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FROM THE SECTORAL ANGLE TO THE GENERAL RULES OR HOW THE CONVENTION ON INTERNATIONAL LIABILITY FOR DAMAGES CAUSED BY SPACE OBJECTS[1] INFLUENCED THE DEVELOPMENT OF THE INTERNATIONAL LAW OF STATE RESPONSIBILITY AND LIABILITY?

Abstract

This article discusses the impact the 1972 Liability Convention exerted upon the further discussion on state responsibility and liability rules within the UN International Law Commission. The question it seeks to answer is the issue of how, and to what extent, its provisions influenced the development of international law on the responsibility of states and international organizations and the institution of international liability of states. Most notably, the present article demonstrates how the Liability Convention served as a reference point for the International Law Commission's works struggling to codify the general rules of states' liability. It also examines the factors that, from the mid-1990s onward, have steadily diminished its role in the ongoing debate and how it finally informed the final shape of the 2006 *Draft principles on the allocation of loss in the case of transboundary harm arising from hazardous activities*. Furthermore, it analyses the

[1] Convention on International Liability for Damages Caused by Space Objects, 29 March 1972, in force from 1 September 1972, 961 UNTS 187 (hereinafter: Liability Convention or simply Convention).

2001 Articles on Responsibility of States for Internationally Wrongful Acts (ARSIWA) and the 2011 Articles on Responsibility of International Organizations (ARIO). With this in mind, it is put forward that the differences mandate strict differentiation between international responsibility and international liability at the theoretical level. Nonetheless, the Liability Convention could furnish patterns based on which, notably, the institution of joint and several responsibility of states and international organizations, respectively, have been modelled.

Therefore, it is concluded that the *lex specialis* and the self-contained character of the regime established under this Convention effectively limit its impact on the development of international regimes of responsibility and liability of states and international organizations. However, they do not eliminate them altogether. Ironically, in practical terms, the Convention marked the 2001 ARSIWA and, indirectly, the 2011 ARIO more decisively than the 2006 Draft Principles, even though the Convention – similar to the DP 2006 – addresses states' liability, not their responsibility.

KEYWORDS

liability of states, responsibility of states, Liability Convention, outer space, space objects.

SŁOWA KLUCZOWE

odpowiedzialność państw, Konwencja o odpowiedzialności państw za szkody wyrządzone przez obiekty kosmiczne, przestrzeń kosmiczna, obiekty kosmiczne.

1. INTRODUCTION

The 50th anniversary of the entry into force of the Liability Convention gives good food for thought on its significance for developing international law theory and practice. Undoubtedly, the number of reported cases that arose under its provisions is not particularly impressive, and neither is its ratification status.[2]

[2] According to the Committee on the Peaceful Uses of Outer Space, as of 28 March 2022, 98 Sates taken altogether agreed to be bound by this treaty. 4 other states deposited the declarations of acceptance of rights and obligations (See Committee on the Peaceful Uses of Outer Space. Legal Subcommittee, *Status of International Agreements relating to activities in outer space as at 1 January 2022*, A/AC.105/C.2/2022/CRP.10 (accessed 1 March 2023, https://www.unoosa.org/res/oosadoc/data/documents/2022/aac_105c_22022crp/aac_105c_22022crp_10_0_html/AAC105_C2_2022_CRP10E.pdf).

Therefore, its direct effect on international outer space practice development is not apparent.[3]

Still, in the current research, little attention has been paid to the more subtle and indirect impact the Convention could have exerted on the law of international responsibility and liability of states and international organizations.[4] Nonetheless, during the negotiations preceding the adoption of the ARSIWA and ARIO and 2006 Draft Principles, respectively,[5] it served several years as a vital reference point for Special Rapporteurs. It was also invoked during the discussion at the ILC meetings, and it could inform the final shape of the draft articles mentioned above. Therefore, the primary goal here is to determine whether (and if so, to what extent) the Convention influenced the UN International Law Commission's[6] works on the institution of responsibility and liability in international law and – in this way – to fill these lacunae.

The present contribution is divided into three parts. Part I restates the Liability Convention's provisions most frequently invoked in the international responsibility and liability debate. It also lists the most important legal acts regulating states' and IOs' responsibility and liability in international law. It also touches upon the milestones in the development of these institutions. Part II discusses the role of the Liability Convention in the works of the ILC on state liability. It also examines the issue of the influence of provisions of this Convention exerted upon the final shape of the 2006 Draft Principles. Part III addresses the same issues concerning

[3] Setting aside the famous old instance Cosmos 954, which sparked many controversies in the literature, it would be rather tricky to indicate other cases where Article II of the Convention was invoked. (For more on this incident and the legal effects it produced see J. Burke, *Convention on International Liability for Damage Caused by Space Objects: Definition and Determination of Damages After the Cosmos 954 Incident*, 'Fordham International Law Journal' 1984, No. 8(2); B.A. Hurwitz, *State Liability for Outer Space Activities in Accordance with the 1972 Convention on International Liability for Damages Caused by Space Objects,* Dordrecht/Boston/London/the Netherlands 1992. For recent and critical comments concerning the interpretation of this incident, see G. Laganière, *Liability for Transboundary Pollution at the Intersection of Public and Private International Law,* London 2022, p. 31.

[4] Hereinafter: IOs

[5] Responsibility of States for Internationally Wrongful Acts, A/CN.4/SER.A/2001/Add.1 (Part 2). Yearbook of the International Law Commission 2001, Vol. II (Part Two) Report of the Commission to the General Assembly on the work of its fifty-third session, UN, New York and Geneva 2007, p. 26 (hereinafter: ARSIWA); Draft principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities 2006, A/CN.4/SER.A/2006/Add.1 (Part 2). Yearbook of the International Law Commission 2006, Vol II, Part Two, Report of the Commission to the General Assembly on the work of its fifty-eighth session, United Nations, New York and Geneva 2013, p. 58 (hereinafter: 2006 Draft Principles); Draft articles on the responsibility of international organizations 2011, CN.4/SER.A/2011/Add.1 (Part 2). Yearbook of the International Law Commission 2011, Vol. II, Part Two, Report of the Commission to the General Assembly on the work of its fifty-eighth session, United Nations, New York/Geneva 2018, p. 40 (hereinafter: ARIO).

[6] Hereinafter: "the ILC" or simply "the Commission".

the origins and the outcome of the ILC's works on the responsibility of states and international organizations. In the conclusions, I claim that the place the Liability Convention occupied on the list of the ILC reference points has changed over time. Moreover, for the reasons discussed below, the Convention's impact on the liability and responsibility regimes elaborated by the ILC has been unequal and somewhat pretty limited. Nonetheless, some concrete legacies or traces this Convention left on the ARSIWA, ARIO, and the 2006 Draft Principles are easy to detect. Thus, despite its *lex specialis* character, the Liability Convention could inform the ILC's work on the general regime of IOs' and states' responsibility and liability, even though this effect could have appeared to a limited extent only.

PART I

This discussion does not aim to comment extensively on the provisions of the Liability Convention, as its content has already been discussed elsewhere.[7] Nonetheless, legal scholars commonly agree that one of its main features is the absolute liability[8] for any damage caused to states and their residents by a space object on the Earth's surface and to an aircraft in flight.[9]

As Foster notes, it was *the first time that an international agreement has sought to impose such a liability regime on states in their capacity as states*.[10] Moreover, under the system established under the Convention, no State-Party to it may avoid liability for damages resulting from outer space activities, even if the latter are carried out not by its organs but by private companies.[11]

Furthermore, in the light of Articles IV and V of the Convention, states can bear liability severally and jointly for damage caused to a third state or its nation-

[7] See most notably: W.F. Foster, *The Convention on International Liability for Damage Caused by Space Objects*, 'Canadian Yearbook of International Law' 1972, No. 10 p. 137; B.A. Hurwitz, 1992, *op. cit*., pp. 9-82; M. Forteau, *Space Law,* (in:) J. Crawford , A. Pellet, S. Olleson, K. Parlett (eds), *The Law of International Responsibility,* Oxford 2010, p. 905.

[8] It is true that Article VI(1) of the Convention states that a launching state can exonerate its liability if *damage has resulted either wholly or partially from gross negligence or from an act or omission done with intent to cause damage on the part of a claimant State or of natural or juridical persons it represents*. Still, even if the prevailing opinion that the Liability Convention introduces absolute liability for the state liable for damage is not totally correct, it is nonetheless very close to the truth.

[9] See Article II of the Convention. For more on the issue see W.F. Foster, 1972, *op. cit*., p. 150; M. Forteau, 2010, *op. cit*., p. 903.

[10] W.F. Foster, 1972, *op. cit*., p. 150. As it was to appear later, this first time turned out to be the last one, which made the ILC's works on states liability much more complicated (see the next chapter).

[11] B.A. Hurwitz, 1992, *op. cit*., p. 48.

als.[12] One should also never forget that Article XI(1) deliberately omits the local remedy rule as the precondition which must be met before any State will acquire the right to lodge a claim against another State on behalf of the victims or their relatives.[13] As Hurwitz correctly notes, the Convention introduces a modified version of the diplomatic protection for nationals with all inconveniences such a system entails for individuals seeking efficient redress against the damage they have incurred.[14] Therefore, Article XI introduces an innovative approach by granting individuals the right to lodge their claims against the launching states before the domestic judiciary of those states.[15] This procedure is optional by allowing an individual to seek compensation through the domestic judiciary channels of the launching state liable for damage caused to the claimant. Ultimately, it is up to the injured persons to decide whether to trigger this clause or seek compensation through traditional diplomatic channels.[16]

Last but not least, Article XXII of the Convention also deserves a mention here. Although under its final clauses (Articles XXIII – XXVII) no accession of an international organization is possible, the Convention can produce its effects on damage resulting from activities undertaken by such an organization in outer space if the conditions laid down in Article XXII are met. In practical terms, in the case of damage caused for which an IO could be liable, this IO is held liable severally and jointly with its member states if the specific conditions are met.[17]

The general outline of the development of the law of international responsibility was also discussed elsewhere.[18] Although the ILC began its work on this topic in the mid-1950s, it was not completed until 2001.[19] In the context of the present analysis, it is worth noting that initially, the ILC considered the damage as a necessary premise entailing any state responsibility, be it for acts prohibited by international law or for acts permissible under it. By the late 1960s, the ILC had changed this attitude. Deleting the damage from the list of premises condi-

[12] As Hurwitz observed, Article V was not a novelty, as the institution of joint and several liability had been known to some other international agreements predating the 1972 Convention. B.A. Hurwitz, 1992, *op. cit*., p. 38.

[13] B.A. Hurwitz, 1992, *op. cit*., p. 52.

[14] *Ibid.,* p. 49 ff.

[15] *Ibid.,* p. 52 ff.

[16] As demonstrated in Part II, the procedures securing the efficient measure for victims to get compensated for damage originating from another jurisdiction were pivotal in the intellectual shift in the second half of the 1990s to the state liability problem.

[17] These are the following: (a) any claim for compensation in respect of such damage shall be first presented to the organization; (b) only where the organization has not paid, within a period of six months, any sum agreed or determined to be due as compensation for such damage, may the claimant State invoke the liability of the members which are States Parties to this Convention for the payment of that sum (see Article XXII(3)).

[18] J. Crawford, *State Responsibility. The General Part,* Cambridge/New York 2013 (see notably subchapter 1.4.1 pp. 35-37 concerning the works of the ILC).

[19] *Ibid.*

tioning the responsibility of states for wrongful acts,[20] the Commission opened the door to the delineation between their responsibility and liability, where the latter entails reparation for injuries caused by acts not prohibited by international law.[21] In hindsight, the opening for signature of the Liability Convention could have accelerated this trend in international legal thought. In any case, just a year later, the ILC noted that *the Commission fully recognizes the importance, not only of questions relating to responsibility for internationally wrongful acts but also of those concerning liability for possible injurious consequences arising out of the performance of certain lawful activities; especially those which because of their nature give rise to certain risks. However, the Commission takes the view that questions in this latter category should not be dealt with jointly with those in the former category.*[22]

In 1978 the ILC established the Working Group to consider the topic of *International Liability for injurious consequences arising out of acts not prohibited by international law.*[23] From this year onwards, the Commission's works on codification and progressive development of responsibility and liability irrevocably took two different paths. As stated above, the ILC completed its works on the responsibility of states and IOs in 2001 and 2011, respectively, when ARSIWA and ARIO were adopted. The Commission's work on state liability took a different course, partially because this topic has particular importance in the context of rising environmental concerns.[24] Interestingly, as early as 1978, the ILC stated that although "*it would not be appropriate in this report to try to survey the range of recent materials that are or may be, relevant to the development of the new topic*, it included, among other things, *measures of international co-operation*

[20] This provision states that *every internationally wrongful act of a State entails the international responsibility of that State.* A. Pellet, *The ILC's Articles on State Responsibility for Internationally Wrongful Acts and Related Texts,* (in:) J. Crawford, A. Pellet, S. Olleson, K. Parlett (eds), *The Law of International Responsibility,* Oxford 2010, p. 77.

[21] For more on the misconceptions deriving from this terminology see A. Boyle, *Liability for Injurious Consequences of Acts Not Prohibited by International Law,* (in:) J. Crawford , A. Pellet, S. Olleson, K. Parlett (eds), *The Law of International Responsibility,* Oxford 2010, p. 95 ff.

[22] See A/9010/Rev.1 Report of the International Law Commission on the work of its twenty-fifth session, 7 May – 13 July 1973, Official Records of the General Assembly, Twenty-eighth session, Supplement No 10. Extract from the Yearbook of the International Law Commission 1973, Vol. II, p. 169, para. 38.

[23] A/33/10. Report of the International Law Commission on the work of its thirtieth session, 8 May – 28 July 1978, Official Records of the General Assembly, Thirty-third session, Supplement No. 10. Extract from the Yearbook of the International Law Commission 1978, Vol. II (Part 2), p. 6, para. 9

[24] *Ibid*., (see Annex, Report of the Working Group on international liability for injurious consequences arising out of acts not prohibited by international law, p. 151, paras 14 and 18). See also A/35/10. Report of the International Law Commission on the work of its thirty-second session, 5 May – 25 July 1980, Official Records of the General Assembly, Thirty-fifth session, Supplement No. 10. Extract from the Yearbook of the International Law Commission 1980, Vol. II (2), p. 159, para. 132.

undertaken in relation to (...) regime of outer space[25] on the list of such materials. Thus, it was decided from the outset that the international law of outer space and – more importantly – the Liability Convention would play a significant role in the ILC's future works on state liability. In 1997, however, after almost 19 years of difficult discussions within the Commission, the ILC divided the topic into two parts. From then on, the Commission discussed the issue of prevention separately.[26] In effect, two Draft Principles were elaborated by the ILC, the first concerning prevention,[27] and the latter focused on states' liability.[28]

Parallel to the ongoing works of the ILC on responsibility and liability, states adopted many sectoral agreements imposing the liability for damages caused by some specific acts not prohibited by international law. The Convention is one of them, but it has never been an isolated case. Moreover, its provisions relied heavily on the 1967 Outer Space Treaty and the so-called "Nuclear Treaties" regulating liability for damages caused by nuclear accidents.[29] Later on, after 1972, states have concluded many other similar treaties.[30]

Against this backdrop, it is noteworthy that the ILC's draft articles and draft principles mentioned above are composed of general rules or principles that determine some basic standards of states or IO responsibility and liability. Therefore they are without prejudice to the treaties mentioned above, as they seek to go beyond the sectoral dimensions imposed on states by such agreements as e.g. the Nuclear Treaties or the Liability Convention. Besides, none of the articles

[25] A/33/10, p. 150, para. 12.

[26] A/CN.4/479, sect. C, A/CN.4/481 and Add.l,1 A/CN.4/L.536. International liability for injurious consequences arising out of acts not prohibited by international law, A/CN.4/SER.A/1997. Yearbook of the International Law Commission 1997, Vol. I, Summary records of the meetings of the forty-ninth session, 12 May-18 July 1997, UN, Geneva, November 1999, p. 155, para. 71.

[27] Draft Articles on Prevention of Transboundary Harm from Hazardous Activities. A/CN.4/SER.A/2001/Add.1 (Part 2). Yearbook of the International Law Commission 2001, Vol II, Part Two, Report of the Commission to the General Assembly on the work of its fifty-third session, United Nations, New York/Geneva 2007, pp. 146-148.

[28] 2006 Draft Principles.

[29] B.A. Hurwitz, 1992, *op. cit*., p. 27 ff., claims Article II of the Liability Convention should be interpreted as the outcome of the inspiration derived from two sources. On the one hand, these were the Outer Space Treaty's Articles VI and VII, because both these provisions introduced – as general principles – the responsibility and liability of states for damage resulting from activities carried out in outer space. On the other hand, some conventional liability regimes that had predated 1972, notably the "Nuclear Treaties" adopted in the early sixties, could have informed the Liability Convention's drafters (the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy (951 UNTS 264), the 1962 Convention on the Liability of Operators of Nuclear Ships (not yet in force, 'American Journal of International Law' 1963, No. 57(1)) and the 1963 Vienna Convention on Civil Liability for Nuclear Damage (1063 UNTS 265)). Also Hurwitz's argument, the terminology of the 1972 Convention (notably the definition of "damage") was at least partially modeled upon the 1960 Convention (see B.A. Hurwitz, 1992, *op. cit*., p. 13) is convincing.

[30] See e.g. Convention on Civil Liability for Damages Resulting from Activities Dangerous to Environment (1993, not yet in force, ETS, No. 150);

mentioned above (the ARSIWA, the ARIO, and the 2006 Draft Principles) are legally binding upon states, even though assuredly, the ARSIWA reflects (to a large extent) international customary law. However, the same is not true of the 2006 Draft Articles, which seem to incorporate progressive and future-oriented tendencies in the current trends in international law.[31]

The liability treaties mentioned above were usually opened for signature many years before 2001, decades before the ILC's work on the responsibility of states was eventually completed. Therefore, during the discussions within the Commission on state liability and responsibility, they were given due attention by the Special Rapporteurs and other ILC Members. As one of these agreements is the Liability Convention, it is the analysis of its impact upon these discussions on the state liability regime eventually laid down in the 2006 Draft Principles we must turn to now.

PART II

When one looks at the text of the 2006 Draft Principles, the first impression is that it was probably not influenced by the Liability Convention, and if so, to a limited extent only. Still, this issue appears more complex at closer examination, notably when exploring the ILC's preparatory work history in-depth.

As Hurwitz notes, from 1970 onward, the topic of *"International Liability for Injurious Consequences Arising Out of Acts not prohibited by International Law"* has been on the ILC's agenda[32]. Still, its anchorage on the list of the ILC's priorities was never solid, as the concept of state liability, from the outset, has been considered controversial.[33] Thus, at the early stage of its work on this topic,

[31] K. Schmalenbach, *International Standards for National Environmental Liability Regimes*, (in:) P. Gailhofer, D. Krebs, A. Proelss, K. Schmalenbach, R. Verheyen (eds), *Corporate Liability for Transboundary Environmental Harm. An International and Transnational Perspective,* Springer Cham 2023, p. 155 ff.

[32] B.A. Hurwitz, 1992, *op. cit*., p. 146 quoting: Yearbook of the International Law Commission 1970, Vol. II, Documents of the twenty-second session including the report of the Commission to the General Assembly, UN, New York 1972, A/CN.4/SER.A/1970/Add.l, pp. 307-308, para. 74.

[33] As Boyle noted, *It remained unclear whether activities which caused transboundary harm were or were not prohibited in international law. Nor was it clear that the cases and precedents on which the Special Rapporteurs sought to rely really did support a concept of liability for acts not prohibited by international law rather than responsibility for breach of obligation* (A. Boyle, 2010, *op. cit*., p. 96). Many states and legal scholars believe the liability has been adequately dealt with in the ARSIWA (see A. Boyle, 2010, *op. cit*., p. 97). This skepticism has always been present among scholars, e.g. Reuter (B.A. Hurwitz, 1992, *op. cit*., p. 151). See also Evensen's opinion expressed during the session of the ILC: J. Evensen, Yearbook of the International Law Commission 1984, A/CN.4/SER.A/1984, p. 226, para. 27. For more recent positions see K. Schmalenbach, 2023, *op. cit*.; G. Laganière, 2022, *op. cit.* Moreover, in the 1980s, some governments (e.g. the USSR) considered this topic unnecessary, for when states wanted to regulate the liability for specific kind

the problem the ILC faced was to find some legal acts supporting the counter-argument against this mostly skeptical attitude. Against this backdrop, at first glance, the law of outer space seemed to offer a solid basis that made it at least plausible that the state liability concept was not of a purely hypothetical character. Most notably, it delivered the evidence that state liability could exist in international legal order, even if it had not emerged yet as a general rule or principle.[34] From this perspective, the Liability Convention's function was peculiar. Firstly, by replicating in its preamble the concept laid down in the preamble of the 1967 Outer Space Treaty,[35] it constituted visible proof that a state may be held internationally liable for damages it causes by its permissible acts. Secondly, and more importantly, the liability it incurs can be absolute.[36] This peculiar feature of the Convention allows an understanding of why in the 1980s, the Convention was often quoted as the *sui generis* parameter of delineation between "responsibility" and "liability," considered as two interrelated but separate legal concepts.[37] As the first Special Rapporteur Robert Quentin – Baxter observed: *The distinction is best illustrated by the archetypal conventional regime contained in the Convention on Damage caused by Space Objects (...),* because its Article 2 *establishes for the States parties a "primary" obligation to pay compensation for injurious consequences arising out of acts not prohibited by international law. By virtue of a "secondary" rule, failure of a State party to meet its liability to pay compen-*

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of damage they were free to do so with a treaty (B.A. Hurwitz, 1992, *op. cit*., pp. 155 and 178). The US position was also not supportive (*id.,* p. 157).

[34] R. Quentin–Baxter, Preliminary report on international liability for injurious consequences arising out of acts not prohibited by international law, 1980, A/AC.4/344 and Add.1 and 2. Reprinted in A/CN.4/SER.A/1980/Add.l (Part 1). Yearbook of the International Law Commission 1980, Vol. II, Part One, Documents of the thirty-second session (excluding the report of the Commission to the General Assembly), New York 1982, see most notably p. 255 para. 28 (hereinafter: Preliminary report).

[35] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (from now on Outer Space Treaty), 27 January 1967, 610 UNTS 205.

[36] B.A. Hurwitz, 1992, *op. cit*., p. 10. This view was shared – among others – by the first Rapporteur Robert Quentin Baxter (see Preliminary report, p. 263, para. 56). During the 30 years of works on the 2006 Draft Principles some others ILC Members also saw the Liability Convention not as an isolated case but a reflection of a more general trend making states liable for any damage produced within the jurisdiction of other states (see e.g. the statement of the PRC's representative Ni from 1984 going in the same direction, Yearbook of the International Law Commission 1984, p. 207, para. 12).

[37] *The Special Rapporteur based his decision to accept the differentiation between "responsibility" and "liability" on a previous decision of the United Nations Committee on the Peaceful Uses of Outer Space to separate the two within the context of the 1967 Outer Space Treaty where, as will be recalled, Article VI deals with international responsibility, and Article VII deals with international liability for outer space activities* (B.A. Hurwitz, 1992, *op. cit*., p. 148, quoting Yearbook of the International Law Commission 1978, Vol. II, Part Two, p. 151, para. 178, and Preliminary report, para. 11).

sation constitutes a breach of an international obligation of that state, thereby entailing its international responsibility. (...) Obligations arising in respect of acts not prohibited are the product of particular "primary" rules: the violation of these or other "primary rules" brings into play the "secondary" rules of State responsibility for wrongful acts.[38]

This fragment and other excerpts from Quentin-Baxter Reports[39] prove that the Liability Convention was often quoted to persuade the skeptics that state liability had already attained "theoretical maturity," making it ripe for a codification effort. It allowed the ILC to continue its works against the strong opposition that had persisted until the very end of the Commission's proceedings.[40] Nonetheless, it is also true that in 1990s, the role of the Convention as a reference point furnishing inspiration to the ILC grappling with states' liability had met some objective and intransgressible limits. As a result, its utility for the Commission began to vanish. What were the factors that – step-by-step – eliminated the Convention from its previous function to an almost non-existing historical footnote unable to determine the 2006 Draft Principles' content more decisively? Numerous reasons explain this radical departure, but the most important are the following.

Firstly, the problem of state liability was added to the list of the ILC agenda primarily to answer the increasing environmental concerns.[41] Thus, the problem of prevention was equally important in the works of the Commission as the issue of liability. But as the former is mentioned only once in the preamble to the Liability Convention, it could barely inform the ILC on this issue.[42]

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[38] B.A. Hurwitz, 1992, *op. cit*., p. 149, quoting Preliminary report, para. 21.

[39] Cf. his opinions on relations between the duty of care and the liability of states. A/CN.4/346 and Add.1 & 2. Second report on international liability for injurious consequences arising out of acts not prohibited by international law, by Mr. Robert Q. Quentin-Baxter, Special Rapporteur. Extract from A/CN.4/SER.A/1981/Add. 1 (Part 1). Yearbook of the International Law Commission 1981, Vol. II (Part One). Documents of the thirty-third session (excluding the report of the Commission to the General Assembly), New York 1983, p. 123 para 90.

[40] Even in 2003 Sir Ian Brownlie or Allain Pellet attacked the topic as not ripe for codification A/CN.4/SER.A/2003. Yearbook of the International Law Commission. Summary records of the meetings of the fifty-fourth session, 5 May–6 June and 7 July–8 August 2003, UN, New York and Geneva 2009, p. 95 ff.

[41] See Report of the Working Group on international liability for injurious consequences arising out of acts not prohibited by international law, A/CN.4/SER.A/1978/Add. 1 (Part 2). Yearbook of the International Law Commission 1978, Vol II, Part Two, Report of the Commission to the General Assembly on the work of its thirtieth session, New York 1979, Chapter VIII (Other Conclusions and Decisions of the Commission), A/CN.4/SER.A/1978/Add. 1 (Part 2), Annex, p. 150, para. 10.

