questions, many doubts. This situation results from uncertainty regarding the classification of possible crimes, differences in reasoning by individual states, as well as imperfections in the regulations governing outer space. Individual sets of norms do not directly address the issue of criminal liability for prohibited acts or omissions, and moreover, they do not include any catalogue of sanctions that could resolve controversial situations. Due to the increasing human activity in outer space, new threats are emerging, which are not described at all or are described to a very limited extent in the available sources of international space law. A good example of the issue is the matter of registering objects launched into space. Due to the increasing technological progress in recent years, and especially in space technology, the aspect of creating multi-module objects as a result of the fusion of single objects is of particular importance. The existing solutions do not address this issue, therefore it is necessary to conduct appropriate research and analyses that could support finding a solution. However, it should be taken into account that currently any new solutions concerning space are implemented with a significant delay, or not implemented at all. In addition, projects often are quickly abandoned. Therefore, a much better option

may be to use available solutions found on Earth through a comparative and deductive interpretation.

2. The need for changes in international space law

The exploration of outer space, as well as of celestial bodies has been for many decades a kind of "one actor theatre", where mainly individual highly-developed states held a monopoly over space activities (Grochalski, Szewczyk 2023: 32). Nowadays, increasingly, the aspect of activities goes beyond the typical framework of a single state. States, have enabled multi-actorism to occur, which is a kind of *signum temporis*. Nowadays we may observe a development in this regard: apart from states exploring space, there are also international organizations (Grochalski 2009: 295-311), individuals and legal entities who are present there with their objects.

The large number of manned space flights in the not so distant future would mean that people confined in cramped quarters for a significantly long period of time will experience many behavioral problems that may affect the crew (Ohmer 2019: 370). In this context, the principles contained in international space treaties and agreements become inadequate in many respects, as they do not provide a clear, exhaustive and often even legitimate set of norms delimiting the collision of state jurisdictions (Grochalski, Szewczyk 2023: 40).

This is primarily due to the fact that the initial space activities, as well as all intentions of exploration and exploitation, were carried out by the superpowers of the time (mainly the United States and the Soviet Union), through the establishment of space agencies acting on behalf of the governments of the states, such as the National Aeronautics and Space Administration (hereafter: NASA), the European Space Agency (hereafter: ESA), the United Nations Office for Outer Space Affairs (hereafter: UNOOSA), or the now defunct Soviet Space Program. Nevertheless, it should be noted that the text of Article VI of the 27 January 1967 Outer Space Treaty (hereafter: OST) states that both international organizations and the States Parties will be liable for violations of the OST. As to the nature of this liability, it is joint and several, so that both the States and the international organizations are jointly liable to the aggrieved State, but there is no rule in a multi-stakeholder situation relating to the "sharing" of liability, or execution-sanctions, resulting from the commission of wrongful acts, between the responsible States and international organizations (Kelemen 2023: 50).

3. The issue of criminal jurisdiction in outer space – an overview

The exercise of criminal jurisdiction in space in relation to states bearing responsibility for acts, and potentially other actors, faces a first fundamental

problem based on the fact that various types of legal disputes may arise in this vast space, spanning more than just penal issues. With regard to the key issues to the discussed subject, it would be appropriate to recall the position of S. Gorove who outlined crucial zones occurring in space in which crime may occur:

1) in the vacuum/abyss (outer space *sensu largo*);

2) on board a spacecraft, in a space laboratory or other such facility in space;

3) on a spacecraft or celestial body;

4) on a celestial body, but not on board, inside or outside an object (Gorove 1972: 313-323).

The concept of crime itself also requires clarification. In this aspect, it must be noted that it should not be limited solely to classical, occurring on Earth, prohibited acts against human life and health. This concept also covers acts concerning other spheres, e.g. economic (crime of extracting space resources), military (for example, placing and using nuclear weapons), or environmental (destruction of a space body or pollution of the space environment) (Soroka 2023: 71).

When classifying crimes in individual countries, an important element is that the diversity or discrepancy in the classification of offenses may lead to possible disputes between states at the stage of creating law, due to the lack of a uniform view regarding the qualification of prohibited acts. Even conventional and diverse definitions of crime do not always apply in relation to outer space. This state of affairs results primarily from the fact that the provisions defining incriminating acts are developed and enforced in a diverse manner in state legal systems (Lampkin, White 2023: 4).

A kind of concrete legislative action taking into account the difficulties outlined is the example of the 2022 action, in which the Canadian Parliament passed an amendment to the country's Criminal Code to enable prosecution of crimes committed on the Moon. This is in line with the previous legislation that extended its jurisdiction over criminal acts committed by Canadian astronauts during space travel to the International Space Station (Lampkin, White 2023: 4).

Liability on the International Space Station (hereafter: ISS) stems from the existing agreement called International Space Station Intergovernmental Agreement (hereafter: IGA), which was set out in the 1998. It was based on a system of criminal law that empowers a state to try its own offenders. In doing so, it should be noted that the provisions only apply to citizens of partner states covered by the intergovernmental agreement. Third-country citizens being on board the ISS are subject to the general rules of jurisdiction set out in Article

VIII of the OST. Accordingly, if such persons commit an offence on board the ISS, they are subject to the jurisdiction of the state that registered the space object in question. It should be emphasized that the IGA does not apply to anyone outside the ISS, as it does not cover persons who are not engaged "at any stage of the (space station) flight". The above arrangement also applies to those who have temporarily descended from the ISS (White 2021: 351).

In terms of criminal jurisdiction, an element that needs to be taken into account is that application of different criminal codes to people who live and work in the same spatial environment seems inherently 'inconvenient', as some acts may simply not be defined as crimes occurring in the partner states. It is even more likely that the envisaged penalties may differ significantly. For example, if a Norwegian citizen goes berserk and kills the other five people on board the ISS (including one United States citizen) while they are gathered in a Russian module, the Russian Federation and all the victim partner states could claim jurisdiction precisely under the 1998 IGA (White 2021: 352).

4. Registration of multi-modular objects launched in space – a prescriptive approach

The issue of registering objects launched into space is extremely important today due to the rapid technological development and human pursuit of activities in space. Thanks to the inevitable creation of new ships, rockets, and shuttles that can transport humans into space, the probability of arising of controversial situations that cannot be resolved directly or even indirectly is increasing: the more manned objects visit outer space, the more creative solutions will occur. This will also raise other questions, one of the concerning the previously mentioned aspect of multi-module objects. Defining the problem accurately and finding a potential solution are essential not only for the development of international space law, but above all for resolving the issue of criminal jurisdiction and enforcement.

A characteristic element is that since the beginning of the 21st century the world has been confronted with a ground-breaking increase in the number of private companies specializing in space travel, e.g. PD Aerospace, Blue Origin or Sierra Space. The colonization of Mars is becoming an increasingly complex topic in debates. New, multi-modular spacecraft, or space objects, may become a reality in the future, entailing many new questions in terms of providing appropriate regulations. It should be noted that the first crucial, multi-module object operating in space to this day is the International Space Station which is regulated by the IGA of 1998. However, this set of articles refers strictly to the ISS (as well as to the partner states of the agreement and individual sources of

space law in terms of obligations and compliance). Therefore, it cannot be used as an example of solutions in the context of other multi-module objects. As a consequence the ISS does not have any real power to impose its legal will, leaving room for situations occurring outside its area. As a final result, the situation with regard to criminal jurisdiction in space becomes even more complicated.

After many years following the entry into force of the Convention on the Registration of Objects Launched into Outer Space, it is objectively appropriate (it seems) to assess the effectiveness of this international instrument, which is an important element for the global space governance. The main purpose of its creation was to provide a legal order that would be an effective response to the rapidly developing space activities of entities involved in the space sector (Jakhu, Jasani and McDowell 2018: 406).