[42] B.A. Hurwitz, 1992, *op. cit*., pp. 32 and 68. As it is generally acknowledged, just because the Convention is silent on environmental matters, it does not apply to every case arising under a collision of debris with a space object. For more on this issue see e.g. P. Stubbe, *State Accountability for Space Debris A Legal Study of Responsibility for Polluting the Space Environment and Liability for Damage Caused by Space Debris,* Leiden/Boston 2018, p. 418. See also E. Kisiel, *Law as an Instrument to Solve the Orbital Debris Problem,* 'Environmental Law' 2021, No. 51(1);

Secondly, states did not hurry to accept strict liability as laid down in Article II as the general rule of their future liability regime.[43] Some representatives argued that the solution of Article II should have been accepted only when effective prevention measures did not exist for some particularly hazardous activities.[44] Thus, such drastic consequences did not fit a commonplace situation where the damage results from a steady accumulation of pollution, which must attain a significant level to become harmful to life, health, property, or the environment.[45] Other representatives argued that the Liability Convention is unique in its character, and – for this reason – it could not serve as a model for further works of the ILC.[46] Thus, as the first Special Rapporteur, Owen Baxter, proposed extending the strict liability of states as a rule applicable to all cases arising under the future state liability regime, his proposal was received with visible reluctance and hesitations.[47]

G. Laganière, 2022, *op. cit*., p. 31. But see Baxter's general remark: *Sometimes, as in the case of damage caused by space objects, regulation can precede the development of the activity to which it relates* (A/CN.4/383 and Add.1. Fifth report on international liability for injurious consequences arising out of acts not prohibited by international law, by Mr. Robert Q. Quentin-Baxter, Special Rapporteur (Report published in: A/CN.4/SER.A/1984/Add.l (Part 1). Yearbook of the International Law Commission 1984, Vol. II (Part One), Documents of the thirty-sixth session, New York 1986, see p. 166, para. 29)). See also A/47/10. Report of the International Law Commission on the work of its forty-fourth session, 4 May – 24 July 1992, Official Records of the General Assembly, Forty-seventh session, Supplement No. 10. Extract from the Yearbook of the International Law Commission 1992, Vol. II(2), p. 43, para. 288.

[43] Although one should note here that this view was not shared by all states: cf. Koroma's statement in A/CN.4/SR.2018. Summary record of the 2018th meeting. Extract from the Yearbook of the International Law Commission 1987, Vol. I, p. 153, para. 25

[44] A/CN.4/SR.1686. Summary record of the 1686th meeting. Extract from the Yearbook of the International Law Commission 1981, Vol. I, p. 222, para. 8.

[45] As it is generally well known, 2006 Draft Principles are applicable only when the damage is "significant" (Cf. Article 2(a))

[46] A/CN.4/SR.1685. Summary record of the 1685th meeting. Extract from the Yearbook of the International Law Commission 1981, Vol. I, p. 217, para. 3. Cf. statement from the ILC Member Bernhard Graefrath, A/CN.4/SER.A/1987. Yearbook of the International Law Commission 1987, Vol. I., Summary records of the meetings of the thirty-ninth session, 4 May-17 July 1987, United Nations, New York 1989, p. 144, para. 31.

[47] A/42/10. Report of the International Law Commission on the work of its thirty-ninth session, 4 May – 17 July 1987, Official Records of the General Assembly, Forty-second session, Supplement No. 10. Extract from the Yearbook of the International Law Commission 1987, Vol. II (Part Two), p. 48, paras 181 and 182, and p. 52. It seems that this reluctance was persistent, although even in 1990 there were numerous states which were ready to support the view that a State should be in principle directly liable for any damage originating from its territory or areas under its jurisdiction (see A/45/10. Report of the International Law Commission on the work of its forty-second session, 1 May – 20 July 1990, Official Records of the General Assembly, Forty-fifth session, Supplement No. 10., 1990 Vol. II (Part Two), p. 100, para. 509). However, despite this pressure, most states did not depart from their previous positions on this proposal (*ibid*.). See also *ibid*., p. 103, para. 524.

Thirdly, and more importantly: after the end of the Cold War, a state's role in economic life decreased significantly. This factor also contributed to the ILC's loss of interest in seeking inspiration from the Liability Convention. As the Second Special Rapporteur Julio Barboza aptly put it, in the light of its provisions, *the state becomes the only actor relevant in the entire regime: (...).* That is, it *is absolutely liable if the damage is caused on the surface of the Earth or to aircraft in flight as well as liable for damage caused due to its fault to a space object of another launching State.*[48] The problem was that in the 1990s exploration of outer space appeared sufficiently profitable to attract private investors[49] and this shift entailed radical changes to ILC's previous attitude. As the general assumption that only State organs or state-controlled agencies undertook activities in outer space exploration was behind the curve, this shift entailed a change of perspective which until then had been dominated by a state-centric approach. Not coincidentally, in 2003, Zdzisław Galicki, the Polish representative in the ILC, argued that *the liability and obligation to compensate should be first placed at the doorstep of the person most in control of the activity at the time of the accident or incident occurred*.[50]

In essence, Galicki's opinion was not an entirely new one.[51] Still, his remark is interesting as it indirectly mirrored another shift that had taken place step-by-step within the Commission that concerned dispute settlement procedures applicable to cases engaging state liability. The Commission knew, of course, that the treaty practice predating the Liability Convention developed a model that channelled the liability for damage sustained to the operator of an installation.[52] What is more,

[48] A/49/10. Report of the International Law Commission on the work of its forty-sixth session, 2 May – 22 July 1994, Official Records of the General Assembly, Forty-ninth session, Supplement. Extract from the Yearbook of the International Law Commission 1994, Vol. II(2), p. 155, paras 366 and 367.

[49] In this vein: R.J. Lee, *The Liability Convention and Private Space Launch Service. Domestic Regulatory Responses,* 'Annals of Air & Space Law' 2006, No. 31(351), p. 352 ff.

[50] A/CN.4/SR.2765. Summary record of the 2765th meeting. Extract from the Yearbook of the International Law Commission 2003, Vol. 1, p. 99, para. 43. Galicki also thought that the Convention created a self-contained regime, and its norms were of an exceptional, not general, character. Therefore, he believed that the future rules on liability should focus on non-state actors' liability, *ibid*., para. 44.

[51] In the late 1980s already some ILC Members argued that the Convention *was drafted on the assumption that all future space activities would be carried out by States or under their control; that assumption did not exist in respect of the present topic. Absolute liability of States could not, therefore, be extended in respect of activities which were essentially private. The solution assigning sole liability to the operator also had drawbacks: for example, harm might be so substantial as to result in insolvency on the Part of the operator, thus leaving the victim without adequate compensation or even with no compensation at all.* See A/46/10 Report of the International Law Commission on the work of its forty-third session, 29 April – 19 July 1991, Official Records of the General Assembly, Forty-sixth session, Supplement No. 10. Extract from the Yearbook of the International Law Commission 1991, Vol. II (Part Two), p. 115, para. 239.

[52] As early as in 1978 the ILC Working Group noted that *It has become the practice of States to establish conventional regimes to regulate liability for these dangers, on a subject-by subject*

some Members of the ILC Commission believed such a construction of Liability Treaties was standard treaty practice. In this perspective, the Liability Convention, which openly recognized the direct liability of a state for damage caused by a lawful act (including the act of a private person as an act attributable to it), seemed to have been an exception, not a rule.[53] Compared to Article II, mentioned above, this new/old approach was significantly different, as the Convention made the launching state liable for any damage caused by the space object launched from its territory on the surface of another state. However, the new approach, which primarily drew back on the Nuclear Treaties, placed an originating State as the guarantor for payment of compensation rather than the subject principally liable.[54]

For all these reasons, by the mid-1990s at the latest, it had become clear that the Commission was no longer in a position to defend the Liability Convention as the key reference point in the discussion on the future attribution of liability between states and operators.[55] This change in the general approach resulted in differences between the Convention's regime and the 2006 Draft Principles, which have not been insignificant and should never be disregarded. To name but the most important: under Article II of the Convention, the launching state bears the strict liability, while it is never the case of damage arising under the 2006 Draft Principles.[56] Under the Liability Convention, a state is liable for any dam-

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basis. The regimes differ very widely in their content, which tends to be governed by the needs of the particular situation, rather than by any doctrinaire view about the nature of the responsibility of States. In some cases, a liability is accepted by States themselves; in others liability is placed solely on the operator, and remedies are made available within the ambit of municipal law. There are intermediate solutions, including some that place primary liability on the operator, but envisage a recourse to the State as guarantor. See A/33/10 (see, Annex, Report of the Working Group on international liability for injurious consequences arising out of acts not prohibited by international law, p. 151, para. 21).

[53] A/42/10. Chapter IV, International Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law, p. 47, para 180 ff. (hereinafter: A/42/10). See also A/46/10. Report of the International Law Commission on the work of its forty-third session, 29 April – 19 July 1991, Official Records of the General Assembly, Forty-sixth session, Supplement No. 10. Extract from the Yearbook of the International Law Commission 1991, Vol. II (Part Two), p. 116, para. 242.

[54] Preliminary report, p. 261, para. 48. At the end, this concept was accepted and is laid down as Principle 4(5) in the 2006 Draft Articles.

[55] A/49/10., p. 155, para. 368. Cf. also the ILC's Commentary to the Article C [9 and 10] in: A/50/10. Report of the International Law Commission on the work of its forty-seventh session, 2 May – 21 July 1995, Official Records of the General Assembly, Fiftieth session, Supplement No.10. Extract from the Yearbook of the International Law Commission 1995, Vol. II (Part 2), p. 98, para. 30 (where the Commission also stated that *the Convention is further unique in that it allows the injured party the choice as to whether to pursue a claim for compensation through domestic courts or to make a direct claim against the State through diplomatic channels*).

[56] Even though Article 3(b) pursued to materialize the "polluter pays" concept in cases of impairment inflicted to the environment it did not based its scope upon the strict liability principle. (see 2006 Draft Principles, p. 74, paras 14-16).

age caused by an object's outer space activities impacting the Earth's surface. The same is not entirely true of the 2006 Draft Principles[57] because, as the ILC noted*, before identifying the elements of damage, it is important to note that the damage, to be eligible for compensation, should reach a certain threshold*;[58] that is, it must be *significant*.[59] Moreover, compared to the Convention's provision, the 2006 Draft Principles are more environmentally–oriented.[60] It is also not less accurate that in a situation like the one described in Principle 6(1) and (2) of the 2006 Draft Principles, it is recommended that the victim seek compensation through the judiciary channels of the state of origin while under the Convention's Article XI, this is just an option. But, against this backdrop, another question arises in light of the findings above. If so, is it possible to state that the Convention's impact on the international liability principles stopped halfway through the 1990s without any traces or legacies detectable in the text of the 2006 Draft Principles? The answer to this question is simple: no, it did not.

Firstly, the drafters of the Conventions and the drafters of the 2006 Draft Principles faced the same philosophical and moral dilemma of balancing the freedom of states to act and their duty not to injure.[61] And it is enough to compare the text of the Convention and the 2006 Draft Principles to conclude that at the theoretical level, both legal acts go in the same direction as some of their preamble fragments and specific provisions are similar or even the same. Both are victim-oriented and seek to find an equilibrium between the competing interest of industry and potential victims.[62] Both are based on the premise that the precautionary principle, even if meticulously implemented, cannot guarantee that harm or injury not be inflicted by the activities falling within the respective scope of their regulation.[63] And despite visible differences in the definition of the term

[57] 2006 Draft Principles, p. 77, para. 3.

[58] *Ibid*., p. 64, para. 1.

[59] *Ibid*., p. 65, para. 2.

[60] Cf. Principle 2, paras (a)(iii) – (v)).

[61] This dilemma was also known to Robert Quentin Baxter, see his Preliminary report, para. 11

[62] Cf. Recital 5 of the Preamble to the Liability Convention and Article 3(a) of the 2006 Draft Principles. However, in the Convention text, this effort seems to be more visible. Cf. the Liability Convention's Preamble *Recognizing the need to elaborate effective international rules and procedures concerning liability for damage caused by space objects and to ensure, in particular, the prompt payment under the terms of this Convention of a full and equitable measure of compensation to victims of such damage.* Against this backdrop, see comment by Hurwitz (B.A. Hurwitz, 1992, *op. cit*., p. 10) on the 2006 Draft Principles – see Principle 4. Prompt and Adequate Compensation read together with the ILC's commentary, where the Commission noted that *as long as compensation given is not arbitrary of grossly disproportionate to the damage actually suffered, even if it is less than full, it can be regarded as adequate. In other words, the adequacy is not intended to denote "sufficiency".*

[63] Cf. B.A. Hurwitz, 1992, *op. cit*., p. 10 (underlying that the Preamble of the 1972 Convention states, i.e., *Taking into consideration that, notwithstanding the precautionary measures to be taken* (…) *damage may on occasion be caused by such objects.* Cf. in this context the 2006 Draft

"damage", some similarities do exist concerning the protection of life and property.[64] Also, the prompt and adequate compensation standard is understood along similar patterns.[65] Finally, and perhaps most importantly, commenting on Principle 6(4),[66] the ILC underlined that sometimes, given the bureaucratic obstacles, the longevity of proceedings, or their prohibitive cost, the traditional diplomatic way may, at the end of the day, appear more expeditious and efficient for potential claimants than formal judicial proceedings.[67] Thus, it does not seem to be a pure coincidence that the Commission, in its Commentaries, directly invoked the case Cosmos 954 as proof that such a method of dispute settlement is not only legitimate but, sometimes, the most satisfactory for the victims.[68]

PART III

The ILC deliberately divided its works on the liability and responsibility of states into two separate topics.[69] One could expect that in the wake of this decision, the crossovers were eventually set to the effect the ILC works on responsibility and liability could not have informed each other. This conventional wisdom

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Articles Preamble which states *that incidents involving hazardous activities may occur despite compliance by the relevant State with its obligations concerning prevention of transboundary harm from hazardous activities*).

[64] See 2006 Draft Principles. It is interesting to observe that even though the loss of income is not mentioned in either these provisions as compensable, it is nonetheless a common opinion among commentators that claimants may claim not only the direct damage but also the loss of profit. Cf. B.A. Hurwitz, 1992, *op. cit*., p. 15 and 2006 Draft Principles – Commentaries, p. 68, para. 8.

[65] Cf. Recital 5 of the Preamble to the Liability Convention and Article 3(a) of the 2006 Draft Principles. However, this effort seems to be more visible in the text of the Convention. Cf. the Preamble of the Liability Convention: *Recognizing the need to elaborate effective international rules and procedures concerning liability for damage caused by space objects and to ensure, in particular, the prompt payment under the terms of this Convention of a full and equitable measure of compensation to victims of such damage.* Against this backdrop, see Hurwitz's comment (B.A. Hurwitz, 1992, *op. cit*., p. 10). When it comes to the 2006 Draft Principles see *Principle 4 Prompt and Adequate Compensation* read together with the ILC's commentary, where the Commission noted that *as long as compensation given is not arbitrary of grossly disproportionate to the damage actually suffered, even if it is less than full, it can be regarded as adequate. In other words, the adequacy is not intended to denote "sufficiency"* (quotation after Draft principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities, with commentaries 2006. Yearbook of the International Law Commission 2006, Vol. II Part 2, Report of Commission to the General Assembly on the work of its the fifty-eighth session, United Nations, New York/Geneva 2013, A/CN.4/SER.A/2006/Add.1 (part 2), p. 78 para. 8.

[66] This paragraph states the following: *States may provide for recourse to international claims settlement procedures that are expeditious and involve minimal expenses.*

[67] 2006 Draft Principles – Commentaries, p. 87, para. 10 and p. 88, para. 12.

[68] *Ibid.* (see footnote 475).

[69] See Part I of the present article.

is, to a greater extent, true, but not entirely. Some Special Rapporteurs (notably R.Q. Quentin–Baxter) believed that some provisions of the Liability Convention became customary rules of international law over time. These were notably Article I(c), read together with Article V that introduced joint and several responsibility of states for damage caused by the space object launched by them.[70] As these rules originated from the Liability Convention, not surprisingly, they were thoroughly examined by the ILC within the framework of its proceedings on the liability of states.[71] Still, regarding the shift discussed in Part II, Articles IV and V of the Convention were not incorporated into the 2006 Draft Pronciples.

Nonetheless, even though the Commission deliberately excluded the liability of states from the scope of the work concerning the responsibility of states for wrongful acts, Special Rapporteur James Crawford included in his commentary the following general remark: *Phrases like "joint and several responsibility" or "joint and several liability" were incorporated in treaties, as in the case of the Convention on the International Liability for Damage Caused by Space Objects*.[72]

To be sure, Crawford cautioned against some interpretative problems arising from the different understanding of this mechanism (deeply rooted in the various domestic legal systems).[73] Furthermore, some ILC Members were openly opposed to the quotation of the Liability Convention in the commentary.[74] Despite these objections, "joint and several responsibility" was incorporated into Article 46 of the ARSIWA. It is also noteworthy that Article 47, concerning the plurality of responsible states, introduces the mechanism of joint and several responsibility of injuring states modelled on Article IV of the Liability Convention. Even though the differences between both provisions are apparent, it is clear that the Commission paid due attention to it when it drafted Article 47.[75]

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[70] See Baxter's Fifth Report, *op. cit*., p. 159, para. 12.

[71] A/45/10, *op. cit.,* p. 102, paras 517 and 518 (see also footnote 356 on the same page) and A/49/10, *op. cit.,* p. 158, para. 378.

[72] A/CN.4/SER.A/2000/Add.1 (Part 2)/Rev.1. Yearbook of the International Law Commission 2000. Report of the Commission to the General Assembly on the work of its fifty-second session, New York/Geneva, 2006, p. 45, para. 249.

[73] *Ibid*.

[74] *Ibid.,* p. 48 ff., paras 272-274.

[75] Article IV(2) introduces rules on apportionment of compensation between the liable states, whereas Article 47(2b) ARSIWA states simply that the right of the injured state to claim damages from any injuring state *is without prejudice to any right of recourse against the other responsible States.* Therefore the ILC in its commentary stated overtly that Article IV(2) *is clearly a lex specialis, and it concerns liability for lawful conduct rather than responsibility in the sense of the present articles. At the same time, it indicates what a regime of "joint and several" liability might amount to so far as an injured State is concerned. Ibid.,* p. 125, para. 5. See also *ibid.,* p. 125, para. 10.

Moreover, Article 39 of the same Draft Articles concerning contribution to the injury[76] was modelled on Article VI of the Liability Convention. As the ILC noted in its commentary to the ARSIWA, *not every action or omission which contributes to the damage suffered is relevant for this purpose. Rather, article 39 allows to be taken into account only those actions or omissions which can be considered as willful or negligent, i.e. which manifest a lack of due care on the Part of the victim of the breach for his or her own property or rights.* And in the footnote at the end of this fragment, the ILC added that *This terminology is drawn from article VI, paragraph 1, of the Convention on International Liability for Damage Caused by Space Objects*.[77]

The question of the extent to which the Liability Convention could have informed the rules of responsibility and liability of international organizations is the issue that begs for additional results. On the one hand, Articles XXIV to XXVII excluded the possibility of accession of international organizations to this agreement. On the other hand, as early as the 1980s, Robert Quentin Baxter suggested that Article XXII could deliver a model for future solutions concerning the liability of international organizations and their member states for damage caused by acts not prohibited by international law.[78] Thus, it does not seem to be a coincidence that the Commission invoked precisely Article XX(3) of the Liability Convention when the ILC began working on the responsibility of international organizations.[79] After all, even though the ILC Commentary failed to admit it openly, Articles 47 and 48 of the ARIO are constructed along the same (Article 47) or similar pattern (Article 48) as those of provisions of the Convention quoted above.[80]

CONCLUSIONS

So what lessons do we learn here about the relations between the Liability Convention and some other legal instruments codifying or progressively developing international rules on responsibility and liability? They are numerous.

Firstly, when it comes to the liability of states, it seems probable that if the Commission did not drop the topic from the list altogether, this resulted from

[76] Article 39 entitled *Contribution to injury* is as follows: *In the determination of reparation, account shall be taken of the contribution to the injury by wilful or negligent action or omission of the injured State or any person or entity in relation to whom reparation is sought.*

[77] See ARSIWA, *op. cit.,* p. 110, para. 5 (see footnote 626 on the same page).

[78] See Baxter's Fifth Report, *op. cit.,* p. 169, para. 36.

[79] A/CN.4/SER.A/2002/Add.1 (Part 2). Report of the Commission to the General Assembly on the work of its fifty-fourth session. Yearbook of the International Law Commission 2002 Vol II, Part. II UN, New York and Geneva 2009, p. 94, para. 468.

[80] See ARIO, *op. cit*., p. 88 ff.

the conviction that the previous works on state liability reached the "point of no return." Moreover, this point could have been probably unreachable had 1972 the Liability Convention not entered into force, as the protagonists of the state liability concept would have been deprived of a powerful argument in favor of their general claims. One can only guess the extent of the outcome of the ILC, had a more robust practice around the applicability of the Convention arisen. Undoubtedly, however, during the first phase of the preparatory work in 1978-1997, its role was considered by some authors so significant that they were ready to believe a state liability convention inspired by provisions of the Liability Convention was politically feasible.[81]

Secondly, it is not less accurate that – because of the broader shift after the end of the Cold War and the radical change it entailed in the ILC approach – the Convention could no longer influence the 2006 Draft Principles more decisively. However, the legacies of the 1980s, when the Convention played a significant role in the ongoing discussions on international liability, could not have been entirely eradicated. Thus, it should not be overlooked that both the Liability Convention and the 2006 Draft Principles are victim-oriented. Both regimes make the state responsible for the activities of individuals, although – to be sure – the tasks and duties placed upon states in the Liability Convention differ from those laid down in the 2006 Draft Principles. Some of the terminology used in the latter can be traced back to the Liability Convention,[82] even though, to some authors, its lack of clarity is deeply frustrating.[83] Therefore, it is apparent that despite the shift mentioned above, which took place from 1997 onward and dramatically influenced the final shape of the 2007 Draft Principles, at least some legacies of this first decade of the ILC work on state liability seem durable.

But perhaps the most striking and a bit ironic is this Convention's limited but multidimensional impact upon the later development of the law of responsibility. Even though the ILC purposed to draw a line between responsibility and liability, this effect was not fully achieved. Firstly, during the works of the Commission on Responsibility of States, the Liability Convention – although to a limited extent – continued to inform the drafters of the ARSIWA, as its Articles 46 and 47 were modelled on the analogous provisions of the Liability Convention. What is more, both these articles informed the drafters of the ARIO during the ILC proceedings on the rules of responsibility of international organizations.

[81] Cf. B.A. Hurwitz, who believes that it will be therefore very surprising if the Commission does not succeed in drafting a convention on international liability which will be endorsed by both developed and developing countries (B.A. Hurwitz, 1992, *op. cit*., pp. 194). In another place in the same book he also strongly advocates the Liability Convention as a top reference point in future works of the ILC on different aspects of international liability (*ibid.,* p. 207). See also his notes on p. 143.

[82] B.A. Hurwitz, 1992, *op. cit*., pp. 207.

[83] M. Forteau, 2010, *op. cit.*

Finally, on a more general plane, in the context of the general theory of international law, these conclusions seem to support two additional propositions. Firstly, even though a conventional regime is drafted as self-contained (as is the case of the Liability Convention), it does not preclude it (at least not entirely) from inspiring the ILC when drafting the provisions of a more general character. Secondly, sometimes the intellectual inspiration is not wholly prevented, even when the Commission draws a more or less strict line between the two topics to avoid confusion on the theoretical and practical levels. The history of the Convention's Articles IV and V that managed to cross these borders to get eventually incorporated into the ARSIWA illustrates this point.

REFERENCES

Burke J.A., *Convention on International Liability for Damage Caused by Space Objects: Definition and Determination of Damages After the Cosmos 954 Incident*, 'Fordham International Law Journal, 1984, No. 8(2)

Crawford J., Pellet A., Olleson S., Parlett K. (eds), *The Law of International Responsibility,* Oxford 2010

Crawford J., *State Responsibility. The General Part,* Cambridge/New York 2013

Forteau M., *Space Law,* (in:) J. Crawford, A. Pellet, S. Olleson, K. Parlett (eds), *The Law of International Responsibility,* Oxford 2010

Foster W.F., *The Convention on International Liability for Damage Caused by Space Objects,* 'Canadian Yearbook of International Law' 1972, No. 10

Hurwitz B.A., *State Liability for Outer Space Activities in Accordance with the 1972 Convention on International Liability for Damages Caused by Space Objects*, Dordrecht/Boston/London/the Netherlands 1992

Kisiel E.*, Law as an Instrument to Solve the Orbital Debris Problem,* 'Environmental Law' 2021, No. 51(1)

Laganière G., *Liability for Transboundary Pollution at the Intersection of Public and Private International Law,* London 2022

Lee R.J., *The Liability Convention and Private Space Launch Service. Domestic Regulatory Responses,* 'Annals of Air & Space Law' 2006, No. 31

Pellet A., *The ILC's Articles on State Responsibility for Internationally Wrongful Acts and Related Texts,* (in:) J. Crawford, A. Pellet, S. Olleson, K. Parlett (eds), *The Law of International Responsibility,* Oxford 2010

Schmalenbach K., *International Standards for National Environmental Liability Regimes*, (in:) P. Gailhofer, D. Krebs, A. Proelss, K. Schmalenbach, R. Verheyen (eds), *Corporate Liability for Transboundary Environmental Harm. An International and Transnational Perspective,* Springer Cham 2023

Stubbe P., *State Accountability for Space Debris A Legal Study of Responsibility for Polluting the Space Environment and Liability for Damage Caused by Space Debris*, Leiden/Boston 2018

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IMPLEMENTATION OF SOFT LAW RELATING TO OUTER SPACE INTO DOMESTIC LAW

Abstract

Space law is clearly oriented towards creation of soft law instruments and their subsequent implementation directly into national law. However, it is not an ideal method for regulating the peaceful use of outer space. At least a few problematic issues should be noted. Firstly, the lack of scrutiny by parliaments with regard to soft law standards accepted by States. Secondly, the multiplicity of soft law documents on the same subject matter – especially in the case of space debris (IADC, UN, ISO or ESA), which may not be fully identical. Thirdly, developments in space technology mean that existing soft law standards may nevertheless be outdated in practice. Fourthly, the creation of new soft law is not always a quick process.

However, implementation of international soft law relating to outer space into domestic law ensures that international norms are binding under national law. It thus strives to guarantee both the development and the effectiveness of international space law, despite the absence of new treaty regulations.

KEYWORDS

implementation, soft law, space law, domestic law

SŁOWA KLUCZOWE

implementacja, soft law, prawo kosmiczne, prawo krajowe

1. INTRODUCTION

The implementation of treaty norms into domestic law is a well-known and relatively comprehensively studied topic in legal scholarship. The issue is part of a broader subject of the effectiveness of international law in the domestic legal order. With regard to the main space treaties, implementation primarily relates to issues such as authorization and supervision over space activities carried out from the state's territory and by its citizens, the establishment of a register of objects launched into outer space and the rules on liability for damage of private operators or owners of space objects where due to their conduct liability of a State is engaged. Conversely, an issue that has not yet been comprehensively analysed is the implementation of international soft law relating to outer space into domestic law. The term implementation in this context is understood primarily as encompassing legislative action, i.e. enacting domestic legislation, which either incorporates soft law or at least refers to it.

Globalisation fosters the growing importance of soft law norms on an international plane.[1] This is due to the relative ease of creating and modifying these norms compared to multilateral treaties. States consider such flexibility, in particular in regulating areas subject to rapid changes, due to, for example, fast technological progress, an important factor when deciding to apply soft law instruments. These processes tend to involve deformalization of sources of international law.[2] Such a phenomenon can be particularly evident in international space law.

The article comprises three parts. First, the issue of importance of soft law in international space law will be addressed. Second, the problem of implementation of international soft law to domestic legal order will be briefly characterised. Finally, the implementation of outer space-related soft law to domestic law will be presented. Given the journal's limits on article size, this contribution will introduce a general perspective of the issue at hand. Thus, it will not discuss some

[1] C. Mik, *Państwo i Prawo Wobec Procesów Internacjonalizacji, Integracji i Globalizacji.* Vol. 2. *Wpływ Globalizacji na Klasyczny Paradygmat Państwa i Prawa w Cieniu Pandemii*, Warsaw 2022, p. 373.

[2] J. d'Asprement, *Epistemic Forces in International Law. Foundational Doctrines and Techniques of International Legal Argumentation,* Cheltenham-Northampton 2016, p. 61.

broader questions such as the significance of soft law in international law[3] or the need for new treaties in international space law.

2. OUTER SPACE-RELATED SOFT LAW

Despite the dynamic development of humankind's activities in space over the past 40 years which have involved states, international organisations and private actors, general international space law has developed primarily through soft law instruments.[4] Martinez identifies two equal pillars that build space law – binding norms and soft norms.[5] Soucek and Tapio label the current stage of development of this branch of law as the "era of guidelines".[6]

As a result, the direction of development of law which assumes that one should first negotiate a soft law document and then, on its basis, a treaty or other binding instrument is no longer evident. Such a sequencing presented in the early days of the creation of international space law nowadays seems to have very limited relevance.

There are several reasons that explain this situation: the slow pace in negotiating multilateral treaties and the uncertainty of how quickly they may be

[3] On this topic see seminal works: R. Baxter, *International Law in Her Infinite Variety*, 'International and Comparative Law Quarterly' 1980, Vol. 29(4), pp. 549–566; P. Weil, *Towards Relative Normativity in International Law?*, 'American Journal of International Law' 1983, Vol. 77, pp. 413–442; J. Klabbers, *The Redundancy of Soft Law*, 'Nordisk Journal of International Law' 1996, Vol. 65(2), pp. 167–182; D. Shelton (ed.), *Commitment and Compliance: The Role of Non-binding Norms in the International Legal System,* Oxford 2000; J. Pauwelyn, R.A. Wessel, J. Wouters (eds), *Informal International Lawmaking,* Oxford 2012.

[4] The term soft law is understood here as in the broad definition formulated by Shelton as 'normative provisions contained in non-binding texts', D. Shelton, 2000, *op. cit.,* p. 292 and Snyder ''Soft law is rules of conduct which, in principle, have no legally binding force but which nevertheless may have practical effects', F. Snyder, *Soft Law and Institutional Practice in the European Community*, (in:) S.M. Stephen (ed.), *The Construction of Europe – Essays in Honour of Emile Noel,* Dordrecht 1993, pp. 197–226. It is to be noted, however, that other definitions have also been proposed, in particular in the context of international space law: ''soft law describes regulations which have the purpose of steering behaviour and conduct of states by creating recommendations and guidelines, which do not have sanctions that can be implemented in case of violations', C. Brünner, G. Königsberger, *Regulatory Impact Assessment,* (in:) I. Marboe (ed.), *Soft Law in Outer Space: The Function of Non-Binding Norms in International Space Law*, Böhlau 2012.

[5] P. Martinez, *The Role of Soft Law in Promoting the Sustainability and Security of Space Activities*, 'Journal of Space Law' 2020, Vol. 44(2), p. 522; similarly, F. Tronchetti, *Soft Law in Outer Space in Society, Politics and Law*, (in:) C. Brünner, A. Soucek (eds), *Outer Space in Society, Politics and Law*, SpringerLink 2011.

[6] J. Tapio, A. Soucek, *National Implementation of Non-Legally Binding Instruments: Managing Uncertainty in Space Law?*, 'Air & Space Law' 2019, Vol. 44(6).

accepted by a sufficient number of states (the 1979 Moon Agreement ratified by only 18 States is a good example of this problem);[7] the burdensome constitutional requirements for ratifying treaties (as is the case in the United States); or greater tendency to compromise when negotiating soft law documents. These types of justifications have underpinned the relatively rapid development of soft law relative to the use of space. Unlike in other areas of international law, however, the development of soft law has not been a result of the lack of capacity of States to comply with new commitments in this area. Nevertheless, it should be borne in mind that the willingness of States to accept soft law norms is also subject to limits, as the unsuccessful draft International Code of Conduct for Outer Space Activities well demonstrates.

The focus on soft law norms in this area does not preclude the development of traditional sources of international law. Indeed, soft law can interact with hard law in various ways. It can be an element for preparation of a treaty (such as the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space was a basis for the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies).[8] Moreover, general support by states for soft law instruments can be proof of existence of an *opinio iuris*, which contributes to creation of customary norms.[9] Furthermore, soft law as a subsequent agreement or subsequent practice can influence interpretation of binding treaty norms.[10] What is relevant, as indicated by the International Law Commission in its recently concluded works, is the fact that agreements and practice of only some state parties to a multilateral treaty also can have interpretative importance.[11] Nonetheless,

[7] COPOUS, Status of International Agreements relating to activities in outer space as at 1 January 2022, 28 March 2022, A/AC.105/C.2/2022/CRP.10.

[8] The Treaty recalls the resolution in its preamble, UNTS 205.

[9] Legality of the Threat or Use of Nuclear Weapons, ICJ Rep. 1996, pp. 254–255, para. 70; S. Marchisio, *Commentary – The Evolutionary Stages of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS)*, 'Journal of Space Law' 2005, Vol. 31, p. 219.

[10] The 'current international space law, namely the Outer Space Treaty, the Registration and the Liability Conventions have in fact been reinterpreted by non-binding United Nations General Assembly Resolutions', S. Hobe, *Space Law – an Analysis of its Development and its Future,* (in) C. Brünner, A. Soucek (eds), *Outer Space in Society, Politics and Law*, SpringerLink 2011, p. 85; cf.: Draft conclusions on subsequent agreements and subsequent practice in relation to the interpretation of treaties, Report of the International Law Commission of 2018, A/73/10. Conclusion 6(2): "Subsequent agreements and subsequent practice under article 31, paragraph 3, may take a variety of forms" and Conclusion 10(1): "An agreement under article 31, paragraph 3 (a) and (b), requires a common understanding regarding the interpretation of a treaty which the parties are aware of and accept. Such an agreement may, but need not, be legally binding for it to be taken into account".

[11] *Ibid.* Conclusion 4(3). "A subsequent practice as a supplementary means of interpretation under article 32 consists of conduct by one or more parties in the application of the treaty, after its conclusion".

even if such an effect of soft law on international law cannot be found, it can still autonomously influence the behaviour of states, in particular through its implementation into national law.

Soucek and Tapio[12] classify UN soft law relating to outer space as Principle resolutions,[13] Practice resolutions[14] and Guidelines resolutions.[15] From the perspective of implementation into domestic law the most pertinent instruments are[16]:

- The Principles Relevant to the Use of Nuclear Power Sources in Outer Space;
- The Safety Framework for Nuclear Power Source Applications in Outer Space;[17]
- The Space Debris Mitigation Guidelines;[18]
- The Recommendations on Enhancing the Practice of States and International Intergovernmental Organizations in Registering Space Objects;
- Guidelines for the Long-Term Sustainability of Outer Space Activities;
- ISO standard 24113 – Space Debris Mitigation Requirement.[19]

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[12] J. Tapio, A. Soucek, 2019, *op. cit.,* pp. 567–568.

[13] Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, UNGA Res A/RES/18/1962 (13 December 1963); Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, UNGA Res A/RES/37/92 (10 December 1982); Principles Relating to Remote Sensing of the Earth from Outer Space, UNGA Res A/RES/41/65 (3 December 1986); Principles Relevant to the Use of Nuclear Power Sources in Outer Space, UNGA Res A/RES/47/68 (14 December 1992); Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries, UNGA Res A/RES/51/122 (13 December 1996).

[14] Recommendations on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space, UNGA Res A/RES/68/74 (11 December 2013); Application of the Concept of the 'Launching State', UNGA Res A/RES/59/115 (25 January 2005); Recommendations on Enhancing the Practice of States and International Intergovernmental Organizations in Registering Space Objects, UNGA Res A/RES/62/101 (10 January 2008).

[15] Guidelines for the Long-Term Sustainability of Outer Space Activities adopted by COPUOS in 2019, A/74/20, Annex II; Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space, endorsed by the UNGA in 2007 as an annex to the International Cooperation in the Peaceful Uses of Outer Space, UNGA Res A/RES/62/217 (22 December 2007).

[16] The author also notices the significance of the Charter On Cooperation To Achieve The Coordinated Use Of Space Facilities In The Event Of Natural Or Technological Disasters (UNHCR, 25 April 2000, Rev.3 (25/4/2000)). Although this document is not a treaty, the author does not agree with its qualification as a soft law document. The analysis of the Charter inspires a conclusion that it is a document binding between its parties. See, however, a different approach in N. Clark, *Gauging the Effectiveness of Soft Law in Theory and Practice: A Case Study of the International Charter on Space and Major Disasters*, 'Air & Space Law' 2018, Vol. 43(1), pp. 77–112.

[17] Published by COPUOS, Scientific and Technical Subcommittee, and the International Atomic Energy Agency, A/AC.105/934, 2009.

[18] Inter-Agency Space Debris Coordination Committee, IADC Space Debris Mitigation Guidelines, IADC-02-01, Revision 1, Sept. 2007.

[19] ISO 24113:2019, Space Systems – Space Debris Mitigation Requirements, www.iso.org.

3. IMPLEMENTATION OF INTERNATIONAL SOFT LAW INTO DOMESTIC LAW

As a general rule, the concept of implementation of international law into national law is applied to binding norms, particularly those of a treaty nature, and is the result of the principle of *pacta sunt servanda* and the principle of not invoking provisions of domestic law as justification for the failure to respect a treaty rule (Articles 26 and 27 of the Vienna Convention on the Law of Treaties).[20] The obligation to bring domestic law into line with international obligations has also been emphasised in the decisions of international courts as deriving from customary law.[21]

Thürer notes that soft law standards stemming from recommendations of the International Labour Organisation or the Committee of Ministers of the Council of Europe can influence interpretation of domestic law by national courts.[22] At the same time, the uniqueness of certain regimes of international soft law, which, due to their importance, are implemented in full or to a large extent into national law, is recognised. This applies in particular to standards of the Basel Committee on Banking Supervision, recommendations of the Financial Action Task Force, G-20 recommendations, standards prepared by FAO together with UNEP and OECD guidelines and principles.[23]

This phenomenon is linked to the increasingly emerging mechanisms for verifying states' compliance with soft law.[24] An example of the reinforcement of the legal weight of soft law through national law is the US 1992 High Seas Driftnet Fisheries Enforcement Act, which required the Secretary of Commerce to impose

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[20] K. Schmalenbach, *Article 27 Internal Law and Observance of Treaties*, (in:) O. Dorr, K. Schmalenbach (eds), *The Vienna Convention on the Law of Treaties,* Berlin/Heidelberg 2012 p. 462; S.E. Nahlik, *Kodeks prawa traktatów*, Warsaw 1976, pp. 185-186.

[21] The 21 February 1925 Permanent Court of International Justice advisory opinion on the exchange of Greek and Turkish Populations, PCIJ, series B10, p. 20, states that '(..) a State which has contracted valid international obligations is bound to make in its legislation such modifications as may be necessary to ensure the fulfilment of the obligations undertaken.'; Judgment of 25 May 1926, Case Concerning Certain German interests in Polish Upper Silesia, PCJIL, Series A7, 1926, p. 17, 22 and 42, as well as Judgment of 27 August 1952, Case Concerning Rights of Nationals of the United States in Morocco, ICJ Rep. 1952, p. 176.

[22] D. Thürer, *Soft Law*, Max Planck Encyclopaedia of Public International Law online, § 30.

[23] OECD, *Soft Law*, https://www.oecd.org/gov/regulatory-policy/irc10.htm (accessed 12.07.2023).

[24] UNGA resolution called upon states to implement fully a global moratorium on all large-scale pelagic driftnet fishing by the end of 1992. To ensure that this happened, the United Nations set up a supervisory mechanism in which the United Nations Secretary General reported to the UNGA on the resolution's implementation. The UN Food and Agricultural Organization (FAO) and the United Nations Environment Programme (UNEP) monitored the status of high seas driftnet fishing, D. Shelton, 2000, *op. cit.*, p. 538.

sanctions on a State that allows fishing with driftnets, despite the fact that the prohibition of this type of fishing only stemmed from a General Assembly resolution (46/215). In an NGO-initiated case, Humane Society v. Brown, the US Court of International Trade confirmed in 1996 that Italy violated US law by not respecting the General Assembly resolution in question. As a result, the Secretary of Commerce informed Italy that if it fails to prohibit such practices within 90 days, sanctions will be imposed.[25] Another type of such a mechanism is the US Justice for Uncompensated Survivors Today Act which requires that "the Secretary of State shall submit a report (…) that assesses and describes the nature and extent of national laws and enforceable policies (…) consistent with, and evaluated with respect to, the goals and objectives of the 2009 Holocaust Era Assets Conference".[26] There is also a well-established practice of states requiring through their national legislation that companies comply with the UN Guiding Principles on Business and Human Rights.[27]

This relatively brief evaluation of practice clearly illustrates that the implementation of soft law into national law is already an established phenomenon in international practice – albeit affecting different branches of international law to varying degrees.

4. IMPLEMENTATION OF SOFT LAW RELATING TO OUTER SPACE INTO DOMESTIC LAW

The development of international space law in the last 50 years, primarily through soft law norms, provides a typical approach for states when developing their own national regulations to also take these norms into account.[28] Undoubtedly, the major practice in this respect concerns mitigation of space debris.[29] A number of states indicate that international guidelines in this area have been

[25] A. Blackwell, *The Humane Society and Italian Driftnetters: Environmental Activists and Unilateral Action in International Environmental Law*, 'North Carolina Journal of International Law' 1997, Vol. 23, p. 313.

[26] S.447 – Justice for Uncompensated Survivors Today (JUST) Act of 2017, Section 2, letter b (USA).

[27] Modern Slavery Act 2015, 2015 c.30 (UK); Regulation (EU) 2017/821 of the European Parliament and of the Council of 17 May 2017 laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas, OJ L 130, 19.5.2017, p. 1–20.

[28] I. Supancana, *How the Progressive Development of Outer Space Law Affects the Formulation of National Space Legislation: The Experience of Indonesia*, 'Air & Space Law' 2015, Vol. 40(1), pp. 93–106.

[29] I. Marboe, G. Hafner, *Brief Overview over National Authorization Mechanisms,* (in:) F.G. von der Dunk (ed.), *Implementation of the International Space Treaties*, Nijhoff 2011, p. 70;

implemented into their national law or are being followed by their national agencies and other actors. In Australia, internationally recognised guidelines or standards for debris mitigation are outlined in the Space Act 2018 and the Space Rules 2019.[30] The Austrian Outer Space Act provides that "the operator has to make provision for the mitigation of space debris in accordance with the state of the art and in due consideration of the internationally recognised guidelines for the mitigation of space debris. Especially measures limiting debris released during normal operations have to be taken".[31] The Danish Executive Order on requirements in connection with approval of activities in outer space explicitly refers to ISO standards.[32] The Finnish Act on Space Activities provides that an operator shall seek to ensure that the space activities do not generate space debris in accordance with generally accepted international guidelines.[33] Similar regulations can be found, for example, in Greece.[34] In assessing a mission proposed by a licence applicant, the UK Space Agency requires that applicants demonstrate compliance/conformance with existing norms/best practices such as the IADC Space Debris Mitigation Guidelines, Space Debris Mitigation Guidelines of the COPUOS, and other international standards relating to debris.[35] The Indian Space Research Organisation (ISRO) follows internationally accepted Space Debris Mitigation Guidelines and best practices while conducting space operations.[36] Mexico has emphasized that the compliance rate of space debris mitigation guidelines (estimated to be between 40 and 60 per cent) is far from optimal.[37] Myanmar has expressed plans for implementing space debris mitigation "as it is important to ensure a secure and peaceful space environment while its own satellite system is in progress".[38] States that do not explicitly refer to international standards in their national law and regulate the issue autonomously – such as France and Germany – indicate at the same time that their regulation is in line with international standards.[39]

Similar to the space debris mitigation guidelines, the norms concerning Nuclear Power Source Applications in Outer Space are also not subject to treaty

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cf. Sofia Guidelines for a Model Law on National Space Legislation, annex to ILA Resolution No. 6/2012 Space Law.

[30] UNOOSA, Compendium Space Debris Mitigation Standards Adopted by States and International Organizations, 28 March 2021, p. 9.

[31] *Ibid.*, p. 11.

[32] *Ibid.*, p. 27.

[33] *Ibid.*, pp. 29.

[34] *Ibid.*, pp. 39-40.

[35] *Ibid.*, pp. 79-80.

[36] *Ibid.*, pp. 41-42.

[37] UNOOSA, Research on space debris, the safety of space objects with nuclear power sources on board and problems relating to their collision with space debris, 17 November 2022, A/AC.105/C.1/123, p. 11.

[38] *Ibid.*, p. 12.

[39] UNOOSA, 2021, *op. cit.*, pp. 32-37.

regulations. Still, India has demonstrated its readiness to apply them in case Indian space facilities use such a power source.[40]

The need for such implementation into national law is particularly highlighted in the guidelines on the long-term use of space. It is worth noting that when accepting these guidelines "The Committee encouraged States and international intergovernmental organizations to voluntarily take measures to ensure that the guidelines were implemented to the greatest extent feasible and practicable".[41] The Explanatory Memorandum accompanying this document specifies that states and intergovernmental organisations should, on a voluntary basis through national mechanisms, ensure the implementation of these guidelines to the greatest extent possible (§ 16). In addition, it is envisaged that COPUOS will provide a forum to discuss practical issues concerning the implementation of these guidelines.

The guidelines themselves point to the need to implement generally accepted international norms, standards and practices into the national regulatory framework (§ A.1.2), in particular the requirement to implement a number of already mentioned General Assembly resolutions (e.g. A.2.2).

A number of countries report on the implementation of the guidelines at national level. In 2023, these were Japan, Austria, the United States, Norway, Italy, Germany, and Brazil and in 2022 it was the United Kingdom.[42] Japan, for example, informs in its report that when adopting or amending guidelines for domestic regulations it requires them to be equivalent to generally accepted international standards.[43]

Implementation of the guidelines was considered such an important issue that a working group was setup within the COPUOS to monitor this process.[44] Still, it needs to be noted, as Tapio and Soucek rightly point out, that implementation of several guidelines will not be possible through sole reference in national legislation due to the lack of sufficient specificity of the guidelines in question.[45]

[40] UNOOSA, 2022, *op. cit*., pp. 6-7.

[41] UNGA, Report of the Committee on the Peaceful Uses of Outer Space, Sixty-second session, (12–21 June 2019), A/74/20, para. 163.

[42] UNOOSA, Long-term Sustainability of Outer Space Activities, https://www.unoosa.org/oosa/en/ourwork/topics/long-term-sustainability-of-outer-space-activities.html (accessed 14.07.2023).

[43] UNGA, Report on the implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities in Japan, 8 February 2023, A/AC.105/C.1/2023/CRP.28.

[44] UNGA, 2019, *op. cit*., paras 165-167.

[45] J. Tapio, A. Soucek, 2019*, op. cit.,* p. 581.

5. CONCLUSION

The development of new soft law standards is regarded by many states as still the most reliable method for the development of international space law.[46]

The relative success of soft law regulations in international space law does not mean that this development path remains without controversy. Undoubtedly, it is not an ideal method for regulating the peaceful use of outer space and subsequently implementation into national law. At least a few problematic issues should be noted. Firstly, the lack of scrutiny by parliaments with regard to soft law standards accepted by states. This is a consequence of the legislative technique of placing only a general reference to these standards in legislative or executive acts. As a result, parliaments may not be able to control the content of the obligations required of national actors. Secondly, the multiplicity of soft law documents on the same subject matter – especially in the case of space debris (IADC, UN, ISO, or ESA), which may not be fully identical.[47] This raises the question as to which standards should be applied under national law. Thirdly, developments in space technology mean that existing soft law solutions may nevertheless be outdated in practice – this is, for example, pointed out in relation to the space debris mitigation guidelines, which do not take into account the phenomenon of megaconstellations. Fourthly, the creation of new soft law is not always a quick process. It took eight years to adopt guidelines for the long-term use of space. This weakens to some extent the argument regarding the speed with which soft law standards are created compared to treaties. However, negotiating multilateral agreements and, in addition, waiting for their entry into force is still usually a longer process (unless they are applied provisionally).

In conclusion, space law is clearly oriented towards a creation of soft law instruments and their subsequent implementation directly into national law. To what extent such a legislative technique, which works for example in international financial law, will prove effective and guarantee legal certainty in the long term

[46] Cf. A practical and inclusive approach to identifying and studying challenges and considering possible new guidelines. Conference room paper submitted by Canada, Italy, Japan, Luxembourg, New Zealand, the United Kingdom of Great Britain and Northern Ireland and the United States of America, 16 February 2023, A/AC.105/C.1/2023/CRP.31/Rev.2, para. 3: "To progress and complement the work of 'LTS 1.0', the Working Group should focus on next steps rather than amending or revising previously adopted Guidelines. The identification of possible new guidelines should instead be informed by the identification and study of new and existing challenges."

[47] When it comes to end-of-life disposal, there is a significant difference between the COPUOS debris mitigation guidelines and the IADC guidelines. The former does not incorporate the so-called '25- year rule' for removing spacecraft from protected orbital regions within 25 years after the end of nominal mission operations – S. Freeland, Y. Zhao, *Rules of the Space Road: How Soft Law Principles Interact with Customary International Law for the Regulation of Space Activities*, 'Journal of Space Law' 2020, Vol. 44(2), p. 432.

is an open question. Nevertheless, to a certain extent it ensures that international norms are binding under national law. It thus strives to guarantee both the development and the effectiveness of international space law, despite the absence of new treaty regulations.

REFERENCES

d'Asprement J., *Epistemic Forces in International Law. Foundational Doctrines and Techniques of International Legal Argumentation,* Cheltenham-Northampton 2016

Baxter R., *International Law in Her Infinite Variety*, 'International and Comparative Law Quarterly' 1980, Vol. 29(4)

Blackwell A., *The Humane Society and Italian Driftnetters: Environmental Activists and Unilateral Action in International Environmental Law*, 'North Carolina Journal of International Law' 1997, Vol. 23

Brünner C., Königsberger G., *Regulatory Impact Assessment* (in:) I. Marboe (ed.), *Soft Law in Outer Space: The Function of Non-Binding Norms in International Space Law*, Böhlau 2012

Clark N., *Gauging the Effectiveness of Soft Law in Theory and Practice: A Case Study of the International Charter on Space and Major Disasters*, 'Air & Space Law' 2018, Vol. 43

Freeland S., Zhao Y., *Rules of the Space Road: How Soft Law Principles Interact with Customary International Law for the Regulation of Space Activities*, 'Journal of Space Law' 2020, Vol. 44(2)

Klabbers J., *The Redundancy of Soft Law*, 'Nordisk Journal of International Law' 1996, Vol. 65(2)

Marchisio S., *Commentary – The Evolutionary Stages of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS)*, 'Journal of Space Law' 2005, Vol. 31

Marboe I., Hafner G., *Brief Overview over National Authorization Mechanisms,* (in:) F.G. von der Dunk (ed.), *Implementation of the International Space* Treaties, Nijhoff 2011

Martinez P., *The Role of Soft Law in Promoting the Sustainability and Security of Space Activities*, 'Journal of Space Law' 2020, Vol. 44(2)

Mik C., *Państwo i Prawo Wobec Procesów Internacjonalizacji, Integracji i Globalizacji.* Vol. 2. *Wpływ Globalizacji na Klasyczny Paradygmat Państwa i Prawa w Cieniu Pandemii*, Warsaw 2022

Nahlik S.E., *Kodeks prawa traktatów*, Warsaw 1976

Pauwelyn J., Wessel R. A., Wouters J. (eds), *Informal International Lawmaking,* Oxford 2012

Shelton D. (ed.), *Commitment and Compliance: The Role of Non-Binding Norms in the International Legal System,* Oxford 2000

Schmalenbach K., *Article 27 Internal Law and Observance of Treaties*, (in:) O. Dorr, K. Schmalenbach (eds), *The Vienna Convention on the Law of Treaties,* Berlin Heidelberg 2012

Snyder F., *Soft Law and Institutional Practice in the European Community*, (in:) S.M. Stephen (ed.), *The Construction of Europe – Essays in Honour of Emile Noel,* Dordrecht 1993

Supancana I., *How the Progressive Development of Outer Space Law Affects the Formulation of National Space Legislation: The Experience of Indonesia*, 'Air & Space Law' 2015, Vol. 40(1)

Tapio J., Soucek A., *National Implementation of Non-Legally Binding Instruments: Managing Uncertainty in Space Law?* 'Air & Space Law' 2019, Vol. 44(6)

Tronchetti F., *Soft Law in Outer Space in Society, Politics and Law*, (in:) C. Brünner, A. Soucek (eds), *Outer Space in Society, Politics and Law*, SpringerLink 2011

Weil P., *Towards Relative Normativity in International Law?*, 'American Journal of International Law' 1983, Vol. 77

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SOME LEGAL ASPECTS OF INTERNATIONAL LIABILITY FOR DAMAGE CAUSED BY MALFUNCTIONING OF SATELLITE NAVIGATION SYSTEMS

Abstract

International liability is one of the most difficult legal issues related to satellite navigation applications. The 1972 Liability Convention provides that a launching State shall be absolutely liable to pay compensation for damage caused by its space objects on the surface of the Earth or to aircraft flight, and liable for damage due to its fault in space. The legal situation of artificial satellites, including navigation satellites, is determined by their assignment to space objects. Unfortunately, the term "space object" is also not specifically defined in international space law. The main purpose of this article is to determine whether damage caused by satellite navigation systems can be covered by the Liability Convention, whether the Convention refers only to direct physical damage resulting from the fall or collision of space objects or whether it also encompasses damage resulting from the malfunctioning of a navigation space object and intangible electromagnetic waves. It seems that the present regulations of the Outer Space Treaty and the Liability Convention do not apply to satellite navigation and do not cover the damage caused by navigation's intangible signals. Unfortunately, it is rather clear that the international community is unlikely to adopt uniform rules on liability for satellite navigation signals in the near future. However, the United Nations and its Committee on the Peaceful Uses of Outer Space remain to be the best platform to work on establishing

the principles governing the issue of liability for damage caused by malfunctioning of satellite navigation systems and their signals.