The Convention requires registration of a "space object", but its definition has not been adequately specified. It only indicates that the object "includes the components of a space object, as well as its launch vehicle and its parts." Therefore, this concept is very broad (Jakhu, Jasani and McDowell 2018: 407). However, it is accepted on the basis of the assumptions of the Convention that this term should be understood as any physical or material object/device that is the work of man, regardless of its size, shape, composition and purpose (e.g. payloads, rockets, astronaut suits or satellites), and which has been launched into Earth orbit or beyond. In this sense, the term space object, as it has a broader scope, should also include multi-module objects (Jakhu, Jasani and McDowell 2018: 407). However, this is not, as it seems, clear to everyone. Some countries (such as the United States and France) interpret "space object" as including non-functional objects such as deserted/abandoned rocket stages and debris, while others (such as the Russian Federation) consider only payloads (Jakhu, Jasani and McDowell 2018: 407).

By reviewing the individual provisions contained in the Convention and making the appropriate interpretation, it can be concluded that registration applies to the launching state, or launching states, which, in accordance with the content of the preamble and the 1967 OST, have been assigned the status of an entity responsible for activities, including, by default, torts subject to potential criminal jurisdiction. On the basis of Article II which refers to the situation of several launching states, it is stated that "they shall jointly agree which of them shall register a given object in accordance with paragraph I of this article." Therefore, no norm is included, that would resolve the consequential effects of possible unification of many modules registered separately by each "launching state". The OST does indeed resolve the issue of liability in Articles VI-VIII. However, it also refers exclusively to the activities of each state separately ("States Parties to the Treaty").

The issue of registration of a space object does not focus solely on the responsibility of the launching state either. In this matter, there are also other possibilities that are subject to certain difficulties in unambiguous assessment (and at the same time, they show the oversights occurring on the part of the Convention). In principle, every launching state has to register a ship or space object. But what if a state decides to deregister such an object for various reasons?

It would seem that due to the simple approach to the possibility of registering any space object, there should be no problems with deregistration. After all, this is an activity that does not have a timeless dimension and has the possibility of applying analogous solutions occurring on Earth in the context of the applicable law of the sea and air law, where both sea vessels and aircraft machines are subject to an appropriate registration system. However, this issue has not been resolved in any way in the Convention on registration, which due to the nature of the document itself is a somewhat absurd element that encourages reflection. The dependencies occurring in the case of sea vessels and aircraft machines may apply (almost in full extent) to ships or space objects. This results from the fact that many phenomena (based mainly on the technical and functional aspect) that could occur, are identical. Any used spacecraft may be destroyed at any time, not be subject to repair, replacement, or even theoretically be sold to another country, which also applies to sea vessels and aircraft machines in the same way. It is therefore difficult to find any divergent elements here (Grochalski 2022: 101-102). The option of removing from the register is also not a standard requiring precise definition of the methods of its implementation as well, especially since many registers on Earth are equipped with this option. Therefore, the lack of possibility of deletion, or even "zeroing" the status of a ship or space object is certainly a serious oversight requiring a response from the states (Grochalski 2022: 102).

The above fact also leads to the creation of further questions concerning the occurrence of situations inconsistent with the applicable law, such as intrusion, capture or theft of a space object. The lack of solutions concerning the issue of deregistration of a spacecraft by a state creates conditions for their potential abandonment in a situation of reluctance to service the colloquial 'junk' or an object that, according to the state, is not suitable for further use, having fulfilled a specific role (e.g. research/scientific). This consequently leads to the fact that abandoned facilities make an easy target for potential criminals who will certainly want to appropriate or simply use such an object, especially if it is still functional. However, the threat becomes much greater when the abandoned object has military functionalities, is armed, or when confidential documents revealing important plans, activities, or goals have been left inside. Such a situation could