KEY WORDS

satellite technologies, satellite navigation applications, international space law, international liability, space objects

SŁOWA KLUCZOWE

techniki satelitarne, zastosowania nawigacji satelitarnej, międzynarodowe prawo kosmiczne, odpowiedzialność międzynarodowa, obiekty kosmiczne

1. INTRODUCTION

International liability is one of the most difficult legal issues related to satellite navigation applications. The United Nations (UN), since the beginning of the Space Age, has been involved in work on establishing not only the legal status of outer space and celestial bodies but also the principles governing states' activities in space. One of these principles concerns the issue of international liability for the damage caused by space objects. International lawyers emphasize that "unlike responsibility for breach of law, which results from generally applicable rules of international law, liability does not have such a nature and as it relates to actions permitted by international law; it may only result from express treaty obligations between States, and apply only to those States which are parties to such international agreements".[1]

The first important document, although non-binding, which makes a reference to international liability for damage caused by space objects is the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space.[2] It was adopted by the Legal Subcommittee (LS) of the UN Committee on the Peaceful Uses of Outer Space (COPUOS) in 1963. According to Point 8 of the Declaration "Each State that launches or procures the launching

[1] Z. Galicki, *Rozwój zasad odpowiedzialności międzynarodowej za działania kosmiczne,* (in:) A. Wasilkowski (ed.), *Działalność kosmiczna w świetle prawa międzynarodowego,* Warsaw 1991, p. 56.

[2] 13 December 1963, RES 1962(XVIII). The UN COPUOS was established on a permanent basis in 1959 and at the same time two main legal issues appeared – the matter of the return of astronauts and the issue of responsibility and liability.

of the object into outer space, and each State from whose territory or facility an object is launched, is internationally liable for damage to a foreign State or to its natural or juridical persons by such objects or its component parts on the earth, in air space, or in outer space". The first binding document regulating this issue is the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of 1967 (the Outer Space Treaty).[3] Point 8 of the 1963 Declaration is reflected in its Article VII, which also imposes international liability on launching States and international organizations for damage caused by space objects and their component parts, and thus for the negative consequences of their activities in space.[4] Article VII did not modify the provisions of the Declaration. However, the concept of "a space object" followed by the term "component parts" contained both in Point 8 of the Declaration and in Article VII of Outer Space Treaty has its consequences. According to Kerrest and Smith "…this cannot be seen as substantial improvement. If it achieved anything, it complicated rather than clarified the definition".[5] Unfortunately, Article VII of the Outer Space Treaty of 1967 (unlike Article VI which establishes the principle of responsibility for national activities in outer space and requires space activities by non-governmental entities to have state authorization and continuing supervision) was silent on the principles governing liability, so there was a need for supplementary rules. They were elaborated and introduced into the Convention on International Liability for Damage Caused by Space Objects of 1972 (the Liability Convention).[6] The drafting of its text was difficult, controversial and took the LS of the COPUOS nine years to complete. The Liability Convention constitutes *lex specialis* in relation to Article VII of the Outer Space Treaty.

The Liability Convention provides that a launching State shall be absolutely liable (except where the damage results from gross negligence or from an act or omission done with intent to cause damage on the part of a claimant state or of

[3] The Outer Space Treaty was considered by the Legal Subcommittee in 1966 and agreement was reached in the General Assembly in the same year (Resolution 2222 (XXI)). The Treaty was opened for signature by the three depository Governments (the Russian Federation, the United Kingdom and the United States of America) in January 1967, and it entered into force in October 1967; At present 112 States are parties of the Treaty.

[4] Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air or in outer space, including the moon and other celestial bodies.

[5] A. Kerrest, L.J Smith, *Article VII,* (in:) S. Hobe, B. Schmidt-Tedd, K.-U. Schrogl (eds), *Cologne Commentary on Space Law,* Cologne 2009, p. 134.

[6] The Liability Convention was considered and negotiated by the Legal Subcommittee from 1963 to 1972. Agreement was reached in the General Assembly in 1971 (Resolution 2777 (XXVI)), and the Convention entered into force in September 1972. At present 98 States are parties of the Treaty.

natural or juridical persons it represents) to pay compensation for damage caused by its space objects on the surface of the earth or to aircraft flight (Article II and VI), and liable for damage due to its fault or the fault of persons for whom it is responsible in outer space (Article III). The Convention also provides for procedures for the settlement of claims for damages. As Rajski rightly notes, "[t]he subject of the legal regulation contained in the provisions of the said convention are specific types of property relations (compensatory type) of an international nature. These are relations between states, between states and international organizations and between such organizations. Therefore, the regime of liability for damage set out in the Convention has the nature of international liability, not civil law liability."[7] The same author also emphasizes that "[t]he international legal nature of the liability for damage regulated in the said convention results in certain consequences, which, among others, lead to the need to assess and interpret it in the light of international law, disregarding the rules and methods applicable in this respect in individual national civil law (or equivalent) systems, despite the ascertainable impact of certain civil constructions on a number of provisions of the Convention."[8] Czapliński and Wyrozumska even more strongly emphasize that "(...) liability for activities undertaken in outer space is the only undisputed case of introducing the construction of absolute liability, also known as risk-based liability, into international law".[9] Kerrest and Smith also add that "…Article VII contains the general liability provision on which the Liability Convention is based, acceptance of liability under one, or indeed, both treaties may be read as recognition of the binding force of the State liability rule as a customary rule of international law derived from a treaty obligation".[10]

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[7] J. Rajski, *Odpowiedzialność międzynarodowa za szkody wyrządzone przez obiekty kosmiczne*, Warsaw 1974, p. 33.

[8] *Ibidem,* pp. 33 – 34.

[9] W. Czapliński, A. Wyrozumska, *Prawo międzynarodowe publiczne,* Warsaw 2014, p. 617.

[10] A. Kerrest, L.J Smith, 2009, *op. cit.,* p. 136. During the session of the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space in 2014, the catalogue of questions was amended by a fourth question relating to international customary law ("Are there any provisions of the five United Nations treaties on outer space that could be considered as forming part of international customary law and, if yes, which ones? Could you explain on which legal and/or factual elements your answer is based?"). The German delegation is of the opinion that the general principles of the Outer Space Treaty (OST) have become international customary law since almost all States conducting activities in outer space have ratified the OST and act according to its provisions. Furthermore, a dissenting practice of the States not having signed the OST is not identifiable. Germany is of the opinion that the general principles of the OST accepted as customary law are the following: the space freedoms (Art. I OST), the non-appropriation principle (Art. II OST), the applicability of public international law to space activities (Art. III OST), the responsibility and liability of States for national activities in outer space (Art. VI and VII OST) and the duty to authorize and supervise non-governmental activities in outer space (Art. VI OST) as well as the duty to register space objects (Art. VIII OST). The universal validity of these rules is of utmost importance for the peaceful use of outer space. COPUOS, Responses to the set of

Without any doubt – navigation satellites launched in outer space are under the rule of international space law, too. Such satellites are a part of satellite navigation systems which, apart from the space segment, also include ground and user segments.[11] The effectiveness of satellite navigation depends on an adequate number of satellites – constellations of 24 to 30 or more satellites – deployed on circular orbits at an altitude of about 20,000 kilometres. Nowadays satellite navigation systems can be divided into two groups: global (core-constellation) and regional (augmentation) systems. Global Navigation Satellite Systems (GNSS) provide three main services: Positioning, full global Navigation coverage, and precise Timing signals (PNT).[12] Regional (augmentation) systems are support systems that aim to provide greater precision and availability to existing GNSS.[13] The signals emitted by the systems can be used to provide different services, e.g. to determine the position of points and moving objects, along with the parameters of their movement, regardless of the environment in which they are (outer space, air space or the surface of the Earth: both territory under sovereign authority and outside it, such as on the high seas) and regardless of the weather and time of day.[14] The damage which may occur from the provision of such services is related to vulnerabilities of satellite signals to disruption and loss of signals.[15] The major

Questions provided by the Chair of the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space, 10 April, A /AC.105/C.2/2015/CRP.11.

[11] The ground segment consists of surveillance stations that monitor each satellite continuously (they may be located in different countries). The user segment includes receivers which are placed in aircraft and marine vehicles, cars, and cell phones. The navigation receiver obtains signals from many satellites whose position is well known, compares those signals and calculates its own geographic location.

[12] At present there are the following functioning GNSS: US Global Positioning System (GPS); Russian Federation's GLONASS; European Union's 'Galileo'; and China's 'Compass' system. The concept of the GNSS was presented in K. Myszona-Kostrzewa, *Nawigacja satelitarna w świetle prawa międzynarodowego*, Warsaw 2011, p. 20 ff. and in K. Myszona-Kostrzewa (ed.), *Legal and Political Aspects of the Use of European Satellite Navigation Systems Galileo and Egnos*, Warsaw 2018, pp. 15 ff.

[13] Existing regional support systems include: WAAS (Wide Area Augmentation System), a US-based GPS support system in North America, providing greater accuracy, reliability and availability of GPS, especially in air transport; SDCM (System of Differential Correction and Monitoring), a Russian support system aiming to ensure greater accuracy and availability of GLONASS and GPS in Russia; IRNSS (Indian Regional Navigational Satellite System) is an Indian project intended to remain under civilian control, which covers India and an area of 1,000–2,000 km around it; MTSAT (Multi-functional Transport Satellite) and MSAS (Satellite-based Augmentation System) provide navigation services for all aircraft flying over Japan. QZSS (Quasi-Zenith Satellite System) is a Japanese regional GPS support system in Asia and Oceania; EGNOS is a joint project of the European Space Agency, the European Commission and the European Organisation for the Safety of Air Navigation (Eurocontrol). It was the European Union's first activity in the field of GNSS and a precursor to Galileo.

[14] More: K. Myszona-Kostrzewa, *Nawigacja satelitarna w świetle prawa międzynarodowego*, Warsaw 2011; K. Myszona-Kostrzewa (ed.), 2018, *op. cit*.

[15] K. Myszona-Kostrzewa, 2011, *op. cit*., pp. 234-235.

threats to proper signal functioning may be due to force majeure: increased solar activity, ionospheric effects (which affect propagation of the signal), but also due to interference from other electromagnetic waves (e.g. TV signals). Satellite navigation signals can be also spoofed – "captured", and retransmitted on the same frequency with much greater power, too (recipients will be provided with legitimate-looking false signals instead of the original ones – both GPS and other satellite navigation systems are vulnerable to misuse by hostile groups). It should also be stressed that the basic principle of the United States' policy is its ability to block the use of GPS in any area (by intensive jamming of the relevant frequencies). This means that provision of the navigation signal may be interrupted for reasons which are independent of the technical aspects of the GNSS operation – it may be a deliberate action dictated by a change in the political situation or conditions in international relations.

Clarifying the meaning of the terms: 'navigation satellite' and 'space object' and their 'component parts' and answering the question if intangible signals are covered by them seem to be crucial in this context. However, the main purpose of this article is to determine if the damage caused by such signals (their lack or malfunctioning) can be covered by two of the five UN treaties on outer space[16] – Article VII of the Outer Space Treaty and the Liability Convention. This paper also intends to investigate whether the Liability Convention refers only to direct physical damage resulting from the fall or collision of space objects or whether it also encompasses damage resulting from the malfunctioning of a navigation space object and intangible electromagnetic waves.

II. THE TERM 'SPACE OBJECT' – DEFINITION AND SCOPE

The space segment is the core segment of satellite navigation systems. It consists of artificial satellites launched into space (also known as navigation satellites). The concept of "artificial satellite" is not used in any of the five UN treaties on outer space. The definition of this term first of all can be found in dictionaries or encyclopaedias[17] but also in publications of international lawyers or national

[16] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of 1967; Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of 1968; Convention on International Liability for Damage Caused by Space Objects of 1972; Convention on Registration of Objects Launched into Outer Space of 1975; Agreement Governing the Activities of States on the Moon and Other Celestial Bodies of 1979.

[17] According to Encyclopaedia Britannica "an artificial satellite" is "artificial object launched into a temporary or permanent orbit around Earth. Spacecraft of this type may be either crewed or uncrewed", https://www.britannica.com/technology/Earth-satellite (accessed 8.02.2023).

space agencies. According to the United States' National Aeronautics and Space Administration (NASA) – a satellite (as defined on its website) is "…a body that orbits around another body in space. There are two different types of satellites – *natural and man-made.* A man-made satellite is a machine that is launched into space and orbits around a body in space".[18]

The legal situation of artificial satellites, including navigation satellites, is determined by their assignment to space objects. Unfortunately, the term "space object" is also not specifically defined in international space law. According Lachs, "the lack of definition of the term "space object" justifies the necessity for the law to follow the development of technology and its achievements".[19] However, as Schmidt-Tedd and Mick rightly point out, "in practice, a common understanding of the term 'space object' exists. Accordingly, a space object is every object that was launched into space in order to explore or use outer space as well as every object that is intended to be launched".[20] Also, Hobe marks that "Space objects may be defined as artificial manmade objects that are brought into space and are designed for use in outer space".[21]

Further clarification of this term is given in Article I(d) of the Liability Convention. It reads that the term "space object" includes its component parts as well as its launch vehicle and parts thereof. It can be assumed that the provision of Article 1(d) constitutes an important interpretative guidance for this term. However, as Chatzipanagiotis and Liperi rightly point out, "[i]t is unclear whether intangible parts of a space object, such as signals, are included".[22]

The general rule of interpretation laid down in Article 31(1) of the Vienna Convention on the Law of Treaties of 1969[23] adopts a textual approach – "a treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose" – on which the UN International Law Commission was unanimous. The International Court of Justice has also emphasised that interpretation is not a matter of revising treaties or of reading into them what they do not expressly or

[18] *What it a satellite?,* NASA, 5.09.2018, https://www.nasa.gov/directorates/heo/scan/communications/outreach/funfacts/txt_satellite.html (accessed 07.02.2023).

[19] M. Lachs, *Tendencje rozwojowe prawa kosmicznego,* 'Postępy Astronautyki' 1978, No. 3, p. 48.

[20] B. Schmidt-Tedd, S. Mick, *Article VIII*, (in:) S. Hobe, B. Schmidt-Tedd, K.-U. Schrogl (eds), *Cologne Commentary on Space Law,* Cologne 2009, p. 150.

[21] S. Hobe, *Article I*, (in:) S. Hobe, B. Schmidt-Tedd, K.-U. Schrogl (eds), *Cologne Commentary on Space Law,* Cologne 2009, p. 32.

[22] M. Chatzipanagiotis, K. Liperi, *Regulation of Global Navigation Satellite Systems*, (in:), R.S. Jakhu, P.S. Dempsey (eds), *Routledge Handbook of Space Law*, New York 2017, p. 165.

[23] Adopted on 23 May 1969, entered into force on 27 January 1980.

by necessary implication contain,[24] or of applying a rule of interpretation so as to produce a result contrary to the letter or spirit of the treaty's text.[25] According to Oppenhaim's International Law, "[t]he application of the basic rule of interpretation laid down in Article 31 of the Vienna Convention will usually establish a clear and reasonable meaning: if such is the case, there is no occasion to have recourse to other means of interpretation".[26] It should be stressed that terms and regulations contained in the Liability Convention are consistent with and reflect the world practice and technical knowledge of the times in which the Convention was concluded. In fact, only two states (the former Soviet Union and the United States) launched space objects at that time and scientists have only recently started to work on satellite navigation signals,[27] e.g. the American Global Positioning System – the world's most utilized satellite navigation system – became operational only in 1978 and globally available in 1994 (that is after the adoption of the Liability Convention). It would be rather difficult to prove that the member states of the COPUOS Legal Subcommittee and their representatives who were working on the draft of the Liability Convention were going to use the term "component parts as well as its launch vehicle and parts" of a space object in a sense other than the material parts of the object. Furthermore, according to Article 31(3)(b) of the Vienna Convention, "any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation" should be taken under consideration. Meanwhile, consistently with its stance, the US government (as the owner of one of the few fully functioning systems, i.e. GPS) disclaims liability for any damage caused as a consequence of its operation. The US authorities have repeatedly emphasized that civilian users of GPS signals use them voluntarily and free of charge, do not need any permits, and are not dependent on the intermediation of service providers. The open signal means that the providers do not accept any liability for its quality and worn users that they use it at their own risk.

The Cosmos 954 incident[28] (the first instance in the history of space exploration where a claim was made by one sovereign state against another on account of damage caused by a falling space object) has also proved that states engaged

[24] E.g. *Certain Expenses of the United Nations Case*, ICJ Rep (1962), p. 159; *South West Africa Cases*, ICJ Rep (1966), pp. 3, 48. See also: R. Jennings, A. Watts (eds), *Oppenheim's International Law*. 9th edition. Vol. I. Parts 2 to 4, Oxford 2008, p. 1271 ff.

[25] E.g. *Rights of United States Nationals in Morocco Case,* ICJ Rep (1952), pp. 196, 199.

[26] R. Jennings, A. Watts (eds), *op. cit.*, p. 1275.

[27] The first maritime navigation satellite system (NAVSAT, also called TRANSIT) was developed in the USA in 1958 by the Defense Advanced Research Projects Agency (DARPA) and the Applied Physics Laboratory of Johns Hopkins University to provide accurate location information to the US Navy in relation to its ballistic missile submarines. Subsequently, NAVSAT was also used as a navigation system by the US Navy's surface ships.

[28] On 24 January 1978, COSMOS 954, a Soviet nuclear-powered surveillance satellite, crashed in the Northwest Territories. The crash scattered an enormous amount of radioactivity

in space activities differ in the interpretation of terms used in the Liability Convention and in understanding the definitions contained therein. Canada's claim against the Soviet Union for compensation for damages caused by the re-entry and crash in 1978 of the Soviet satellite, Cosmos 954, was based primarily on the Liability Convention.[29] It gave rise to several legal issues concerning the interpretation of this convention, e.g. there were different views about the material scope of the concept of "damage" under Article I(a) of the Liability Convention,[30] although it was obvious that the Soviet satellite fell on to the territory of Canada and caused the immediate damage.

Most authors have no doubts that the Liability Convention applies only to direct physical damage resulting from the fall or collision of space objects and their material parts. According to Kerrest and Smith, "[t]here is no legal presumption as to the size and use of a space object…Whether a space object must be tangible or material is equally relevant. The growth of satellite technology dependent on signals and emissions, notably on the context of satellite navigation services, is a case in point. Liability for electromagnetic waves and laser beams are non-tangibles and their classification as space objects a pending issue"[31].

Although, there are also some authors who consider a broader interpretation of the term "parts of a space object". They suggest that damage caused by the signals (electromagnetic waves) submitted by the satellites is also ruled by the Liability Convention.[32] They rely on the *travaux préparatoires*[33] of the Liability Convention and "the victim-oriented character of the Convention as stated in its preamble".[34] According to Article 32 of the Vienna Convention the preparatory work of the treaty is one of the supplementary means of interpretation and it should be considered together with the circumstances of its conclusion, in order to confirm the meaning resulting from the application of Article 31 or to determine the meaning when the interpretation according to Article 31: (a) leaves the meaning ambiguous or obscure; or (b) leads to a result which is manifestly absurd or

over a 124,000 square kilometre area in Canada's north. The clean-up operation was a coordinated event between the United States and Canada.

[29] Protocol between the Government of Canada and the Government of the Union of Soviet Socialist Republics, Department of External Affairs Communiqué, No. 27, 2 April 1981. The settlement was based on a number of considerations including past lump sum settlements, the desirability of prolonging negotiations, and the various political considerations surrounding the negotiations.

[30] For the purpose of the Convention the term "damage" means loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical, or property of international intergovernmental organizations.

[31] A. Kerrest, L.J. Smith, 2009, *op. cit*., p. 140.

[32] C. Q. Christol, *International Liability for Damage Caused by Space Objects*, 'The American Journal of International Law' 1980, Vol. 74(2), p. 362.

[33] It is the record of the negotiations preceding the conclusion of a treaty. The International Court of Justice has confirmed the usefulness of recourse to them.

[34] M. Chatzipanagiotis, K. Liperi, 2017, *op. cit.*, p. 165.

unreasonable. It seems that possibly Article 31(a) could be raised by those authors who underline that the term "parts of a space object" is "ambiguous".

On the other hand, as Chatzipanagiotis and Liperi note, "[i]n general, satellite signals are not considered products, but a form of service provision. Thus, there would be a case of improper service provision, which is usually a form of contractual liability, often subject to liability limitations and waivers. However, should the user present an extra-contractual claim against the satellite operator, the legal basis could be product liability, by analogy to liability for aeronautical charts".[35] It seems that that "a form of service provision" cannot be regarded as "parts of a space object".

However, in any case the nexus between the damage and the space object or its component parts must be established. Damage related to the operation of global satellite navigation systems can be caused by various reasons, e.g. as a result of the launch of a navigation satellite or satellites into space and their failure or collision with another space object (such accidents may also negatively affect the operation of the entire satellite navigation system). When it comes to damage in orbit it may be very difficult to obtain evidence of its causes, given that proof of fault is needed. The damage may be also due to "inadequacies" of the navigation technology in areas where stringent safety requirements play an important role, such as those in air transport or force majeure (as it has been stated above). A pilot, during the approach to landing and during the landing itself, must have the reliability of the signal guaranteed (i.e., confidence that it is error-free – GPS currently does not provide a sufficient level of reliability). The signal can be also "intercepted" and retransmitted on the same frequency with much greater power (satellite navigation systems are vulnerable to misuse by hostile groups). In such a situation the nexus will be even more difficult to establish.

III. FUTURE LEGISLATION

It should be stressed that, to date, no multilateral international law agreements have been developed which specifically regulate the numerous issues associated with satellite technologies and their applications[36], including satellite navigation.

However, the development of space activities resulted in attempts to regulate primarily the issue of responsibility for actions taken in connection with satellite technologies applications. Unfortunately, the results of these efforts are not satisfactory. The UN General Assembly has adopted sets of rules by way of

[35] *Ibidem,* p. 173.

[36] K. Karski, K. Myszona-Kostrzewa, *Space Activities: Economic and Legal Aspects*, 'Finance India' 2020, Vol. XXXIV, No. 1, p. 62.

resolutions (which are non-binding acts) concerning two specific types of space activities: direct satellite television and remote sensing of the Earth: Resolution 37/92 on Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting of 1982[37] and Resolution 41/65 on Principles Relating to Remote Sensing of the Earth from Outer Space of 1986.[38] They do not include any provisions relating to international liability there.

The crash of Cosmos 954 raised international policy questions. Soon after the satellite's crash, there was a call from the United States to prohibit satellites containing radioactive material from orbiting the earth. This was followed by similar calls from Canada and states in Europe. In November 1978, the UN authorized its COPUOS to set up a working group to study nuclear-powered satellites. The General Assembly adopted Resolution 47/68 on the Principles Relevant to the Use

[37] A/RES/37/92. According to principle F of Resolution 37/92, states should bear international responsibility for activities in the field of international direct television broadcasting by satellite carried out by them or under their jurisdiction and for the conformity of any such activities with the principles set forth in this document. This means that states should consistently bear responsibility for actions in the field of direct satellite television, not only of governmental institutions, but also of non-governmental legal persons (international responsibility for activities carried out in this area by international intergovernmental organizations should be borne both by the organization and by the states participating in it). It is a construction based on Art. VI of the Outer Space Treaty of 1967. The slow pace of work on Resolution 37/92 and the lack of unanimity in adopting it prompted international lawyers dealing with this subject to put forward the thesis that the above resolution has no chance of "becoming the basis for shaping common customary norms" (Z. Galicki, 1991, *op. cit.*, p. 47).

[38] A/RES/41/65. According to the Principle XIV of the Resolution 41/65 states operating remote-sensing satellites shall bear international responsibility for their activities and ensure that such activities are conducted in accordance with the principles contained in this resolution and the norms of international law, irrespective of whether such activities are carried out by governmental or non-governmental entities or through international organizations to which such states are parties. It was also confirmed at the beginning of this principle that it complies with Art. VI of the Outer Space Treaty of 1967, and it was emphasized in its conclusion that it does not prejudge the possibility of applying the norms of international law to the responsibility of states for remote sensing activities. However, it seems significant that immediately after reaching a consensus in the LS as to the content of principle XVI, the USSR delegation interpreted this principle in the spirit of Art. VI of the 1967 Outer Space Agreement recognizing that the state is responsible for all aspects of remote sensing activities. Representatives of Western countries, however, believed that it was unacceptable to transfer the regime of responsibility specified in Art. VI of the space system for typical terrestrial activities. The dispute concerned both the assessment of the scope of the state's responsibility based on Art. VI, as well as the principle of state responsibility itself. Nevertheless, it seems that the importance of this resolution is increased by the fact that it was adopted by *consensus*. It is worth recalling that the issue of responsibility for remote sensing activities was previously regulated at the regional level – in the Convention on the Transfer and Use of Data of the Earth from Outer Space, signed in Moscow on 19 May 1978. A/33/162. Art .VI of the Convention lays down that the Contracting Parties shall bear responsibility for national activities in the use of data of the remote sensing of the Earth from outer space relating to the territories of other Contracting Party.

of Nuclear Power Sources in Outer Space.[39] Its Principle 9, Liability and compensation, imposes the same international liability as that contained in Article VII of the Outer Space Treaty and in the Liability Convention, with a corresponding duty to compensate for damage caused by a space object or its component parts.[40] Although the UN General Assembly Resolution 47/68 does not apply to application of space technologies, it is worth mentioning because also, in relation to satellite navigation, a resolution of the UN General Assembly, including the issue of liability, would provide a proper introduction to further codification activities in this area. Skubiszewski even states that "usually a resolution is more appropriate than a treaty when it's about drawing a line of action. The next step is to implement the procedures in the form of binding legal norms".[41]

At this point, however, it cannot be overlooked that none of the resolutions mentioned above led to the creation of binding norms of international law. In the case of satellite navigation, there is some hope that, unlike other space activities, it has so many applications in various areas that states will have to address the issue of international liability. The above resolutions also indicate the goals that states will try to achieve in possible future legal regulations.

The international community, in search of proposals for legal regulations of space technologies' application may turn to international organizations (such as the UN's specialized agencies) which are interested in the development of GNSS. The UN's specialized agencies are also amongst bodies considered to be capable of preparing detailed legislation on the practical applications of satellite navigation in specific areas, such as air transport or maritime navigation. Such agencies

[39] RES 47/68, adopted with outvote.

[40] *Ibid*., 1. In accordance with Article VII of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and the provisions of the Convention on International Liability for Damage Caused by Space Objects, each State which launches or procures the launching of a space object and each State from whose territory or facility a space object is launched shall be internationally liable for damage caused by such space objects or their component parts. This fully applies to the case of such a space object carrying a nuclear power source on board. Whenever two or more States jointly launch such a space object, they shall be jointly and severally liable for any damage caused, in accordance with article V of the above-mentioned Convention. 2. The compensation that such States shall be liable to pay under the aforesaid Convention for damage shall be determined in accordance with international law and the principles of justice and equity, in order to provide such reparation in respect of the damage as will restore the person, natural or juridical, State or international organization on whose behalf a claim is presented to the condition which would have existed if the damage had not occurred. 3. For the purposes of this principle, compensation shall include reimbursement of the duly substantiated expenses for search, recovery and clean-up operations, including expenses for assistance received from third parties.

[41] K. Skubiszewski, *Non-binding Resolutions and the Law-Making Process*, 'Polish Yearbook of International Law' 1986, Vol. XV, p. 160.

are the International Civil Aviation Organization (ICAO)[42] and the International Maritime Organisation (IMO).[43]

The ICAO' Council establishes international standards and recommends good practices and other guidance applicable to the use of GNSS for civil aviation under Article 37 of the Chicago Convention on International Civil Aviation of 1944.[44] Specific provisions of Articles 15, 22 to 28 of the Chicago Convention may also apply to satellite navigation systems introduced into civil aviation transport. In 1995, the ICAO' Council established the Panel of Legal and Technical Experts on the Establishment of a Legal Framework with Regard to GNSS, which prepared a draft of the Charter on the Rights and Obligations of States Relating to GNSS Services.[45] In 2008, the ICAO's Legal Committee (during its 33rd Session) accepted a draft of a Framework Agreement between the Governments concerning the Implementation, Provision, Operation and Use of a Global Navigation Satellite System for Air Navigation Purposes.

In 1997, also the IMO Assembly adopted Resolution No. A.860(20)[46] defining the IMO's policy towards future global navigation satellite system. This Resolution was replaced by Assembly Resolution A.915(22) of 29 November 2001,[47] which stressed the need to introduce GNSS, under international control, to shipping worldwide. It was also noted that progress in the work carried out by the International Civil Aviation Organization on the requirements for the use of GNSS in air transport was to be monitored. The IMO was granted the right to monitor and control the adaptation of signals processed by users' receivers to operational requirements and was recognized as competent to assess GNSS, in relation to maritime navigation, in terms of the system's compliance with the requirements for positioning equipment. With regard to GNSS devices, a number of resolu-

[42] ICAO is funded and directed by 193 national governments to support their diplomacy and cooperation in air transport as signatory states to the Chicago Convention (1944). Annex 10: Aeronautical Telecommunications to the Chicago Convention on International Civil Aviation of 1944 defines a GNSS as "a worldwide position and time determination system that includes one or more satellite constellations, aircraft receivers and system integrity monitoring, augmented as necessary to support the required navigation performance for the intended operation."

[43] IMO was established in the Convention on the International Maritime Organization signed on 6 March 1948; it came into force on 17 March 1958. Currently, the IMO has 174 Member States and three Associate Members; *Member States, IGOs and NGOs*, IMO, http://www.imo.org/en/About/Membership/Pages/Default.aspx (accessed 10.06.2018).

[44] The Council gives continuing direction to the work of ICAO. In this regard, one of its major duties is to adopt international Standards and Recommended Practices (SARPs) and to incorporate these as Annexes to the Chicago Convention. The Council may also amend existing Annexes as necessary.

[45] The Assembly Resolution A32-19.

[46] Resolution A.860(20) adopted on 27 November 1997, Maritime Policy for a Future Global Navigation Satellite System (GNSS).

[47] Resolution A.915(22) Adopted on 29 November 2001, Revised Maritime Policy and Requirements for a Future Global Navigation Satellite System (GNSS).

tions have been adopted by one of the IMO's committees – the Maritime Safety Committee (MSC)[48] – which deals with all matters related to maritime safety and maritime security involving both passenger ships and all kinds of cargo ships.[49] MSC's Resolution 401(95) (adopted on 8 June 2015) on Performance Standards For Multi-System Shipborne Radio-navigation Receivers[50] recommended that Governments ensure that multi-system shipborne radio-navigation receivers installed on or after 31 December 2017 perform to standards not inferior to those specified in the Annex to the Resolution.

In 2009 the European Space Policy Institute issued a document titled "Policy Aspects of Third Party Liability in Satellite Navigation"[51] in which it was stated that third party liability regime must be based on the principles of strict liability (i.e. it is the duty of the operator to prove that it is not liable) and limited liability (i.e. liability is limited to a predetermined amount) in order to ensure a fair compensation to victims. It can constitute a valuable clue for future work on regulating the international liability for damage caused by satellite navigation signals.

IV. CONCLUSIONS

While at the beginning of the space age, activities in space were associated only with states, the development of space technology applications to a large extent changed this situation.

Satellite navigation systems and their application have become the basis for the functioning of many sectors of the global economy. However, there is still

[48] IMO Assembly Resolution No. A.819(19). Performance Standards for Shipborne Global Positioning System (GPS) Receiver Equipment, 23 November 1995, as amended by MSC Resolution No. 112(73) of 1 December 2001; MSC Resolution No. 53(66) of 30 May 1996. Performance Standards for Shipborne GLONASS Receiver Equipment, as amended by MS. C Resolution No. 113(73) of 1 December 2000; MSC Resolution No. 74(69) of May 12, 1998. Adoption of New and Amended Performance Standards, as amended by MSC Resolution No. 115(73) of 1 December 2000; MSC Resolution No. 64(67), Annex 2, of 4 December 1996, on Recommendation on Performance Standards for Shipborne DGPS and DGLONASS Maritime Radio Beacon Receiver Equipment (Annex 2); as amended by MSC Resolution No. 114(73) of 1 December 2000; MSC Resolution No. 233(82) of 5 December 2006. Adoption of the Performance Standards for Shipborne Galileo Receiver Equipment; MSC Resolution No. 379(93) adopted on 16 May 2014; Adoption of the Performance Standards for Shipborne BeiDou Satellite Navigation System (BDS) Receiver Equipment.

[49] *Maritime Safety Committee*, IMO, https://www.imo.org/en/MediaCentre/MeetingSummaries/Pages/MSC-Default.aspx (accessed 20.01.2023).

[50] MSC Resolution No. 401(95), Annex 17, of 8 June 2015.

[51] A. Roma, K-U. Schrogl, M. Sanchez Aranzamendi (eds), *Policy Aspects of Third Party Liability in Satellite Navigation*, July 2009, ESPI, https://www.espi.or.at/wp-content/uploads/espidocs/Public%20ESPI%20Reports/espi_report_19.pdf (accessed 14.02.2023).

not an international binding obligation of the GNSS' owners preventing them from limiting or complete shutdown of signals available to civilian users. Indication as beneficiaries of space activities – all countries (the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind) contained in the Outer Space Treaty is not a viable obligation, but rather a general statement. Thus, in the event of discontinuation of the provision of satellite navigation services by their owners, international law does not actually provide the recipients of these services with any effective instrument enabling them to assert their rights. The jamming of the satellite navigation signal, accompanied by a violation of the provisions relating to the frequency band allocated to the states' providers may be considered illegal, but there are no sanctions corresponding to the frequency allocated to them.

It seems that the present regulations of the Outer Space Treaty and the Liability Convention do not apply to satellite navigation and do not cover the damage caused by navigation intangible signals. Unfortunately, it is rather clear that in the near future the international community is not likely to adopt uniform rules on satellite navigation signal liability. It causes great legal uncertainty.

The authors of the document "Policy Aspects of Third Party Liability in Satellite Navigation" rightly point out that "[f]rom the analysis of the premises of the possible solutions concerning the liability deriving from GNSS, it emerges that the proper legal framework for a uniform regime of GNSS TPL is an international convention of uniform law. The need of such instruments is mainly due to the fact that such regime implies mandatory rules and may not depend on acts of private autonomy not being capable: i) to protect victims of incidents in a specific field characterised by a high risk factor, and ii) to introduce an element of certainty in the discipline of compensation of huge damages". The United Nations and its Committee on the Peaceful Uses of Outer Space are the best platform to work on establishing the principles governing the issue of liability for damage caused by malfunctioning of satellite navigation systems and their signals.

REFERENCES

Cheng B., *Article VI of the 1967 Space Treaty Revisited: "International Responsibility", "National Activities", and "The Appropriate State",* 'Journal of Space Law' 1998, Vol. 26(1)

Dunk von der F.G., *Liability for Global Navigation Satellite Services: A Comparative Analysis of GPS and Galileo,* 'Journal of Space Law' 2004, Vol. 30(1)

Galicki Z., *Rozwój zasad odpowiedzialności międzynarodowej za działania kosmiczne,* (in:) A. Wasilkowski (ed.), *Działalność kosmiczna w świetle prawa międzynarodowego,* Warsaw 1991

Gerhard M., *Article VI,* (in:) S. Hobe, B. Schmidt-Tedd, K.-U. Schrogl (eds), *Cologne Commentary on Space Law,* Cologne 2009

Grochalski S. M., *Działania organizacji międzynarodowych w przestrzeni kosmicznej*, (in:) A. Kozłowski, B. Mielnik (eds), *Odpowiedzialność międzynarodowa jako element międzynarodowego porządku prawnego,* Wrocław 2009

Grzegorczyk M., *Odpowiedzialność za szkody kosmiczne,* 'Nowe Prawo' 1972, No. 11

Hobe B., Schmidt-Tedd B., Schrogl K.-U. (eds), *Cologne Commentary on Space Law,* Cologne 2009

Kerrest A., Smith L. J., *Article VII*, (in:) S. Hobe, B. Schmidt-Tedd, K.-U. Schrogl (eds), *Cologne Commentary on Space Law,* Cologne 2009

Kozłowski A., Mielnik B. (eds), *Odpowiedzialność międzynarodowa jako element międzynarodowego porządku prawnego,* Wrocław 2009

Lachs M., *Czy kryzys prawa międzynarodowego?,* 'Państwo i Prawo' 1992, No. 2

Lachs M., *Przestrzeń kosmiczna – nowy wymiar prawa międzynarodowego,* 'Państwo i Prawo' 1966 , No. 3

Lachs M., *Some Reflections on the State of the Law of Outer Space,* 'Journal of Space Law' 1981, Vol. 9(1-2)

Lachs M., *Tendencje rozwojowe prawa kosmicznego,* 'Postępy Astronautyki' 1978

Lachs M., *The Law of Outer Space. An Experience in Contemporary Law – Making,* Leiden 1972

Menkes J., *Stopniowy rozwój prawa odpowiedzialności organizacji międzynarodowych – wybrane problemy,* (in:) A. Kozłowski, B. Mielnik (eds), *Odpowiedzialność międzynarodowa jako element międzynarodowego porządku prawnego,* Wrocław 2009

Mikos-Skuza E., *Odpowiedzialność za praktyczne zastosowania techniki kosmicznej w świetle międzynarodowego prawa publicznego*. Manuscript of a doctoral thesis available in the resources of the Library of the Faculty of Law and Administration of the University of Warsaw

Myszona-Kostrzewa K. (ed.), *Legal and Political Aspects of the Use of European Satellite Navigation Systems Galileo and Egnos,* Warsaw 2018

Myszona-Kostrzewa K., *Nawigacja satelitarna w świetle prawa międzynarodowego*, Warsaw 2011

Rajski J., *Odpowiedzialność międzynarodowa za szkody wyrządzone przez obiekty kosmiczne*, Warsaw 1974

Skubiszewski K., *Non-binding Resolutions and the Law-Making Process*, 'Polish Yearbook of International Law' 1986, Vol. XV

Sonnenfeld R., *Podstawowe zasady odpowiedzialności międzynarodowej państwa*, (in:) R. Sonnenfeld (ed.), *Odpowiedzialność państwa w prawie międzynarodowym,* Warsaw 1980

Wouwer Van De J.L., Lambert F., *European Trajectories in Space Law,* Brussels 2008

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THE "LIABILITY CONVENTION" IN A CLASH WITH PRACTICE – EXAMPLE OF THE "KOSMOS 954" SATELLITE

Abstract

The article examines the settlement of international claims and disputes arising from faulty nuclear-powered satellites which fall on another state's territory. The author analyzes diplomatic relations between the USSR and Canada and the content and legal settlement of the international dispute resulting from the Soviet Cosmos-954 satellite disintegrating on Canadian territory. The author concludes that the 1971 Convention on International Liability for Damage Caused by Space Objects was adopted within the appropriate time-frame, and that it forms a reliable foundation for the settlement of conflicts between the States in this area. However, the 1981 bilateral agreement "Settlement of the Claim between Canada and the Union of Soviet Socialist Republics for Damage Caused by "Cosmos 954"" showed that it has never been utilized. This contravenes the international treaty regulating international liability for damage caused by space objects. Therefore, the biggest question of all materializes here: did the international community need space law? Even though it is the newest branch of public international law, it is almost 60 years old. This period of time (more than half a century) has only seen it in academic discussions on how states should abide by it. The lack of relevant case law is a good and bad thing at the same time. Bad – because we still do not know how international courts and tribunals will apply norms of space law. Good – because up until now we have not experienced an international conflict that states have not been able to solve by diplomatic measures.

KEY WORDS

"Cosmos-954" satellite, space crash, space damage, liability for space activities, "Morning Light" operation, international dispute resolutions

SŁOWA KLUCZOWE

satelita "Cosmos-954", katastrofa kosmiczna, szkoda kosmiczna, odpowiedzialność za szkody kosmiczne, operacja „Morning Light", rozwiązywanie sporów międzynarodowych

1. THE BACKGROUND OF THE "ЛЕГЕНДА" (LEGEND) SYSTEM

The question of artificial satellites' energy source was raised after the very first satellite launch, and it was proposed that satellites operating at low altitude should be equipped with nuclear reactors because not all devices could effectively use solar panels.

One of the most serious problems of optical reconnaissance was, and still is, the impossibility of direct observation of ground objects uninterrupted for every 24-hour period and in all weather conditions. Therefore, orbital radar systems were developed immediately after the implementation of programs to create the USSR and USA military satellite constellations.[1]

"Legend" (GRAU[2] index - 17K114) was a system of the global satellite Marine Space Reconnaissance and Target Designation (МКРЦ) for Soviet Navy operation in 1978-2006. The system enabled monitoring and subsequent prediction of tactical situations in oceans, and the transmission of information in real time to ships, submarines and ground stations.

However, the short service life of an active satellite predetermines the episodic nature of its work, and the "Legend" system was developed to replace the obsolete aviation marine radar targeting system called "Success".

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[1] I. Afanas'yev, *Kistorii razrabotki sputnikov morskoy radiorazvedki*, 'Novosti Kosmonavtiki' 2007, No. 1, p. 20, https://warspot.ru/17979-zvezda-polyn (accessed 18.01.2023).

[2] Index of the department of the Ministry of Defense. Conventional alphanumeric designation of a sample of weapons and military equipment assigned by one of the Ordering Departments of the Ministry of Defense of the USSR and Russia.

The lead developer was 'Experimental Design Bureau No. 52 (ОКБ-52)'[3] established under the leadership of Vladimir Chelomey.[4] Political upheavals and reforms in the rocket and space industry then led to the August 1965 change, when the process was newly-headed by the Leningrad Arsenal Design Bureau, named after M.V. Frunze,[5] and led by Evgeny Ivanov.

It was decided that the "Legend" had two device types: the radar reconnaissance US-A (Active Reconnaissance Satellite, GRAU: 17Ф16К) and the radio intelligence US-P (Passive Reconnaissance Satellite). The navy gave these devices the following nicknames: the first was "Thin" because of its elongated cylindrical shape, and the second was named "Flat" after its wide solar panels.[6] In the final version, the project of the Marine Space Reconnaissance and Target Designation provided a "non-stop" survey of global oceans by grouping seven vehicles: four US-As and three US-Ps. The satellites were programed to collect information on "probable enemy" fleet movements, and transmit it to the ground station and directly to warships and submarines on duty in the ocean.[7] This surveillance was used to target the Cruise-missile submarine projects (SSGN) armed with P-700 "Granit" missiles with a flight range far exceeding the range of their own detection and target capabilities.

The US-P spacecraft searched and identified surface targets without radar irradiation, and registered them only by intercepted signals characteristic for a particular type of ship. The US-P equipment was then operated by solar power plants with buffer batteries.[8]

In contrast, an important feature of the US-A spacecraft was that it used the "Chaika-seagull" one-way-side-view radar station to detect enemy fleets. This required a lot of energy, and solar panels were difficult to use because the radar required more efficient operation. Therefore, it had to be in a relatively low 240-270 km orbit. In addition, the atmospheric influence still imposed on the panels would slow down the satellite and take it out of orbit too early.[9] The radar would also have to be turned off in the earth's "shadow". These combined prob-

[3] Joint Stock Company ""Military-Industrial Corporation" Scientific and Production Association of Mashinostroeniya".

[4] S. Gorove, *Cosmos 954: Issues of Law and Policy*, 'Journal of Space Law' 1978, No. 6(137); N.F. Krasnov, *Aerodinamika otryvnykh techeniy*, Moscow 1988, p. 113.

[5] Nowadays Russia is one of the leading developers and manufacturers of space technology, naval artillery and launchers.

[6] O. Kaptsov, *Morskaya kosmicheskaya sistema razvedki i tseleukazaniya*, Voyennoye obozreniye, 20.03.2012, https://topwar.ru/12554-morskaya-kosmicheskaya-razvedka-celey.html (accessed 18.01.2023).

[7] A. Zemlyanov, G. Kossov, V. Traube, *Sistema morskoy kosmicheskoy razvedki i tseleukazaniya (istoriya sozdaniya),* Sankt Petersburg 2002, p. 84.

[8] M. Tarasenko, *Voyennyye aspekty sovetskoy kosmonavtiki*, Moscow 1992, p. 71.

[9] See more in: V.S. Verba (ed.), *Radiolokatsionnyye Sistemy Zemleobzora Kosmicheskogo Bazirovaniya*, Moscow 2010.

lems led the designers to equip the craft with a nuclear power plant with homogeneous fast neutron reactor and thermoelectric generator.[10]

Work on the creation of a nuclear installation, which later received the designation BES-5 (Onboard Power System No. 5) and "Buk-Onboard space installation", was determined by the resolutions of the Central Committee of the CPSU and the Council of Ministers of the USSR No. 258-110 on 16 March 1961[11] and No. 702-295 of 3 July 1962.[12]

The appointed responsible executor was the Experimental Design Bureau No. 670 (OKB-670), headed by Mikhail Bondaryuk and under the scientific leadership of the Physics and Energy Institute (PEI).[13] Work on the space nuclear power plant was much more difficult than expected, and a large team of specialists were soon working on the project. This included the Moscow Design Bureau "Krasnaya Zvezda-Red Star" with part of the OKB-670 team, the "Istok-source" Scientific and Technical Center and the Institute of Atomic Energy and other enterprises.[14]

The mass of the US-A satellites was approximately 4 tons, and 1,250 kg of this was in the nuclear power plant. They had a cylindrical shape with a 1.3-m diameter and the length of 10 m, and the radiation safety was provided by two systems:

(1) the main system took the nuclear power plant into a long-term "burial" orbit at 750-1000 km height, with the help of a special solid-fuel propulsion system. Calculations determined that the lifetime of objects in the "burial" orbit is at least 250 years;[15]

(2) a duplicate system was based on the destruction of the reactor from aerodynamic heating in the upper atmosphere.

The US-A flight design tests began by launching simplified vehicles without nuclear installations or radar stations. The "Cosmos-102" (28 December 1965) and "Cosmos-125" (20 July 1966) satellites were launched using a modified two-

[10] O, Makarov, *Ye rakety i kosmicheskaya razvedka: ubiytsy avianostsev, Techinsider*, Voyennaya aviatsiya, 28.04.2020, https://www.techinsider.ru/weapon/182371-razvedchik-na-bystrykh-neytronakh/ (accessed 18.01.2023).

[11] Decree of the Central Committee of the CPSU and the Council of Ministers of the USSR on the development of work on anti-satellite defense and space exploration, No. 258-110, 16 March 1961, https://www.kosmonavtika.com/bibliographie/documents/258-110.pdf (accessed 18.01.2023).

[12] A.A. Bashlakova (ed.), *Severnyy kosmodrom Rossii*. Vol. 1., Plesieck 2007, p. 45.

[13] V. Pupko, *Istoriya rabot v FEI po razrabotke i sozdaniyu YARD i kosmicheskikh YAEU, 50 let FEI*, Obninsk 1996, p. 205.

[14] O.A. Gubeladze, R.A. Goncharov, *Zashchita vozvrashchayemoy chasti kosmicheskogo apparata, Izvestiya vuzov. Severo-Kavkazskiy region*, 'Yestestvennyye nauki. Prilozheniye' 2006, No. 1, p. 38.

[15] A.A. Kulandin, S.V. Timashev, I.V. Zaytsev, *Energeticheskiye sistemy kosmicheskikh apparatov*, Moscow 1994, p. 127.

stage launch vehicle of the "Vostok" type (11A510), with additional orbit-launch from the spacecraft's own propulsion system.

"Cosmos-954" became the 20th Soviet satellite with a nuclear power source.[16] Many accidents occurred over 10 years of use of these devices. Two "Cosmos"-line satellites returned to Earth in emergency conditions in 1969, one failed at launch in 1973 and a further incident occurred in 1975. However, the program continued, despite the risk of radioactive contamination of the territory in the event of a fall.[17]

2. LAUNCH AND CRASH OF THE "COSMOS-954" SATELLITE

The next US-A under the name "Cosmos-954" was launched by the Cyclone-2 carrier rocket at the Baikonur cosmodrome on 18 September 1977. This was in standard configuration with the Buk nuclear power plant-series No. 58, and it began working in tandem with "Cosmos-952" which launched two days earlier. However, it lost orientation in space and ground service control on 28 October 1977. The command sent to take the reactor compartment into "burial" orbit did not arrive, and uncontrolled descent began as it was breaking-up in the higher atmosphere. Although the precise causes of the accident are still unknown, the corrective propulsion system software most likely failed.[18]

The TASS Russia News Agency report on the "Cosmos-954" satellite launch in the "Pravda-truth" newspaper translates to the following: "On 18 September 1977, the next artificial satellite to orbit the Earth is "Cosmos-954". It was launched in the Soviet Union, with scientific equipment designed to continue space exploration installed on board the satellite. The satellite is put into orbit with the following parameters:

– Initial circulation period – 89.6 minutes;

– The maximum distance from the Earth's surface (at apogee) is 277 kilometres;

– Minimum distance from the Earth's surface (at apogee) is 259 kilometres;

– The inclination of the orbit is 65 degrees."

The TASS article continued, "In addition to scientific equipment, the satellite has a radio system for accurate measurement of orbital elements and a radio telemetry system for transmitting operational data on instrument and scientific

[16] A.B. Zheleznyakov, *Tayny raketnykh katastrof: plata za proryv v kosmos*, Moscow 2004, p. 239.

[17] M. Dolphin, "*Cosmos 954" and its Unlikely Journey to the NWT 35 Years Ago*, Hay River Hub, 9 April 2013, http://www.hayriverhub.com/2013/04/kosmos-954-and-its-unlikely-journey-to-the-nwt-35-years-ago2013 (accessed 28.01.2023), p. 38.

[18] A. Zheleznyakov, *Avariya sputnika "Kosmos-954",* 'Sekretnyye Materialy' 2004, No. 19, p. 33.

equipment back to Earth. The equipment installed on the satellite is working normally, and the coordination and computing centre is processing the incoming information".[19]

The situation worsened on 28 October and 6 January 1978 when the spacecraft depressurized, and this caused its accelerated fall. The Americans concluded from the changes in satellite motion that it would enter the dense atmospheric layers by the end of January 1978. Meanwhile, the Soviet experts hoped that "Cosmos-954" would be brought down somewhere in the ocean, but could not say exactly where the debris would fall. Subsequent reports compared this to the "Russian roulette".[20]

The United States then contacted the Soviet government through diplomatic channels on 12 and 17 January and requested accurate information about "Cosmos-954". The answers received were laconic: "the satellite's nuclear installation runs on uranium-235, the design provides for the complete disintegration of the reactor in the dense atmosphere layers and the pollution of the area will be minimal and require just the implementation of standard remediation measures".[21]

On 18 January, the governments of NATO countries and Australia, New Zealand, Japan and Canada received a message from the United States about the "Cosmos-954" problem, with the recommendation to be careful when detecting fragments of the Soviet apparatus. However, the American emergency specialists stressed that they considered it unnecessary to warn the population in advance because of the uncertainty of the "landing" location. Incredibly, all governments agreed to remain silent, and until the fall of Sputnik, not a single head of state ever mentioned the possibility of an atomic explosion, which politicians did not rule out, despite reassurances from the Soviet Union.[22]

On 24 January 1978, at 6:53 a.m. Ottawa time (11:53 UTC), a red-hot object appeared in the sky over south-western Canada.[23] Twenty-two minutes later, President Jimmy Carter informed the Canadian Prime Minister Pierre Elliott Trudeau that a Soviet satellite had crashed in northern Canadian territory, and he offered to help collect the wreckage. Later it became known that debris fell over a 600 km

[19] «Kosmos-954». Soobshcheniye TASS, Pravda Newspaper, 20.09.1977.

[20] A. Zheleznyakov, *Yadernoye sozvezdiye: istoriya sozdaniya i ekspluatatsii otechestvennykh kosmicheskikh apparatov s yadernymi energeticheskimi ustanovkami*, 'Atomnaya Strategiya XXI' 2004, No. 9, p. 31.

[21] I. Fedik, *Yaderno-kosmicheskaya energetika, Istoriya sovetskogo atomnogo proyekta (1940–1950)*, Vol .3, Moscow 1996, p. 90.

[22] R.L. Grasty, *The Search for COSMOS-954*, 'Search Theory and Applications' 1980, pp. 211-220; V.S. Yartsev, *Krusheniye sovetskogo sputnika «Kosmos-954» i mezhdunarodnyye posledstviya*, Moscow 2018, p. 89.