lead to a serious danger to other objects, people, and even the country to which the object belonged. In this case, the solution to the issue of liability in the event of committing a potential prohibited act is, in principle, impossible to determine at the moment. It is not certain, whether the fault should be attributed to the launching state, which according to the provisions of the Convention (regardless of the decisions taken regarding the object) is still its owner, or whether it should be attributed to the potential 'alien' who performed the capture, i.e. seized such a ship. Presumably, such an 'intruder' could also commit other subsequent offences, manifesting themselves through the previously mentioned use of the military properties of the seized object, or use it in a manner inconsistent with international space law. The conclusion from the above considerations is that the register of space objects maintained in accordance with the provisions of the Convention on Registration, should be updated, or expanded, to the level corresponding to the registration of terrestrial sea vessels and aircraft, so that the issue can be properly resolved (Grochalski 2022: 103).

5. Selected legal solutions resolving the issue of multi-modular objects

If we were to assume that the newly created multi-module ship or object (depending on the decision of the states) should maintain the same liability structure as in the case of separate modules, where the original affiliation of the module of the launching state defines its liability, the solution would appear much faster. However, this is not so obvious. Seeking the appropriate method requires constant consideration of many factors, including the actions/motives of the states concluding the agreement, based on which the multi-module object was created. It is possible for individual states to waive the right of ownership and for one state to take control of the object. This raises questions about the liability of this leading state, in terms of possible negative effects caused by modules that were not previously its property. Taking this into account, it is difficult to put forward an affirmative thesis regarding the issue of criminal liability.

A certain guideline resolving the jurisdictional issue in this aspect could be largely applied *per analogiam* to solutions concerning legal regulations of the open seas, the legal status of airspace over the open seas, legal solutions of the so-called "artificial islands", or the connection of space with regulations concerning the Antarctic (Grochalski, Szewczyk 2023: 34). At the same time, the starting point is that outer space, like the above-mentioned territories, is considered *res communis*, i.e. it belongs to everyone without exception. In this context, evidence can be found in Article 87 of the United Nations Convention

on the Law of the Sea of 10 December 1982 (hereafter: UNCLOS), which provides for the freedom of the open seas, as well as in Article 89 which eliminates the right of states to surrender their sovereignty. Also very important is Article 91 "concerning the conditions of nationality of ships, as well as the registration of ships in their territory" and Article 92 dealing with their status, where there is an obligation for a ship to sail "under the flag of only one state". The first of them sounds very similar to the content contained in the 1975 Registration Convention, focusing its differences mainly on the subject of registration. The second one is a kind of starting point for considerations concerning the definition of the form of liability in the event of the creation of the discussed multi-module objects. In a disputed situation, the application of the modified content for the needs of outer space, especially of point 2 of this article, could lead to the creation of a "ship without any nationality", which cannot "invoke any of these nationalities". This would mean that the states creating the multi-module object would have to either waive the right to their modules, transferring ownership of the whole to another state (analogy to point 1 of Article 92), or would have to act incognito in relation to other states, which is not a completely good solution, considering the intended purposes of its creation. In connection with this issue, it may also be necessary to resolve the previously mentioned issue of deregistration of facilities.

The aforementioned Antarctic Treaty of 1 December 1959 (hereafter: AT) has been very successful over the years of its existence. It has successfully dealt with the military challenges posed by nuclear weapons, political tensions related to claims of sovereignty and the desire of scientists to have joint access to research sites in vast, unexplored areas (Race 2011: 143). In addition, it has given rise to many analogous provisions governing outer space. This is due to the fact that outer space is a place with a similar 'purpose' to Antarctica. The wording of the key articles of the provisions governing outer space indicates *expressis verbis* that there has been a certain adaptation of the norms of the AT, which can already be observed in Article I AT, where a large part of the content has been almost duplicated, and especially the elements concerning the peaceful use of space. However, despite many similarities and similar priorities, the provisions concerning Antarctica and outer space respond to completely different challenges, both social and technological. As a result, their positions have diverged significantly over time, primarily in matters of environmental protection and management (Race 2011: 143). However, this does not change the fact that the Antarctic Treaty could offer some inspiration for the creation of the provisions governing outer space. It can also (despite different goals and individual priorities focus) be of help in resolving disputes regarding the jurisdictional aspect. If states really want to organize outer space together as

an international community, the example of cooperation in Antarctica seems to be quite accurate.