[23] C.A. Morrison, *Voyage into the Unknown: The Search for and Recovery of Cosmos 954*, 'Archivaria' 1982, No. 17, p. 58.

long section: from the Great Slave Lake to Baker Lake. The total area of "pollution" was 124,000 km^2.[24]

Information about the incident finally reached the media, and this caused a great stir. For several days the media discussed what had happened, making the wildest accusations against the United States and the Soviet Union. For example, it was claimed that American aerospace defense shot down "Cosmos-954", and the satellite was not a research or reconnaissance satellite, but carried an atomic warhead.[25] The media tried to avoid panic by hiding the accident details, but panic gradually engulfed the world.[26]

The Soviet Main Intelligence Directorate (GRU) discussed the possibility of sending several special-forces teams to Canada to secretly collect and take away "Cosmos-954" fragments. But this idea was wisely abandoned, especially since American and Canadian specialists were actively working in the fall area.[27]

3. "MORNING LIGHT" OPERATION

On 24 January, the active phase of the recovery operation called "Morning Light" began. Its headquarters was at a military base in the Edmonton suburb in Alberta, Canada. It was first necessary to outline search zones for the "Cosmos-954" wreckage, and aircraft equipped with sensitive gamma spectrometers were then deployed.[28] The U-2 reconnaissance aircraft barraged at high altitudes, trying to detect plumes of uranium-235 and its decay products. Research showed that there were no traces of air contamination, but, all parts of the reactor recovered on the ground, including the smallest ones, had to be identified and fully tested, especially for radioactivity.[29]

Four SS-130 Hercules military transport aircraft from the Royal Canadian Air Force 435th Squadron were equipped to identify areas with excess natural radioactive background. From 24 January to 25 March, the pilots made 608 sorties and

[24] H.W. Taylor, E.A. Hutchison, K.L. McInnes, J. Svoboda, *Cosmos 954: Search for Airborne Radioactivity on Lichens in the Crash Area, Northwest Territories, Canada*, 'Science' 1979, Vol. 205(4413), pp. 1383-1385.

[25] M. Yuzbashyan, *Aktual'nyye mezhdunarodno-pravovyye voprosy razresheniya sporov v oblasti kosmicheskoy deyatel'nosti*, 'Pravo i Upravleniye. XXI Vek' 2018, No. 2(47), p. 50.

[26] *The Dangers of Cosmos 954*, 'The New York Times', 27 January 1978, p. 24.

[27] O.V. Yakovlev, *Sistemnyy analiz bezopasnosti i riska kosmicheskoy yadernoy energetiki*, 'Vestnik VGU. Seriya: Sistemnyy Analiz i Informatsionnyye Tekhnologii' 2011, No 2, p. 46

[28] E. Power, A. Keeling, *Cleaning up Cosmos: Satellite Debris, Radioactive Risk, and the Politics of Knowledge in Operation Morning Light*, 'The Northern Review' 2018, No. 48, p. 89.

[29] R. Dean, P. Whitney Lackenbauer (eds), *Operation Morning Light: An Operational History,* Antigonish, NS 2018, p. 30.

located wreckage sites from an average altitude of 300 meters. Mistaken sightings occurred because of complex data processing. For example, some search teams that followed specialist advice and landed in the tundra and on the frozen lakes returned with nothing. In addition, theorists believed the reactor core elements should form craters at least one meter in depth, but all attempts to find these elements ended in vain.[30]

A further problem was that the search was conducted in the harsh Arctic winter. Gamma-ray spectrometers and computer data processing constantly failed in the low temperatures, and ground teams experienced serious physical symptoms and psychological stress aggravated by radiophobia.[31]

The "Morning Light" Operation was suspended at the end of March, after more than a hundred fragments of radiating materials with a total mass of 65 kg were collected. The fragment radioactivity ranged from several milliroentgen an hour to 200 X-rays an hour. The recovered fragments of the reactor core were only 0.1% of this 65 kg mass. The preliminary report published in September 1978 concluded that the reactor "burned-down" in the atmosphere, and particles which settled in the desert Arctic regions had a diameter of less than a millimetre. These were then carried away by meltwater in April and May.[32]

The summary of the operations is divided into two temporal phases. The first phase was from 24 January 1978 to 20 April 1978 and the second from 21 April 1978 to 15 October 1978. The total costs were CAD 12,048,239.11 for the first phase and CAD 1,921,904.55 for the second

4. LIABILITY CONVENTION AND DIPLOMATIC MEASURES

The Soviet Union had to react in some way to what was happening, but high-ranking politicians remained silent. The scientists' comments supported politician demands to ban space research, quietly rebuke the Russians and impose sanctions on the USSR. The Soviet Union actions were discussed and condemned, and it was obvious that anti-Soviet hysteria had spiralled out of control. Moreover, it should have been clear to all scientists that the satellite would burn almost com-

[30] E.J.J. Power, *Memories of Mistrust and Contamination: The Legacies of Cosmos 954 and Operation Morning Light in Denendeh*, Master Thesis, Department of Geography and Planning, University of Toronto, 2019, https://tspace.library.utoronto.ca/bitstream/1807/98549/1/Power_Ellen_201911_MA_thesis.pdf (accessed 28.01.2023), pp. 15-16; G.A. Orlova, *Fiziki-yadershchiki v bor'be za pravo na kosmos,* 'Apokrif, Tekhnologos' 2018, No. 2, p. 120.

[31] Radiophobia – a fear of ionizing radiation.

[32] R.L. Grasty, *The Search for COSMOS-954*, (in:) K.B. Haley, L.D. Stone (eds), *Search Theory and Applications*, NATO Conference Series 1980, Vol. 8, p. 217.

pletely in the upper atmosphere without appropriate installation protection, and that only fragments would return to earth.[33]

The Canadian Department of External Affairs contacted the USSR Ambassador in Ottawa, in accordance with Article 5 in the 1968 Agreement on the Rescue of Astronauts, and the Return of Astronauts and Return of Objects Launched into Outer Space. The first Canadian diplomatic document stipulated that space-object components believed to be part of Cosmos 954 had been discovered on Canadian soil. They also notified the United Nations Secretary-General that Canada reserved its rights on liability and compensation for this incident under international law.[34]

The USSR remained silent on further Canadian communications on the 24 and 27 January 1978, and the Canadian Government therefore issued an Aide-Memoire requiring answers to technical questions about the Cosmos 954 debris. These included: (1) What was the amount and nature of the fuel's chemical and alloy composition?; (2) What was the reactor-fuel half-life?; (3) What shielding was used, and was there an alternative container which would have offered greater protection?; (4) What types of material, energy level and ionizing radiation spectrum would the Soviet authorities have expected if the remnants had landed on Soviet territory?; (5) Over what sized-area would debris have been distributed?, and (6) Is the reactor the same, or essentially similar to the "ROMASHKA-chamomile" reactor described by Pushkarsky and Okhotik in 'Review' 1971, Vol. 9, No. 2?[35]

The first official USSR Embassy reply to Canadian authorities was dated 20 February 1978. The Soviet regime regretted in it only that the search and removal of Cosmos-954 debris had occurred without their specialists' participation. This was quite illuminating, because the Canadian government had sent three queries which remained unanswered. Moreover, that Soviet communication illustrated that the USSR had no interest in any space objects discovered on Canadian territory - regardless of commitment to the above-mentioned Article 5 of the 1968 agreement.[36]

The next Canadian communique to the Soviet Embassy in Canada was sent one week later. This missive stressed Canada's concern about the risk of harmful effects from the satellite fragments, because some were highly radioactive. It also listed all the official communications sent to the Soviet Embassy, addressed the accusation of not inviting Soviet specialists to the search and informed the USSR of their intention to submit a claim for damages. This claim would include the search and recovery costs incurred by Canada for hazardous Soviet satellite components present on Canadian territory, and it would be filed in accordance with

[33] I. Fedik, 1996, *op.cit*., p. 88.

[34] Canadian Department of External Affairs Note of 8 February 1978.

[35] Canadian Aide-Memoire to Soviet Embassy in Ottawa of 8 February 1978.

[36] Note from the Embassy of the USSR at Ottawa – 20 February 1978.

international law and relevant international agreements. This included the 1972 Liability Convention, wherein Canada and the USSR are both parties.[37] A following Canadian government communication advised the Soviets that new spacecraft fragments had been discovered,[38] but the USSR Embassy stated again that they were not interested in anything found on Canadian soil, and Canada could deal with it as they wished.[39]

A further Canadian communique of 13 April 1978 requested additional technical information because the satellite weighed several tons and the reactor core was tens-of-kilograms. The sheer size posed problems about the amount and spread of subsequent radiation over Canadian territory.[40] Canada received an involved answer on the 31 of May. The Soviets answered those questions, but most importantly they added that Soviet specialists estimated that the level of external radiation would generally be safe for the Canadian population. They based this on Canada's transmitted information, and then advised that all searches would be immediately discontinued if a similar situation occurred on USSR soil.[41]

5. CLAIM AND SETTLEMENT

Canada presented its log of claims for USSR compensation for Cosmos 954 damages on the 23 January 1979. It is most important here that the Canadian Government did not file its claim under any particular legal norm. Instead, it vaguely conveyed that the claim was filed on the following basis: (1) the relevant international agreements, (2) the 1972 Convention on International Liability for Damage caused by Space Objects and (3) on general principles of international law.[42]

Canada's compensation claim was for CAD 6,041,174.70. This was presented without prejudice to Canada's right to additional claims for currently unidentified or undetermined damage, and for future population and ecological radiation from nuclear contamination.[43] It is quite strange, and therefore important, that this

[37] Note from the Department of External Affairs, 28 February 1978 (No. FLO-0497).

[38] Note from Department of External Affairs – 3 March 1978 (No. FLO-0532).

[39] Note from the Embassy of the Union of Soviet Socialist Republics at Ottawa of 21 March 1978.

[40] Note from the Department of External Affairs of 13 April 1978 (No. FLO-0840).

[41] Note of 31 May 1978 from the Embassy of the Union of Soviet Socialist Republics at Ottawa.

[42] J.A.B Note, *Convention on International Liability for Damage Caused by Space Objects: Definition and Determination of Damages After the Cosmos 954 Incident*, 'Fordham International Law Journal' 1984, No. 8, pp. 255-285.

[43] Claim Against The Union Of Soviet Socialist Republics For Damage Caused By Soviet Cosmos 954 (No. FLA-268), 23 January 1979.

claim presented to the USSR was 40% less than the actual 13,970,143.66 Canadian-dollar-cost for the two Morning Light recovery stages.

The international law stipulations relevant to compensation for damages starts with the Outer Space Treaty.[44] The essence of Treaty Article VII is that "each State Party to the Treaty that launches or procures the launching of an object into outer space is internationally liable for damage to another State Party to the Treaty". The Liability Convention[45] provides more detailed information on compensation. Article II states that "a launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft flight".

Moreover, the Canadian claim was also based on the general principles of international law. The principle of absolute liability applies to fields of activities with a common high degree of risk, and this is repeated in numerous international agreements and is one of "the general principles of law recognized by civilized nations" under ICJ Statute Article 38. This is accepted as a general principle of international law.[46] The Canadian damages calculation applied relevant criteria established by the general principles of international law, according to which fair compensation is to be paid. Therefore, its claim included only costs deemed reasonable, "proximately caused by the intrusion of the satellite and deposit of debris, and capable of being calculated with a reasonable degree of certainty".[47]

Canada and the USSR reached a compromise and signed a Claim Settlement on 2 April 1981 after very lengthy negotiations.[48] The Protocol was signed in Moscow by Canada's Ambassador to the USSR, Geoffrey Pearson and, on behalf of the USSR by N.S. Ryzhov, Deputy Minister of the Ministry of Foreign Affairs. This formal Protocol settled Canada's claim for damages caused by the "Cosmos 954" Soviet satellite disintegration over Canadian territory, and interestingly, the parties to the protocol used the term "disintegration", rather than "crash", "catastrophe" or "disaster".

The entire document had a very short text, consisting only of a preamble and 3 articles. The main stipulation was that the USSR pay three million Canadian dollars to the Canadian Government. This registered the payment in full, and the final settlement of all matters connected with the disintegration of the Cosmos 954 Soviet satellite in January 1978. It further registered that the Canadian Government accept this payment.

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[44] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 1967, Res. 2222 (XXI).

[45] Convention on International Liability for Damage Caused by Space Objects, 1971, Res. 2777 (XXVI).

[46] Annex A of the Claim.

[47] *Ibid.*

[48] B. Schwartz, M.L. Berlin, *After the Fall: An Analysis of Canadian Legal Claims for Damage Caused by Cosmos 954*, 'McGill Law Journal' 1981, No. 27, p. 676.

6. THE END OF THE "LEGEND"

The "Cosmos-954" disintegration and subsequent international scandal forced the US-A device developers to initiate additional security measures. A further system was introduced into the Buk installation. This was intended to separate the core from the reactor vessel if removal in the "burial" orbit failed. The core was to be destroyed by a "piston-type powder pressure accumulator". This would disintegrate radioactive materials into tiny fragments, so that larger particles could not return to Earth.[49]

The US-A launches resumed in April 1980. However, all eventualities could not be covered, and the "Cosmos-1266" on-board equipment failed on 28 April 1981 with the threat of uncontrolled descent from orbit. Fortunately, it was possible to transfer the reactor to the "burial" orbit on this occasion, but the device worked for only eight days. Similar problems occurred for the next "Cosmos-1299" satellite which was launched on 24 August 1981. This operation lasted only thirteen days, and therefore proved unacceptable to the space industry.[50]

The two launches of "Cosmos-1365" in May 1982 and "Cosmos-1372" in June the same year proved so successful that the USSR military considered deploying the "Legend" system full-time. This success, however, was over-shadowed by a further calamity. The "Cosmos-1402" satellite launched at the end of August 1982 failed on the 28 December that year. Attempts to transfer the Number-70 series nuclear power plant reactor to the "burial" orbit were unsuccessful, and uncontrolled descent began.

Fortunately, an additional radiation safety system worked perfectly, and this destroyed the active zone, so that the "Cosmos-1402" remnants entered the atmosphere over Ascension Island in the Atlantic Ocean on the 7 February 1983. The American space services recorded only a slight increase in natural background radiation in that area. Although no one was injured, this accident again forced the Soviet Union to suspend US-A launches for a year and a half. Launches then resumed on 29 June 1984 with "Cosmos-1579", and they continued regularly for four years.

The fully modernized US-AM "Cosmos-1900" spacecraft equipped with 5 kW electric power and the latest "Topaz-1" nuclear power plant (TEU-5, "Topol") was put into orbit in December 1987.[51] Its subsequent disaster initiated the end of the

[49] E. Galloway, *Nuclear Powered Satellites: The U.S.S.R. Cosmos 954 and the Canadian Claim,* 'Akron Law Review' 1979, Vol. 12(3), p. 414.

[50] R.V. Borodin, *Osobennosti sverkhzvukovogo obtekaniya povrezhdennoy poverkhnosti vozvrashchayemoy chasti kosmicheskogo apparata*, 'Materialy VIII Mezhdunarodnogo Foruma «Vysokiye tekhnologii KHKHI»', Moscow 2007, p. 51.

[51] D. Harland, R. Lorenz, *Space Systems Failures. Disasters and Rescues of Satellites, Rockets, and Space Probes*, Berlin/Heidelberg/New York 2005, pp. 92-93.

"Legend" missions. Ground communication with the spacecraft was suddenly interrupted on 16 April 1988, and it began descending uncontrollably in the following months. All attempts to transfer the command to withdraw the reactor or to separate the core were unsuccessful. However, the designers were determined not to introduce radioactive substances into the atmosphere, so they activated the reactor's automatic withdrawal system five days before the predicted fall on 30 September 1988. This was successfully turned on after the fuel reserves in the orientation system were exhausted.[52]

Launching of the final "Cosmos-1932" US-A on 14 March 1988 prompted international outcries of "space pollution". Although the flight lasted sixty-eight days and ended normally, it was wisely decided to abandon the use of devices with nuclear reactors.[53] Strong political pressure from the United States and international organizations demanded that the Soviet Union stop space pollution.

A further important factor in terminating "Legend" was the reactor's low technical abilities which failed to meet expectations. However, thirty-one Buk nuclear installations and one "Topaz-1" were launched in the US-A spacecraft missions. Twenty-eight of these remain in high orbits, as only one "Buk" did not reach space and two returned to Earth in emergency.

7. CONCLUSION

This article analysed the causal relationships and international legal consequences of the Soviet "Cosmos-954" satellite crash on Canadian territory. Canada is a NATO member state, and the presence of Soviet military satellite fragments on its soil became one of the most serious international incidents at the end of the Brezhnev "détente" period. However, the analysis has clearly indicated that it is possible even for oppositional states to cooperate under international law and bilateral agreements which provide compensation for the damage caused.

This outcome is possible because all parties involved in space technology are aware that unforeseen situations may be inevitable during testing processes, and that these form an indispensable condition for the development of advanced technology. The 1971 Convention on International Liability for Damage Caused by Space Objects was adopted expeditiously and, in this instance, it formed a reliable foundation for settlement of the "Cosmos 954" conflict between the oppositional States. Moreover, the 1981 bilateral agreement entitled "Settlement of the Claim

[52] O.A. Gubeladze, *Vliyaniye defektov poverkhnosti korpusa letatel'nogo apparata na teplovoy pogranichnyy sloy*, 'Yestestvennyye Nauki' 2008, No. 1, p. 29.

[53] M. Tyrrell, *Making Sense of Contaminants: A Case Study of Arviat, Nunavut*, 'Arctic' 2006, Vol. 59(4), p. 374.

between Canada and the Union of Soviet Socialist Republics for Damage Caused by "Cosmos 954" provides the precedent that negotiations and agreement between conflicting parties enable the details of the order and the content of the damage to be systematically addressed and settled. This legal process ably resolved the injured party's claims.

The legal process has thus created a reliable foundation for future settlement of complex disputes between nations. Moreover, it is important to maintain this process throughout the development of the present stage of space activity, because this will help negate escalating conflicts and disputed claims for damage during the exploration of outer space.

Most interestingly, this important example of Cosmos-954 remediation became an accepted academic example of the practical use of the Liability Convention – but is it really? The previous points made in this article identify that the claim was based on the above-mentioned convention, but what is important here is not the claim - but its settlement. In direct contrast to academic acceptance, this entire situation was actually resolved through diplomatic channels.

While everyone is congratulating the legal process for settlement of the Canada-USSR claim, this article concludes that there is not one word about "legal basis" in the document, and therefore the remediation grounds were never based on the Liability Convention. Moreover, the Claims Commission cited in Article XIV was not established.

In conclusion, the political manner in which this Cosmos-954 conundrum was settled leads the author to presume that "the provisions of the Liability Convention are dead", because it has not been used since its ratification. The remaining queries are if the space law was enacted before essential use and, most controversially, do we really need space law?

REFERENCES

Afanas'yev I., *Kistorii razrabotki sputnikov morskoy radiorazvedki*, 'Novosti Kosmonavtiki' 2007, No. 1, https://warspot.ru/17979-zvezda-polyn (accessed 18.01.2023)

Bashlakova A.A. (ed.), *Severnyy kosmodrom Rossii*. Vol. 1., Plesieck 2007

Borodin R.V., *Osobennosti sverkhzvukovogo obtekaniya povrezhdennoy poverkhnosti vozvrashchayemoy chasti kosmicheskogo apparata*, 'Materialy VIII Mezhdunarodnogo Foruma «Vysokiye tekhnologii KHKHI»', Moscow 2007

Dean R., Whitney Lackenbauer P. (eds), *Operation Morning Light: An Operational History,* Antigonish, NS 2018

Dolphin M., "*Cosmos 954" and its Unlikely Journey to the NWT 35 Years Ago*, Hay River Hub, 9 April 2013, http://www.hayriverhub.com/2013/04/kosmos-954-and-its-unlikely-journey-to-the-nwt-35-years-ago2013 (accessed 28.01.2023)

Fedik I., *Yaderno-kosmicheskaya energetika, Istoriya sovetskogo atomnogo proyekta (1940–1950),* Vol. 3, Moscow 1996

Galloway E., *Nuclear Powered Satellites: The U.S.S.R. Cosmos 954 and the Canadian Claim,* 'Akron Law Review' 1979, Vol. 12(3)

Gorove S., *Cosmos 954: Issues of Law and Policy*, 'Journal of Space Law' 1978, No. 137 Krasnov N.F., *Aerodinamika otryvnykh techeniy*, Moscow 1988

Grasty R.L., *The Search for COSMOS-954*, 'Search Theory and Applications' 1980

Grasty R.L., *The Search for COSMOS-954*, (in:) K.B. Haley, L.D. Stone, L.D. (eds), *Search Theory and Applications*, 'NATO Conference Series' 1980, Vol. 8

Gubeladze O.A., Goncharov R.A., *Zashchita vozvrashchayemoy chasti kosmicheskogo apparata, Izvestiya vuzov. Severo-Kavkazskiy region*, 'Yestestvennyye Nauki. Prilozheniye' 2006, No. 1

Gubeladze O.A., *Vliyaniye defektov poverkhnosti korpusa letatel'nogo apparata na teplovoy pogranichnyy sloy*, 'Yestestvennyye Nauki' 2008, No. 1

Harland D., Lorenz R., *Space Systems Failures. Disasters and Rescues of Satellites, Rockets, and Space Probes*, Berlin/Heidelberg/New York 2005

Kaptsov O., *Morskaya kosmicheskaya sistema razvedki i tseleukazaniya*, Voyennoye obozreniye, 20.03.2012, https://topwar.ru/12554-morskaya-kosmicheskaya-razvedka-celey.html (accessed 18.01.2023)

Kulandin A.A., Timashev S.V., Zaytsev I.V., *Energeticheskiye sistemy kosmicheskikh apparatov*, Moscow 1994

Makarov O., *Krylatyye rakety i kosmicheskaya razvedka: ubiytsy avianostsev, Techinsider*, Voyennaya aviatsiya, 28.04.2020, https://www.techinsider.ru/weapon/182371--razvedchik-na-bystrykh-neytronakh/ (accessed 18.01.2023)

Morrison C.A., *Voyage into the Unknown: The Search for and Recovery of Cosmos 954*, 'Archivaria' 1982, No. 17

Note J.A.B., *Convention on International Liability for Damage Caused by Space Objects: Definition and Determination of Damages After the Cosmos 954 Incident*, 'Fordham International Law Journal' 1984, No. 8

Orlova G.A., *Fiziki-yadershchiki v bor'be za pravo na kosmos,* 'Apokrif, Tekhnologos' 2018, No. 2

Power E.J.J., Keeling, A., *Cleaning up Cosmos: Satellite Debris, Radioactive Risk, and the Politics of Knowledge in Operation Morning Light*, 'The Northern Review' 2018, No. 48

Power E.J.J., *Memories of Mistrust and Contamination: The Legacies of Cosmos 954 and Operation Morning Light in Denendeh*, Master Thesis, Department of Geography and Planning, University of Toronto, 2019, https://tspace.library.utoronto.ca/bitstream/1807/98549/1/Power_Ellen_201911_MA_thesis.pdf (accessed 28.01.2023)

Pupko V., *Istoriya rabot v FEI po razrabotke i sozdaniyu YARD i kosmicheskikh YAEU, 50 let FEI*, Obninsk 1996

Schwartz B., Berlin M.L., *After the Fall: An Analysis of Canadian Legal Claims for Damage Caused by Cosmos-954*, 'McGill Law Journal' 1981, No. 27

Tarasenko M., *Voyennyye aspekty sovetskoy kosmonavtiki*, Moscow 1992

Taylor H.W., Hutchison E.A., McInnes K.L., Svoboda J., *Cosmos 954: Search for Airborne Radioactivity on Lichens in the Crash Area, Northwest Territories, Canada*, 'Science' 1979, Vol. 205(4413)

Tyrrell, M. *Making Sense of Contaminants: A Case Study of Arviat, Nunavut*, 'Arctic' 2006, Vol. 59(4)

Verba V.S. (ed.), *Radiolokatsionnyye Sistemy Zemleobzora Kosmicheskogo Bazirovaniya*, Moscow 2010

Yakovlev O.V., *Sistemnyy analiz bezopasnosti i riska kosmicheskoy yadernoy energetiki*, 'Vestnik VGU. Seriya: Sistemnyy Analiz i Informatsionnyye Tekhnologii' 2011, No. 2

Yartsev V.S., *Krusheniye sovetskogo sputnika «Kosmos-954» i mezhdunarodnyye posledstviya*, Moscow 2018

Yuzbashyan M., *Aktual'nyye mezhdunarodno-pravovyye voprosy razresheniya sporov v oblasti kosmicheskoy deyatel'nosti*, 'Pravo i Upravleniye. XXI Vek' 2018, No. 2(47)

Zemlyanov A., Kossov G., Traube V., *Sistema morskoy kosmicheskoy razvedki i tseleukazaniya (istoriya sozdaniya),* Sankt Petersburg 2002

Zheleznyakov A., *Avariya sputnika "Kosmos-954"*, 'Sekretnyye Materialy' 2004, No. 19

Zheleznyakov A., *Yadernoye sozvezdiye: istoriya sozdaniya i ekspluatatsii otechestvennykh kosmicheskikh apparatov s yadernymi energeticheskimi ustanovkami*, 'Atomnaya Strategiya XXI' 2004, No. 9

Zheleznyakov A.B., *Tayny raketnykh katastrof: plata za proryv v kosmos*, Moscow 2004

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THE CONVENTION ON INTERNATIONAL LIABILITY FOR DAMAGE CAUSED BY SPACE OBJECTS FROM THE HUMAN RIGHTS PERSPECTIVE – SELECTED ASPECTS

Abstract

In spite of the Convention on International Liability for Damage Caused by Space Objects being in force for a long time, it has not as yet been analysed from a human rights perspective. While at the beginning of the space age activities in space were associated only with states, the progress on humankind in the conquest of space has significantly changed that. Nowadays, the role of individuals in space operations is growing. The well-established human rights law on Earth also needs to be reflected in regulations concerning outer space. This paper assesses selected aspects of the Convention from the human rights perspective. The analysis encompasses the definition of "damage" along with the possible amount of compensation due to individuals and the different aspects of procedural guarantees available for them. The paper presents two possible routes for obtaining compensation: one through diplomatic channels and another using national channels of launching states. This study offers a *de lege ferenda* proposal to appeal to state parties to introduce internal regulations aimed at avoiding human rights infringements. Domestic law systems may create legal provisions that may fill the

gaps caused by the Convention's limitations, e.g. by introducing an appropriate insurance system for space passengers.

KEYWORDS

Convention on International Liability for Damage Caused by Space Objects, international human rights law, space and human rights

SŁOWA KLUCZOWE

Konwencja o międzynarodowej odpowiedzialności za szkody wyrządzone przez obiekty kosmiczne, międzynarodowe prawo ochrony praw człowieka, kosmos a praw człowieka

1. INTRODUCTION

Despite the Convention on International Liability for Damage Caused by Space Objects (Convention) being in force for a long time, it has not as yet been analysed from a human rights perspective. One probable explanation is that it is not a common practice to merge these two very different fields of international law. Nevertheless, it is perfectly permissible to do so and there are no obstacles from legal and ethical perspectives. The first to point out the intersection of these two fields was Christol.[1] Expanding upon his concept, Freeland and Jakhu highlighted the relationship between space law and human rights law remarking that "(i)t is undisputed that, from a 'legal rules' perspective the international regulation of outer space – past, present and future – is 'embedded' in international law. It is not an esoteric and separate paradigm limited solely to the *lex specialis* of space law with which we are familiar. (…) Notwithstanding the continuing applicability of the fundamental framework of space principles, in such cases, were the need to arise, it will often become necessary to draw upon other areas of international law to resolve a particular dispute".[2] Following Christol's, Jakhu's and Freeland's thinking, several aspects of the Convention might be considered from a human rights perspective.

[1] C. Christol, *Human Rights in Outer Space,* American Institute of Aeronautics and Astronautics (AIAA). Paper No. 68-910-1967; https://doi.org/10.2514/6.1968-910, p. 1.

[2] S. Freeland, R. Jakhu, *The Intersection Between Space Law and International Human Rights Law,* (in:) R. Jakhu, P. Depsey (eds), *Routledge Handbook of Space Law*, New York 2017, p. 228.

In fact, the Convention on International Liability for Damage Caused by Space Objects addresses the topic of life and well-being of individuals much more than it was originally realised. It is worth taking a closer look at the definition of "damage", the possible amount of compensation due to individuals, and the different aspects of procedural guarantees available to them, considering the human rights law perspective.

An analysis of this critical legal instrument involved different methods. In the first part of the article, the historical perspective is presented, before applying the classical method for legal analysis, that is an investigation of the law in force. This first part provides a context for the other aspects of the analysis which follow.

2. HISTORICAL PERSPECTIVE

The historical approach to the existing legal acts is based on an analysis of other events that happened at the time of adoption of the Convention. The Legal subcommittee of COPOUS negotiated the Convention between 1963 and 1972. The agreement on the content of the text was reached in the UN General Assembly in 1971.[3] The resolution adopted by the GA in its very first sentence stated: "Reaffirming the importance of international cooperation (…) and of promoting the law in this new field of human endeavor". This part of the resolution acknowledged that it is in the nature of human beings to acquire new knowledge and experience, as set out in Article 27 of the Universal Declaration of Human Rights, which states that "everyone has the right freely to share in scientific advancement and its benefits".[4]

The Convention was signed at the beginning of March 1972, ahead of an important human rights event in Stockholm: the United Nations Conference on the Human Environment which took place on 5-16 June 1972.[5] The responsibility for environmental protection, which rests with humans, has been introduced in the first principle of the Declaration of the United Nations Conference on the Human Environment: "(M)an has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations."[6]

[3] UNGA Resolution 2777. Convention on International Liability for Damage Caused by Space Objects. RES 2777 (XXVI).

[4] UNGA, Universal Declaration of Human Rights, 10 December 1948, 217 A (III).

[5] United Nations Conference on the Human Environment, 5-16 June 1972, Stockholm, https://www.un.org/en/conferences/environment/stockholm1972 (accessed 21.02.2023).

[6] Declaration of the United Nations Conference on the Human Environment, http://www.un-documents.net/unchedec.htm (accessed 21.02.2023).

This same principle of care for environmental protection spelled out during the Stockholm conference, was among the driving forces for the Convention's creation several months earlier. The above-mentioned principle may be seen as an original cause and a first framework to implement responsibility for damage caused by space objects by introducing the concept of absolute liability to pay compensation for damage caused by space objects on the surface of the Earth or to aircraft for a launching State and liability based on fault for damage caused in space. It could be interpreted almost as a coming-of-age moment for the international community. However, it is worth underlining that the way the environment is understood within the Convention excludes the space environment as such[7] and leaves significant doubts about covering environmental damage on the Earth, which is not closely related to the term "harm" used in Article 1.[8] This exclusion, especially nowadays, raises many difficulties, since protecting the space environment has become critical.[9]

In the context of the analysis conducted above, demonstrating the profound relationship between the need for a system of responsibility for space damage and the protection of human rights, one can safely say that 1972 was a special year. An apt metaphor for it is the very popular, even symbolic, first colour photograph of the Earth taken from space in December 1972 by the Apollo 17 crew (called Blue Marble).[10]

3. REMEDY ISSUES

Effective remedy, one of the main concepts of international law, is retained in space law, initially by including grounds for responsibility in Article VII of the Outer Space Treaty[11], followed by the adoption of the Convention on International Liability for Damage Caused by Space Objects. Drawing up of the Convention also goes in line with one of the main principles of human rights, which states that any infringement of human rights needs to be adequately redressed.[12]

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[7] A. Kerrest, L.J. Smith, *Article I of the Convention on International Liability for Damage Caused by Space Objects,* (in:) S. Hobe, B. Schimdt-Tedd, K.-U. Schrogl (eds), *Cologne Commentary on Space Law.* Vol. II, Köln 2013, p. 113.

[8] M. Polkowska, *Prawo kosmiczne w obliczu nowych problemów współczesności*, Warsaw 2011, p. 74.

[9] More in: Y. Zhao, *The 1972 Liability Convention: Time for Revision?,* 'Space Policy' 2004, No. 20, pp. 118-122.

[10] NASA, *Blue Marble - Image of the Earth from Apollo 17*, 30 November 2007, https://www.nasa.gov/content/blue-marble-image-of-the-earth-from-apollo-17 (accessed 21.02.2023).

[11] UNGA, Res. 2222 (XXI), https://www.unoosa.org/pdf/gares/ARES_21_2222E.pdf (accessed 21.02.2023).

[12] D. Harris, M. O'Boyle, E. Bates, C. Buckley, *Law of the European Convention on Human Rights* (2nd edition), New York 2009, p. 562.

The Convention's creators employed the compensation method to satisfy the need for remedies. It must be noted that the Convention goes a step further by introducing the concept of damage that can occur as a result of legal activity. This principle is set out in Article II of the Convention, which specifies that states bear absolute liability to pay compensation for damage caused by space objects on the Earth's surface or to aircraft in flight that occurs through legitimate activity and irrespective of fault. However, an exception to this absolute liability exists, as provided for in Article VI of the Convention.[13] The exception relies on the contribution to the damage caused by the claimant state and does not apply in the event that the space activities are conducted in breach of international law.[14] Article III of the Convention addresses the situation of damage in space employing the principle of liability based on fault.

Whether the damage occurs due to legal or illegal activity in space, the consequence could be very harmful to individuals. The Cosmo 954 accident serves as an example of how serious such damage might be.[15] Such an accident could lead to severe injury to the body or health of an individual, and even death, which is undoubtedly one of the circumstances that requires a remedy.

In human rights law, notions of effective remedy were accurately defined in the UN General Assembly resolution 60/147 – Basic Principles and Guidelines on the Right to a Remedy and Reparation for Victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law.[16] The resolution is a non-binding instrument, yet it systematises matters which have already been regulated in various human rights treaties, such as Articles 2(2) and (3) of the International Covenant on Civil and Political Rights (ICCPR)[17], Article 13 of the Convention for the Protection of Human Rights and

[13] Article VI(1): "Subject to the provisions of paragraph 2 of this Article, exoneration from absolute liability shall be granted to the extent that a launching State establishes that the damage has resulted either wholly or partially from gross negligence or from an act or omission done with intent to cause damage on the part of a claimant State or of natural or juridical persons it represents".

[14] Article VI(2): "No exoneration whatever shall be granted in cases where the damage has resulted from activities conducted by a launching State which are not in conformity with international law including, in particular, the Charter of the United Nations and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies."

[15] A. Cohen, *Cosmos 954 and the International Law of Satellite Accidents,* 'Yale Journal of International Law' 1984, Vol. 10, https://openyls.law.yale.edu/handle/20.500.13051/6129 (accessed 21.02.2023).

[16] UNGA, Basic Principles and Guidelines on the Right to a Remedy and Reparation for Victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law, A/RES/60/147.

[17] "2. Where not already provided for by existing legislative or other measures, each State Party to the present Covenant undertakes to take the necessary steps, in accordance with its constitutional processes and with the provisions of the present Covenant, to adopt such laws or other measures as may be required to give effect to the rights recognized in the present Covenant.

Fundamental Freedoms (ECHR)[18] and Article 47(1) of the Charter of Fundamental Rights of the European Union.[19] The aforementioned resolution clarifies the role of effective remedies. In the context of space such recalling of the institution of effective remedy has two aspects.

One is based purely on human rights principles. It might be described as fulfilment of the effective remedy concept. It may be done internally, as the strict human rights doctrine interprets the provisions of ICCPR and other legal acts, or by bringing this human rights spirit into space, which is done inter alia by introducing procedures for awarding compensation. Such procedures fulfil the definition formulated by Hofmański and Wróbel, who claim that an "effective remedy" should be understood broadly as any legal remedy that makes it possible to deal with a case.[20]

The second is based on granting full effect to human rights law in the form of direct application of legal norms described in human rights treaties. Such an approach can be based on damage to life and/or health of an individual on Earth caused by space objects and obligations introduced by Article 2(2) and (3) ICCPR (as well as Article 13 ECHR for Council of Europe members) to introduce internal procedures to safeguard the duty to compensate the damage. However, the Convention on International Liability for Damage Caused by Space Objects allows for an exception to the regular internal process as the core of the compensation procedures is framed by the Convention.

As described in detail below, the Convention allows individuals to access two possible routes for obtaining compensation: one through diplomatic channels and another using national channels of launching States. Both are analysed below.

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3. Each State Party to the present Covenant undertakes:

(a) To ensure that any person whose rights or freedoms as herein recognized are violated shall have an effective remedy, notwithstanding that the violation has been committed by persons acting in an official capacity;

(b) To ensure that any person claiming such a remedy shall have his right thereto determined by competent judicial, administrative or legislative authorities, or by any other competent authority provided for by the legal system of the State, and to develop the possibilities of judicial remedy;

(c) To ensure that the competent authorities shall enforce such remedies when granted."

[18] "Everyone whose rights and freedoms as set forth in this Convention are violated shall have an effective remedy before a national authority notwithstanding that the violation has been committed by persons acting in an official capacity."

[19] "Everyone whose rights and freedoms guaranteed by the law of the Union are violated has the right to an effective remedy before a tribunal in compliance with the conditions laid down in this Article."

[20] P. Hofmański*, Art. 13,* (in:) L. Garlicki (ed.), *Konwencja o ochronie praw człowieka i podstawowych wolności.* Vol. 1, Warsaw 2010, p. 728.

4. DEFINITION OF THE TERM "DAMAGE"

The Convention on International Liability for Damage Caused by Space Objects, when analysed from a human rights perspective, requires an elaboration on the concept which could well be seen as the heart of this treaty, i.e. the definition of the term "damage". The treaty states that "(a) (t)he term 'damage' means loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical, or property of international intergovernmental organizations".[21] The definition of "damage" mirrors the approach adopted in the preamble which places a human being in the centre of the protection regime. It serves as a reflection of the fourth paragraph of the Convention's preamble which states: "Recognizing the need to elaborate effective international rules and procedures concerning liability for damage caused by space objects and to ensure, in particular, the prompt payment under the terms of this Convention of a full and equitable measure of compensation to victims of such damage".

This perspective is also shared by Smith and Kerrest, who write: "The Convention was drafted with a view to achieving a victim-oriented and unlimited system of liability".[22] The definition aims to protect two fundamental values from a human rights perspective, i.e. life and property. It applies not only in cases of death and physical injury but also other health impairments. These different forms of health impairments, such as trauma or shock, naturally need to be demonstrated taking into accordance the legal principles of causality. Causality has to be demonstrated as well when the damage concerns the environment and impacts human life.[23] However, the definition's wording makes its application to environmental damage controversial in certain situations, such as those that concern territories not under state sovereignty, e.g. high seas.[24]

Any loss of or damage to property of persons is also included in the definition. Consequently, all material damage related to State property and individual property is covered.

As Tronchetti, Smith and Kerrest note on the proposal of the Moroccan delegation of June 1971, Article XXI introduces a particular type of "damage that creates a large-scale danger to human life or seriously interferes with the living conditions of the population or the functioning of a vital center".[25] The occurrence

[21] Article 1 of the Convention on International Liability for Damage Caused by Space Objects.

[22] A. Kerrest, L.J. Smith, *Article VI ...*, 2013, *op. cit*., p. 146.

[23] A. Kerrest, L.J. Smith, *Article I...*, 2013, *op. cit*., p. 113.

[24] *Ibid.* and more on environmental damage in L. Viikari, *Environmental Aspects of Space Activities,* (in:) F. von der Dunk, F. Tronchetti (eds), *Handbook of Space Law*, Cheltenham 2015.

[25] F. Tronchetti, L.J. Smith, A. Kerrest, *Article XXI of the Convention on International Liability for Damage Caused by Space Objects,* (in:) S. Hobe, B. Schimdt-Tedd, K.-U. Schrogl (eds), *Cologne Commentary on Space Law.* Vol. II, Köln 2013, p. 200.

of such damage triggers the obligation on the State Parties of the Convention, and especially of the launching states, to examine the possibility of rending assistance. It can be delivered only at the request of states on whose territory such damage occurred. Including this provision in the Convention may be seen as a prioritisation of human life among other values. The introduction of this provision, as Tronchetti, Smith and Kerrest once again note, without any further discussion[26], is a manifestation of an engagement in "a life of dignity and well-being" as stated during the aforementioned United Nations Conference on the Human Environment. Such a premise fits the spirit of human rights; however, a broad scope of the concept of "large-scale danger" can potentially lead to interpretation disputes in this area. Article XXI clarifies that rending such assistance will not influence the right of State Parties to implement other provisions of the Convention, including the right to submit a claim.

What needs to be stressed, from a human rights perspective the definition of the term "damage" does not introduce any limits to the amount of damages or compensation which may be sought under the liability regime. Moreover, Article XII of the Convention establishes the principle of *restitution in integrum* according to which the compensation must be determined in such a way that it "will restore the person (…) on whose behalf the claim is presented to the condition which would have existed if the damage had not occurred". The lack of limits, along with the principle of *restitution in integrum,* also applicable in human rights law, may be seen as one of the greatest advantages of this regulation.[27] In light of this clear advantage, proposals, such as those put forward by Zhao, to introduce limits similar to those set up in the Warsaw Convention for the Unification of Certain Rules Relating to International Carriage, have to be treated very carefully.[28] At this stage the scope of possible types of damages is still somewhat unclear, so such unification could prove to be detrimental to the protection of rights of individuals.

In summary, the definition cited above is designed in a way that can support the implementation of norms of the human rights law dedicated to protecting the right to life and the right to property. Additionally, the introduction of Article 1 of the Convention, which includes the definition of the terms used, is conducive to building legal certainty. Including definitions in treaties is a good practice in general from a human rights perspective. However, it is still not universally used in human rights legal instruments. Nevertheless, a positive trend in this area can

[26] *Ibid.*

[27] A. Buyse, *Lost and Regained? Restitution as a Remedy for Human Rights Violations in the Context of International Law,* 2008, p. 21, https://web.archive.org/web/20200709023251/https://dspace.library.uu.nl/bitstream/handle/1874/32809/Restitution.pdf?sequence=1 (accessed 21.02.2023).

[28] Y. Zhao, *The 1972 Liability Convention: Time for Revision?*, 'Space Policy' 2004, No. 20, p. 120.

be observed as two UN treaties have recently incorporated provisions that present a list of definitions: the Convention on the Rights of Persons with Disabilities and the International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families.[29]

5. COMPENSATION PROCEDURES

The Convention on International Liability for Damage Caused by Space Objects attempts to fulfil the concept expressed in the right to an effective remedy by introducing an important procedural safeguard that allows infringements committed to be adequately rectified.

Compensation can be claimed from the launching state as set out in Articles II and III of the Convention.[30] The interests of the injured parties are secured by Article V, which establishes joint and several liabilities of launching states if more than one falls within the definition introduced in Article 1. Article V provides the possibility to seek compensation from any of the launching states, which is a highly favourable solution form a human rights perspective.

The redress, as stipulated in Articles IX and XI of the Convention, could be obtained using two possible ways. One is through diplomatic channels described in Article IX of the Convention and the other is by using national channels of launching states.

The first procedure, regulated in Article IX of the Convention, veers to the path of diplomatic protection, which is rare in human rights law. Nowadays, human rights protection standards lie in the ability to claim rights by using one's national jurisdiction and, in case of not obtaining appropriate remedy, to file a complaint with the international tribunals that deal with human rights infringements. However, the Convention in one of its procedural channels refers to a classic institution of international law that features large *acquis* concerning diplomatic protection.

The diplomatic protection procedure introduced jointly in Articles IX and VIII may be seen as favourable from the perspective of individuals. Article VIII of the Convention provides for a number of potential States which are eligible to file a claim using this channel. The claiming State must be in one of the three defined relationships with the victim: it must be the State where the damage occurs, or it is the State of nationality of the victim or the State of permanent residence of the victim. As Smith and Kerrest confirm, the Convention introduces an order which gives preference to the State of nationality over the State where the

[29] Article 2 of both conventions.

[30] A. Kerrest, C. Thro, *Liability for Damage Caused by Space Activities*, (in:) R. Jakhu, P. Depsey (eds), *Routledge Handbook of Space Law*, New York 2017, p. 60.

damages occurred. Finally, if both aforementioned States fail to bring a claim, the State of residence may do so.[31]

It needs to be pointed out that the design of the Convention allows presenting a compensation claim irrespective of whether the claimant State is a party to the Convention.[32] Not limiting the States allowed to submit a claim to the parties of the Convention deserves credit from a human rights perspective. Such a solution goes a long way in implementing the principle of non-discrimination, as it is understood in human rights law, e.g. in Article 2(1) ICCPR or Article 14 ECHR.

If the State that submits the claim lacks diplomatic relations with launching States, it may request assistance. Other States could offer to act as intermediaries and the Secretary-General of the UN may also be involved in such a capacity, providing both the claimant State and lunching State are UN members.[33]

The procedure established by the Convention has one crucial shortcoming related to the very core of the notion of diplomatic protection. The process of the victim's fall-back on diplomatic protection domestically is left entirely out of the Convention's purview. It is understandable from an international law perspective because it is in the state's exclusive competence. However, it may be considered a disadvantage from a human rights perspective. Therefore, great clarity in the domestic procedures is needed to safeguard legal certainty, which is a significant value in human rights law.[34]

The claim for compensation set out by the Convention needs to be submitted by the deadline established in its Article X. This article limits this time to "one year". The lapse of this deadline may begin at different points in time, as listed in said article: the date of the occurrence of damage or the date of the identification of the launching State to name a few. When applying the human rights perspective, this multipoint construction can be seen as a solution introduced to secure the interests of victims of damage.

Schmalenbach claims that it is a surprisingly short period.[35] However, shortening the entire procedure as much as possible could also be interpreted as a victim-oriented approach and, in such light, appreciated. Keeping the proceedings

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[31] A. Kerrest, L.J. Smith, *Article VIII of the Convention on International Liability for Damage Caused by Space Objects,* (in:) S. Hobe, B. Schimdt-Tedd, K.-U. Schrogl (eds), *Cologne Commentary on Space Law.* Vol. II, Köln 2013, pp. 156-157.

[32] K. Schmalenbach, *Convention on International Liability for Damage Caused by Space Objects,* (in:) P. Gailhofer et al. (eds), *Corporate Liability for Transboundary Environmental Harm*, Springer, Cham 2023, https://doi.org/10.1007/978-3-031-13264-3_11, p. 576.

[33] More about the parties to convention: K. Doo Hwan, *Global Issues Surrounding Outer Space Law and Policy*, Hershey 2021, p. 25.

[34] The diplomatic protection as a way to protect human rights has been contested in legal scholarship, and the assessment of this issue is beyond the scope of this article. More in: P. Kobielski, *Diplomatic Protection in Practice of European Court of Human Rights*, 'Problemy Współczesnego Prawa Międzynarodowego, Europejskiego i Porównawczego' 2015, Vol. XIII, pp. 42-43.

[35] K. Schmalenbach, 2023, *op. cit*., p. 532.

shorter encourages submission of a claim even if the amount of damage is not yet clear. From the point of view of the injured party, such construction may act in favour of the individual in terms of obtaining compensation faster and prevents undue delays in completing the procedure which may arise from an attempt to meticulously ascertain the exact extent of damage.

Moreover, when applying the aforementioned perspective, it is worth comparing the indicated period with ones provided for in human rights treaties and checking it against the concept of "reasonable time" as interpreted in the case-law of the European Court of Human Rights.

The "one-year" rule exists in many procedures for protection of human rights, with such a deadline appearing in Article 3(2)(a) of the Optional Protocol of the International Covenant on Economic, Social and Cultural Rights[36] and in Article 7(h) of the Optional Protocol to the Convention on the Rights of the Child.[37] In both cases, it is counted from the moment domestic remedies are exhausted, which differs from the analysed instruments. Some human rights bodies and courts like the ECtHR, due to their workload, limit this time to an even shorter period. For example, in February 2022, the ECtHR introduced a 4-month deadline to submit a claim.[38]

In addition, the "reasonable time" standard is introduced in Article 6 of the European Convention on Human Rights titled Right to fair trial. This standard is formally applied to the legal proceedings under Article 6 ECHR; however, by extension, it may be applied to the "one-year" rule that exists in the Convention. The European Court of Human Rights states that it is every person's right to obtain a final decision on disputes concerning civil rights and obligations within a reasonable time.[39] As Harris, O'Boyle, Bates and Buckley rightly point out by recalling the H v. France case, the purpose of "reasonable time" underlines the importance of rending justice without delays which might jeopardize its effectiveness and credibility".[40] The criteria established by the ECtHR specify that "reasonable time" must be assessed in the light of the circumstances of the case and in accordance with the following indicators: the complexity of the case, the conduct of the applicant and of the relevant authorities and what was at stake for the appli-

[36] "The Committee shall declare a communication inadmissible when: (a) It is not submitted within one year after the exhaustion of domestic remedies, except in cases where the author can demonstrate that it had not been possible to submit the communication within that time limit".

[37] "The Committee shall declare a communication inadmissible when: (a) It is not submitted within one year after the exhaustion of domestic remedies, except in cases where the author can demonstrate that it had not been possible to submit the communication within that time limit".

[38] Article 35(1) ECHR as amended by Protocol 15.

[39] ECtHR judgments: Comingersoll S.A. v. Portugal (Application no. 35382/97), para. 24; Lupeni Greek-Catholic Parish of Lupeni and Others v. Romania (Application no. 76943/11), para. 142.

[40] D. Harris, M O'Boyle, E. Bates, C. Buckley, 2009, ***op. cit.***, p. 278.

cant in the dispute.[41] In light of this test, the "one-year" rule for submitting the claim concerning the space damage seems rational. The aforementioned criteria could serve as a good model for assessing all proceedings under the Convention. However, the assessment can only be done on a case-by-case basis, as too many variables can appear.

The provisions of Article XI of the Convention also expressly exclude exhaustion of domestic remedies as a prerequisite to the submission of the claim based on diplomatic protection. This model is rarely applied in human rights laws, as such a requirement does not usually exist, before nearly any human rights bodies and courts. The lack of an obligation to use domestic remedies makes the system more akin to the one protecting social rights, since the European Committee of Social Rights does not require the exhaustion of domestic remedies either.

The Convention also sets out a solution for an event in which using the diplomatic channel does not bring about a settlement of the claim. Articles XIV to XX of the Convention regulate the establishment and functioning of the Claims Commission, which aims to solve disagreements concerning the claim. The existence of such a possibility commands praise from a human rights perspective, yet, due to limits of this publication, is left out of the in-depth analysis.

Article XI of the Convention also introduces the second route for obtaining compensation based on national law. Section XI(2) excludes the ability to present a claim using the diplomatic protection procedure if one has already been submitted directly by the victim using local remedy instruments, which complies with the *ne bis in idem* rule. The analysed article specifically indicates that the claim should be submitted to "courts or administrative tribunals or agencies of a launching State." Smith and Kerrest[42] and Thro[43] suggest that it can be filed in the jurisdiction chosen by the victim.[44] From a human rights perspective, such a solution would be comfortable as it would keep the victim, as a weaker party in the case, in the most familiar legal environment.[45] Even if the Convention's word-

[41] ECtHR judgement, Bieliński v. Poland (Application no. 48762/19), paras. 42-44.

[42] A. Kerrest, L.J. Smith, *Article XI of the Convention on International Liability for Damage Caused by Space Objects* (in:) S. Hobe, B. Schimdt-Tedd, K.-U. Schrogl (eds), *Cologne Commentary on Space Law.* Vol. II, Köln 2013, p. 168.

[43] A. Kerrest, C. Thro, 2017, *op. cit.*, p. 68.

[44] A. Kerrest, L.J. Smith, *Article XI...,* 2013, *op. cit.*, p. 168.

[45] Such a positive trend in international law is confirmed in air law by introducing Article 33(2) of the Convention for the Unification of Certain Rules for International Carriage by Air (the Montreal Convention), OJ L 194, 18.7.2001, p. 39–49: "In respect of damage resulting from the death or injury of a passenger, an action may be brought before one of the courts mentioned in paragraph 1 of this Article, or in the territory of a State Party in which at the time of the accident the passenger has his or her principal and permanent residence and to or from which the carrier operates services for the carriage of passengers by air, either on its own aircraft, or on another carrier's aircraft pursuant to a commercial agreement, and in which that carrier conducts its business of carriage of passengers by air from premises leased or owned by the carrier itself or by another carrier with which it has a commercial agreement."

ing may not expressly support such interpretation, this analysis, which includes the drafting history of the Convention, confirms that such a functional interpretation of this provision is in fact permissible.[46]

Smith and Doldrina share this view.[47] However, they derive such a conclusion from other sources, which has its own reservations. They base their position on Regulation (EC) No. 864/2007 of the European Parliament and of the Council (Rome II), which would mostly, but not exclusively, apply to EU Member States.[48] These authors explain that Article 4 of Rome II points to the law of the country in which the damage occurs, which for most cases would mean the national jurisdiction of the victim. Following the Rome II provision, this more favourable jurisdiction could be relevant only if the damage arises from a tort/delict, as this regulation's main scope of application. The possibility of applying the instrument of Rome II in the circumstances of space damage is also confirmed by the fact that it was not excluded by Article 29 of Rome II.[49] However, it is worth noting that Rome II provisions are not applicable where the damage occurs due to a legal act of launching by a State for which the Convention was chiefly established.