Although it is a *sine qua non* condition of national sovereignty that a state may exercise jurisdiction over all persons within its territory or territorial seas (Triggs 2011: 45), Article VIII AT limits jurisdiction over observers and scientific personnel and their personnel to the "Contracting Party" of which they are nationals. This means that when the specified groups of people of different nationalities are present in Antarctica, they will be subject to the jurisdiction of their own country, not any other ones. The liability of these persons (for example within the scope of the functions they undertake) will therefore be decided on the basis of their national law and not the law of another country, which they have nothing to do with. In practical terms, claimant states routinely limit the exercise of jurisdiction over acts and persons within their Antarctic territories to their own citizens and refrain from applying national laws to citizens of other states. The method of the traditional jurisdictional reach limitation of the territorial state has successfully secured avoidance of conflicts over sovereignty and has enabled cooperation on the main goals of Antarctic science. In this regard, liability regulations could be a potential tool for shaping the resolution of some conflicts in outer space (Triggs 2011: 45). For example, the indicated provisions could serve as an analogy in the event of a problem with assigning responsibility to scientific personnel or other persons performing their tasks/functions in a multi-module facility, or even in the case of future, possible activity on the surface of, e.g., Mars or another celestial body. The situation described in the article of the connection of multiple separately registered modules can be compared to the situation of observers, scientists, and the continent itself. Each module, being separate, is subject to the jurisdiction of the sending state (like an observer in Antarctica), while in the event of the modules uniting, a new 'continent' (so to speak) is created, where jurisdiction could be exercised analogously with respect to its elements. Despite the connection, each state could continue to exercise jurisdiction, but only in a limited way. Thanks to this, potential cooperation on the newly created multi-module facility could be conducted safely and prevent potential collisions.

6. Conclusion

Criminal jurisdiction in outer space, taking into account all the circumstances presented in the article and the approach of States in the development of international space law in recent years, still requires appropriate regulating. The differences between individual countries in interpreting, classifying and defining specific criminal acts, make it difficult to adapt space law to the con-

ditions prevailing on Earth. In this situation, a risk of legal conflicts has been identified and also a possibility of conflicts of international interests. Due to the constant technological progress and human interest in exploration and exploitation of space, it is necessary to take action that is both quick and effective. The implementation of this assumption, in accordance with the cited content is possible by creating solutions resulting from the use of primarily comparative, deductive and individual case methods. The indicated case of the creation of new, multi-module objects, the issue of registration, or the unresolved element of the procedure for deregistering objects clearly indicate that thanks to the available solutions in force on Earth, in the form of the Antarctic Treaty or the Convention on the Law of the Sea, it is possible to find an analogy necessary to resolve not only the issues raised, but also, perhaps in the future, to create a set of norms allowing for the execution-sanction of prohibited acts. In addition to the indicated international legal acts, an effective solution to the problem of multi-module facilities, based on the conducted research, could be to invoke the jurisdictional ability of national governments. This jurisdiction would be executed both in national courts and international bodies. Unfortunately, it turns out that the existing regulations create many doubts in this area and even binding, multilateral international agreements have not led to their clarification (Firouzfar, Javid 2023: 22). As a result of the analysis of the presented solutions, it was proven that it is possible to bring international space law to potential completeness and that the research objectives focused on resolving the existing jurisdictional ambiguities can be eliminated.

Abbreviations

NASA – The National Aeronautics and Space Administration
ESA – European Space Agency
UNOOSA – United Nations Office for Outer Space Affairs
OST – Outer Space Treaty
ISS – International Space Station
IGA – Intergovernmental Agreement
UNCLOS – United Nations Convention on the Law of the Sea
AT – Antarctic Treaty

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