In summary, the possibility to choose between two channels of obtaining compensation is one of the advantages that the Convention offers. However, it must be stressed once again that opening the proceedings in domestic law automatically closes the possibility to submit a claim based on diplomatic protection, as the latter is accessible only if there is no prior submission concerning local remedies.

6. LIMITATIONS

Another common ground between the Convention on International Liability for Damage Caused by Space Objects and human rights law lies in the concept of limitation. The notion of limitation functions and is described in international law of human rights in some detail. The fundamental rule of human rights law is inscribed in a phrase expressed by Alexis de Tocqueville: "(T)he freedom of man ends where the freedom of another begins." In short, each human right features adequate limitation described in the relevant human rights treaties.

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[46] A. Kerrest, L.J Smith, *Article XI...,* 2013, *op. cit.*, p. 168.

[47] L.J. Smith, C. Doldrina, *Jurisdiction and Applicable Law in Cases of Damage from Space in Europe–The Advent of the Most Suitable Choice–Rome II*, 'Acta Astronautica' 2010, Vol. 66, https://doi.org/10.1016/j.actaastro.2009.05.008, p. 242.

[48] *Ibid*.

[49] Notifications under Article 29(1) of Regulation (EC) No 864/2007 on the law applicable to non-contractual obligations (Rome II), OJ C 343, 17.12.2010, p. 7.

The Convention's framework includes the abovementioned concept. Article VII of the Convention sets out limitations too. It limits the application of the Convention by leaving out damage caused to the citizens of launching States and citizens of other countries that take part in the space operations.[50] Such limitations are significant for the present research because they directly affect individuals and, as such, they have to be assessed from a human rights law perspective.

The strict limitations exclude the Convention's applicability regarding citizens of the launching State and citizens of other countries engaged in the space activities. This leaves a fundamental question of whether there is a basis for those citizens to obtain compensation.

Two of the most tragic space accidents, the Challenger and Columbia disasters, may serve as a suitable illustration of the problem. Both are excluded from the Convention's scope based on its Article VII. Limited access to the settlement's material and proceedings from the Challenger and Columbia disasters does not allow for in-depth research. In both cases, the settlements were made out of court and, due to the protection of the families' privacy, were disclosed long after the conclusion. Moreover, the disclosure procedure failed to mention the exact compensation amount for families of each victim.[51] However, what is essential from a human rights perspective is that only one settlement, in both disasters, was done without the financial involvement of the US government.[52] Such circumstances may confirm the existence of a government sense of responsibility regarding such disasters, even if there is no clear legal basis in the Convention for bearing such responsibility.

As such, the answer to the above question of where citizens who are excluded from the scope of the Convention should look to obtain compensation is to be found in domestic laws and regulations.

The practical solution to this problem adopted by some states is the introduction of internal space law that covers individuals excluded from the scope of the Convention. Such solutions which may be modelled on Article 6[53] of the French Law No. 2008-518 of 3 June 2008 on space operations.[54] The provision imposes an obligation on the State and public establishments to obtain insurance which

[50] M. Couston, *Droit spatial*, Paris 2014, p. 79.

[51] M. Darsey, *To the Stars, Despite Adversity: Liability for the Columbia Space Shuttle Tragedy*, 'Houston Law Review' 2005, Vol. 5, p. 469.

[52] *Ibid.*

[53] "III – The insurance or financial guarantee must benefit, to the extent of the responsibility that may fall to them because of damage caused by a space object, the following persons:

1° The State and its public establishments;

2° The European Space Agency and its Member States;

3° The operator and the persons who participated in the production of the space object or in the space operation."

[54] Law No. 2008-518 of 3 June 2008 relating to space operations, JORF (Official Journal "Laws and Decrees") No. 0129 of 4 June 2008 (France).

covers compensation in case of accountability of such actors. Moreover, as Kerrest and Thro note that such a norm equalises the protection of national victims with foreigners[55], which is welcome from a human rights perspective.

Smith and Kerrest propose another solution in their publication.[56] These authors point to the European Space Agency's agreements with the Member States which provide insurance on the life and health of astronauts during missions.[57] The proposed solution seems particularly important in the case of the participation of international organisations and, from the perspective of individuals, appears to be rather convenient.

Looking at the Polish internal regulations, it is worth stressing that we are lacking adequate provisions so far. As such, injured parties have to seek remedy through the general norms of civil law. However, in practice it might not be easy to follow the concept presented by Kobielski, who suggests that such claims be based on Article 417 of the Polish Civil Code. The limitation of using this legal basis is similar to that concerning using the Rome II regulation, which means that it can be applied only in the event of an illegal act or omission. In consequence, the question of obtaining compensation in the case of legal activity remains open.[58]

As described above, limitation is a concept that, on the one hand, is well-known in the human rights law and may be worked around. On the other hand, its application in the Convention may lead to exclusions that in turn may lead to human rights infringements. For example, Article VII of the Convention significantly impacts space tourism activity. Most of the representatives of legal scholarship are inclined to believe that passengers of a spacecraft cannot claim compensation on the basis of the Convention on International Liability for Damage Caused by Space Objects.[59] Such limitation, if no alternative is provided at the domestic level, may lead to human rights infringements.

7. CONCLUSIONS AND RECOMMENDATIONS

In conclusion, it is essential to introduce, at all possible levels, the ability for individuals to obtain adequate protection in case of any human rights infringements caused by a space object. Only such an approach would fulfil the principle spelled out in Article 28 of the Universal Declaration of Human Rights, i.e.:

[55] A. Kerrest, C. Thro, 2017, *op. cit*., p. 68.

[56] A. Kerrest, L.J Smith, *Article VIII...,* 2013, *op. cit*., p. 152.

[57] A. Kerrest, L.J Smith, *Article VIII...,* 2013, *op. cit*., p. 152.

[58] P. Kobielski, *Budowa tarczy antyrakietowej w Polsce a demilitaryzacja przestrzeni kosmicznej,* (in:) Z. Galicki, T. Kamiński, K. Myszona-Kostrzewa (eds), *Wykorzystanie przestrzeni kosmicznej – Świat-Europa- Polska,* Warsaw 2010, p. 212.

[59] S. Hobe, *Legal Aspects of Space Tourism*, 'Nebraska Law Review' 2007, Vol. 86(2), https://digitalcommons.unl.edu/nlr/vol86/iss2/6, p. 450.

"(e) eryone is entitled to a social and international order in which the rights and freedoms outlined in this Declaration can be fully realized." The above-conducted analysis confirms the observations made by Potter, who writes that: "the development of outer space together with rapidly changing human rights issues will create enormous challenges to those who participate in the area of space law".[60] This interpretative line was continued by Polkowska, who expressed her position on "the Convention's lack of effectiveness" and "failing to provide proper payments and compensation to victims of space accidents".[61]

However, the presented analysis showed that the Convention on International Liability for Damage Caused by Space Objects was built on a certain human rights foundation. States Parties can still avoid human rights infringements if they apply the solutions that respect the human rights' spirit of this instrument.

As a *de lege ferenda* proposal, one possible approach would be to introduce amendments to the Convention, that would focus more on the human rights perspective.[62] However, from a purely practical standpoint, with full knowledge that State Parties may be hesitant to renegotiate an already accepted piece of international law, it is somewhat more realistic to appeal to State Parties to introduce internal regulations aimed at avoiding human rights infringements. In a domestic law system, legal provisions can be created that may fill the gaps caused by the Convention's limitations, e.g. by introducing an appropriate insurance system for space passengers.[63]

REFERENCES

Buyse A., *Lost and Regained? Restitution as a Remedy for Human Rights Violations in the Context of International Law,* 2008 https://web.archive.org/web/20200709023251/https://dspace.library.uu.nl/bitstream/handle/1874/32809/Restitution.pdf?sequence=1 (accessed 21.02.2023)

Christol C., *Human Rights in Outer Space,* American Institute of Aeronautics and Astronautics (AIAA). Paper No. 68-910-1967, https://doi.org/10.2514/6.1968-910

Cohen A., *Cosmos 954 and the International Law of Satellite Accidents,* 'Yale Journal of International Law' 1984, Vol. 10, https://openyls.law.yale.edu/handle/20.500.13051/6129

Couston M., *Droit spatial*, Paris 2014

[60] M.A. Potter, *Human Rights in the Space Age: an International and Legal Political Analysis*, 'The Journal of Law & Technology' 1989, Vol. 4, p. 388.

[61] M. Polkowska, 2014, *op. cit.*, p. 81.

[62] Y. Zhao, *The 1972 Liability Convention: Time for Revision?,* 'Space policy' 2004, No. 20, p. 121.

[63] More on insurance in: C. Gaubert, *Insurance in the Context of Space Activities,* (in:) F. von der Dunk, F. Tronchetti (eds), *Handbook of Space Law*, Cheltenham 2015, pp. 910-947; I. Ryzhenko, O. Halahan, *Types of Liability for Illegal Space Activities,* 'Advanced Space Law' 2019, Vol. 3, https://doi.org/10.29202/asl/2019/3/8.

Darsey M., *To the Stars, Despite Adversity: Liability for the Columbia Space Shuttle Tragedy*, 'Houston Law Review' 2005, Vol. 5

Depsey P. (ed.), *Routledge Handbook of Space Law*, New York 2017

Doo Hwan K., *Global Issues Surrounding Outer Space Law and Policy*, Hershey 2021

Freeland S., Jakhu R., *The Intersection Between Space Law and International Human Rights Law* (in:) R. Jakhu, P. Depsey (eds), *Routledge Handbook of Space Law*, New York 2017

Gaubert C., *Insurance in the Context of space activities,* (in:) F. von der Dunk, F. Tronchetti (eds), *Handbook of Space Law*, Cheltenham 2015

Harris D., O'Boyle M., Bates E., Buckley C., *Law of the European Convention on Human Rights* (2nd edition), New York 2009

Hobe S., *Legal Aspects of Space Tourism*, 'Nebraska Law Review' 2007, Vol. 86(2), https://digitalcommons.unl.edu/nlr/vol86/iss2/6

Hobe S., Schimdt-Tedd B., Schrogl K-U. (eds), *Cologne Commentary on Space Law.* Volume II, Köln 2013

Hofmański P., *Art. 13,* (in:) L. Garlicki (ed.), *Konwencja o ochronie praw człowieka i podstawowych wolności,* Vol. I, Warsaw 2010

Kerrest A., Thro C., *Liability for Damage Caused by Space Activities*, (in:) R. Jakhu, P. Depsey (eds), *Routledge Handbook of Space Law*, New York 2017

Kobielski P., *Budowa tarczy antyrakietowej w Polsce a demilitaryzacja przestrzeni kosmicznej,* (in:) Z. Galicki, T. Kamiński, K. Myszona-Kostrzewa (eds), *Wykorzystanie przestrzeni kosmicznej – Świat-Europa- Polska*, Warsaw 2010

Kobielski P., *Diplomatic Protection in Practice of European Court of Human Rights*, **'**Problemy Współczesnego Prawa Międzynarodowego, Europejskiego i Porównawczego' 2015, Vol. XIII

Polkowska M., *Prawo kosmiczne w obliczu nowych problemów współczesności*, Warszawa 2011

Potter M.A., *Human Rights in the Space Age: an International and Legal Political Analysis*, 'The Journal of Law & Technology' 1989, Vol. 4

Ryzhenko I., Halahan O., *Types of Liability for Illegal Space Activities*, 'Advanced Space Law' 2019, Vol. 3, https://doi.org/10.29202/asl/2019/3/8

Schmalenbach K., *Convention on International Liability for Damage Caused by Space Objects,* (in:) P. Gailhofer et al. (eds), *Corporate Liability for Transboundary Environmental Harm*, Springer, Cham 2023, https://doi.org/10.1007/978-3-031-13264-3_11

Smith L.J., Doldrina C., *Jurisdiction and Applicable Law in Cases of Damage from Space in Europe—The Advent of the Most Suitable Choice—Rome II*, 'Acta Astronautica' 2010, Vol. 66, https://doi.org/10.1016/j.actaastro.2009.05.008

Viikari L., *Environmental Aspects of Space Activities,* (in:) F. von der Dunk, F. Tronchetti (eds), *Handbook of Space Law*, Cheltenham 2015

Zhao Y., *The 1972 Liability Convention: Time for Revision?*, 'Space Policy' 2004, No. 20

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PROTECTION OF THE SPACE ENVIRONMENT AND SUSTAINABLE DEVELOPMENT AS A PARADIGM FOR THE DEVELOPMENT OF SPACE LEGISLATION

Abstract

Managing human activity in outer space requires a mixture of tools, including technology, economics, and law. Though technology and economics are of prime importance, the space sector needs a clear, coherent, and adequately granular regulatory environment that ensures its sustainable development and also serves sustainability on Earth. No doubt the law can be a tool for introducing sustainability into the space sector's daily life. To serve as such, law should be almost as dynamic and agile as the space activity and space environment. The space law should not only be descriptive, but it should also address new concepts such as in-orbit servicing, asteroid mining, etc. By doing so, it should also embrace the technical aspects of space activities even if they are not mandatory by international law. The lawmakers, especially national legislators, must also not be afraid to tackle new areas. The primary duty of national governments is to enhance safety and minimize risk in all, traditional and emerging space ventures, both in material and financial contexts that do not only directly affect their citizens and their assets, but also the environment, which obviously serve the entire society in an inclusive way and on a long-term basis.

The purpose of this paper is to provide a voice in the discussion on the concept of sustainable development of space activities and suitability of the existing space regulatory framework. In order to draw some conclusions, it seems necessary to analyse the notion of sustainability against the existing legal framework, so as to state whether

it is still up to date in this respect and whether it may contribute to materializing the sustainable development of the space sector. In particular, it is interesting to consider whether the liability regime, including the notion of damage and prerequisites of claims for compensation as adopted in the Liability Convention may still serve its purpose and answer the needs of the shift in the priorities of space exploration. Finally, I intend to consider the possibility of drawing on principles from other branches of law, including in particular, environmental law and insurance law and practice, in order to build legal mechanisms to implement the demands of sustainable development of space. Thus, among other issues, the topic of space environmentalism as well as the coherence of space and earth sustainability instruments will be analysed.

KEYWORDS

sustainability, space insurance, Liability Convention, prevention, precautionary approach

SŁOWA KLUCZOWE

zrównoważony rozwój, ubezpieczenia kosmiczne, Konwencja o odpowiedzialności, prewencja, podejście ostrożnościowe

"For space to support sustainability on Earth, there needs to be sustainability in space"
(Inmarsat)[1]

1. INTRODUCTION

The purpose of this paper is to provide a voice in the discussion on the concept of sustainable development of space activities on the suitability of the existing space regulatory framework. The reason of taking this subject matter is, as has been recently stated in the Opinion of the Social-Economical Committee of the EU, the fact that

> "in many respects, space is now an additional economic territory. The acceleration of public and private investment is leading to an increase in space activities, and is transforming space into a major geo-strategic issue. Technological competition, the development of start-ups dedicated to the space sector, the opening of new markets

[1] Inmarsat, Space Sustainability Report 2022, https://www.inmarsat.com/en/insights/corporate/2022/space-sustainability.html (accessed 30.01.2023).

and services and the willingness of States and private operators to strengthen in-orbit activities mean that space is being used more and more".[2]

Also, due to human's excessive activity in outer space in the past, we have found ourselves in a situation where sustainability becomes the only and the most urgent axiom for the development of space exploration. Some experts name it "space environmentalism" – a type of a cultural mind-set and call for placing it "at the heart of all satellite operations with the aim of using the space domain responsibly and with consideration of future generations".[3]

If so, the space law dominating paradigm should be the same. In particular, we should focus on answering the question of how the space law may be supportive to achieve the sustainability goal. In that respect, serious questions appear with respect to the role and suitability of the Liability Convention at its 50th anniversary.[4]

In order to draw some conclusions, it seems necessary to analyse the notion of sustainability against the existing legal framework, so as to state whether it is still up to date in this respect and whether it may contribute to materializing the sustainable development of the space sector. In particular, it is interesting to consider whether the liability regime, including the notion of damage and prerequisites of claims for compensation as adopted in the Liability Convention, still may serve its purpose and answer the needs of the shift in the priorities of space exploration. Finally, the author intends to consider the possibility of drawing on principles from other branches of law, including, in particular, environmental law and insurance law and practice, in order to build legal mechanisms to implement the demands of sustainable development of space. Thus, among other issues, the topic of space environmentalism and the coherence of space and earth sustainability instruments will be analysed.

2. ROADMAP OF SPACE ACTIVITIES: FROM EXPLOITATION TO SUSTAINABILITY

All activities undertaken in relation to outer space exploration are ultra-hazardous, inherently very risky, and random. Outer space exploration is potentially

[2] Opinion of the European Economic and Social Committee on the Proposal for a Regulation of the European Parliament and of the Council establishing the Union Secure Connectivity Programme for the period 2023–2027 (COM(2022) 57 final – 2022/0039 (COD)) and Joint Communication to the European Parliament and the Council: An EU Approach for Space Traffic Management – An EU contribution addressing a global challenge; (JOIN(2022) 4 final), OJ C 486, 21.12.2022, pp. 172–184 (hereinafter: Opinion).

[3] Inmarsat, 2022, *op. cit.*

[4] UNGA, Convention on International Liability for Damage Caused by Space Objects, RES 2777 (XXVI), adopted on 29 March 1972, in force 1 September 1972.

so harmful that an ordinary person would not regularly take on such an activity.[5] Risk in space activities is a mixture of technological, human, and nature-related perils.[6] Risks naturally present in the space sector also accommodate manmade threats which result from excessive outer space exploitation, substantially increasing the risk of damage and, most of all, endangering the possibility of long-term safe exploitation of outer space, so vital for human life on Earth. Thus the sector also faces risks that we could call emerging from a legal perspective, for which traditional legal framework is still not prepared. These are known as environmental risks. The fact is that the space environment has always been not just a source of risk (radiation, extreme temperatures, vacuum, etc.), but also a victim of human activity. However, the latter perspective has only recently knocked on our consciousness when space pollution reached such a level that it began to threaten human space activity itself.

The space environment is so unique that it is difficult to attribute actions to specific operators.[7] The most pertinent example is space debris created by human predatory activity in space, which can affect space missions and the sustainability of the sector as such. It is estimated that there are more than 30,000 objects qualified as trackable debris.[8] Collisions only with the trackable category of debris can destroy a satellite and additionally may produce more consequential debris thus having a cascading effect.[9] The danger of actual damage to be

[5] The notion of the ultra-hazardous activity has been outlined in C.W. Jenks, *Liability for Ultra-Hazardous Activities in International Law,* 'Hague Recueil' 1966, Vol. 117 as cited in Z. Brodecki, *Liability in International Law*, (in:) *Studia Europejskie*. Vol 5., Instytut Stdiów Europejskich 2000, p. 179; C.A. Parquet, *Allocation of Potential Liabilities and Risks in Launch Services Agreements,* (in:) Project 2001 Plus Workshop, Berlin, 29-30 January 2004, https://slideplayer.com/slide/4798344/ (accessed 10.07.2023); also A. Soucek, *International Law,* (in:) A. Soucek, Ch. Brunner (eds), *Outer Space in Society, Politics and Law*, Vienna 2011, p. 342.

[6] Technological hazards are mostly related to the use of highly explosive propellants needed to lift the launch vehicle and place the satellite in orbit. Any accidents related to the release of the propellant during the launch stage are known to cause explosions, debris, fire, and toxic vapour clouds. See M. Hapgood, *Space Weather, The Sun as a Natural Hazard,* (in:) R.J. Wilman, Ch.J. Newman (eds), *Frontiers of Space Risk. Natural Cosmic Hazards and Societal Challenges*, Boca Raton 2018, chapter 3, pp. 37-76; R.J. Wilman, P. Dayal and M.J. Ward, *Hazards and Habitability: Galactic Perspectives,* (in:) R.J. Wilman, Ch.J. Newman, 2018, *op. cit*., chapter 4, pp. 77-105; C. Colombo, F. Letizia, M. Trisolini, H. Lewis, *Space Debris: Risk and Mitigation,* 2018, *op. cit*., chapter 5, pp. 105-142; M. Williamson, *Commercial Space Risks, Spacecraft Insurance, and the Fragile Frontier*, 2018, *op. cit*., chapter 6, pp. 143-164.

[7] OECD, Space Sustainability. The Economics of Space Debris in Perspective, 2020.

[8] ESA, ESA's Annual Space Environment Report 2022, 22 April 2022, https://www.esa.int/Space_Safety/Space_Debris/ESA_s_Space_Environment_Report_2022 (accessed 30.01.2023).

[9] This refers to the threat of the so-called Kessler syndrome (space-asset destructive chain reaction) following the name of a NASA's expert Donald Kessler who in 1978 as the first discussed the potential of orbital debris becoming self-perpetuating. It was predicted that debris coming from collisions would collide with other satellites and rocket bodies and create even more debris. As a result of this chain reaction, the risk to satellites in certain regions of space would increase

caused by debris is just one of several hazards in the space environment.[10] The other issue concerns the electromagnetic spectrum which as a recognized natural resource is significantly shrinking due to the old inactive satellites remaining in orbits, but also to the new business models of outer space exploration, such as mega-constellations. Also, the methods of disposing of satellites contribute to the increasing pollution in outer space and on earth as de-orbiting satellites deposit more aluminium particles than all the meteorites ever do.[11] What is more, there are no universal standards for classification or cataloguing objects and modelling assumptions. Government and commercial operators' practices are increasingly predatory, leading to a growing number of threats, such as mega-constellations or anti-satellite weapons (ASAT tests by China, India and Russia).[12] Mega-constellations of small satellites also pose threats for the future such as difficulties of astronomical observations, lack of new orbital slots for vitally important types of satellites, etc. All this means that the current prospects of orbit exploration are not optimistic. The conglomerate of the above problems, the source of which is technology, business and a state of legal regulations,[13] has given rise to the new concept of developing outer space exploration. This idea is sustainability and it is present in all sectors of industry, not just the space industry.[14]

Within this concept, attention should be paid not only to the necessity of optimising environmental and social management on Earth when using satellite data but, more importantly, to the need for sustainable development of the space sector itself. The potentially damaging effects were noted long ago, though it is only recently that focus has begun to turn to the long-lasting effects of human activity. Space exploration has turned to exploitation, a notion known so well from the

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exponentially with time, even without further launches into those regions. In a 1991 paper, Kessler used the term "collisional cascading" to describe this process. This has created the widely used term "Kessler syndrome". See e.g. European Commission, Avoiding damage from space debris – space surveillance and tracking proposal, 28 February 2013, MEMO/13/149.

[10] OECD, 2020, *op. cit.*

[11] *Ibid.*

[12] O. Bittencourt Neto, *Preserving the Outer Space Environment: The "Precautionary Principle" Approach to Space Debris,* (in:) C.M. Jorgenson (ed.), *Proceedings of the International Institute of Space Law 2013 (56),* The Hague 2013, pp. 341-351; S. Cassotta, *The Development of Environmental Law within Changing Environmental Governance Context: Towards a New Paradigm Shift in the Anthropocene Era,* 'Yearbook of International Environmental Law 54-67' 2019, No. 30(1); M. Williams, *Safeguarding Outer Space: On the Road to Debris Mitigation,* (in:) *The Next Generation–Conference Report*, 31 March–1 April 2008, United Nations Institute for Disarmament Research/UNIDIR, 17 December 2008, pp. 81-101; T. Cuddihy, *Environmental Liability Risk Management for the 21st Century,* 'The Geneva Papers on Risk and Insurance. Issues and Practice' 2000, No. 25(1), pp. 128-135.

[13] The notion of "legal regulations" is understood here not just as space treaties or statutes, but also technical requirements as far as they have a general binding force.

[14] M. Stanley, *5 Key Themes in the New Space Economy*, 19 May 2022, https://www.morganstanley.com/ideas/space-economy-investment-themes (accessed 6.01.2023).

devastating effects caused also on Earth. It became obvious that new values and tools had to be adopted so that we can enter the era of sustainable space exploration. Still though, there is a general conviction that the efficiency of space environmental regulation is quite low, and there are no universal standards around the world.[15] Is this criticism also directed at the Outer Space Treaty and Liability Convention? Can these Treaties support the political shift of paradigm towards sustainable development? In order to draw reliable conclusions, an in-depth analysis is needed with respect to the notion and concept of sustainability against the assumptions and content of the existing space regulatory framework.

3. WHAT DOES SUSTAINABILITY MEAN FOR SPACE?

Sustainability is a mature notion, though not yet embedded in all sectors of industry. It was used for the first time with respect to environmental issues, but its axiom has been much broader since the very beginning. It was daylight with the 1987 Brundtland Report, "Our Common Future", and the 1992 UN Conference on Environment and Development (UNCED) ("the Earth Summit"). It was the Brundtland Report which introduced for the first time the need for the integration of economic development, environmental protection and social justice and inclusion.[16]

The Report defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It included two key concepts, i.e. (1) the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and (2) the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs. A similar concept has been adopted by the EU, introduced in the Strategy for Sustainable Development:

> "Sustainable development means that the needs of the present generation should be met without compromising the ability of future generations to meet their own needs. […] It is about safeguarding the earth's capacity to support life in all its diversity and

[15] Immarsat Report, 2022.

[16] The Earth Summit was followed by such revolutionary documents as the Rio Declaration which contained 27 principles of sustainable development, including the precautionary and polluter pays principles, Forest Principles, the Convention on Biological Diversity and the Framework Convention on Climate Change, as well as Agenda 21, which was a voluntary SD plan of action for implementation by national, regional and local governments; J. Pisani, *Sustainable Development – Historical Roots of the Concept*, 'Environmental Sciences' June 2006, No. 3(2), pp. 83 – 96. U.M. Bohlmann, G. Petrovici, *Developing Planetary Sustainability: Legal Challenges of Space 4.0.,* 'Global Sustainability' 2019, https://doi.org/ 10.1017/sus.2019.10 (accessed 30.01.2023).

> is based on the principles of democracy, gender equality, solidarity, the rule of law and respect for fundamental rights, including freedom and equal opportunities for all. It aims at the continuous improvement of the quality of life and well-being on Earth for present and future generations."[17]

The common principles of sustainable development have been recognised as inherently correlated with environmental limits and include integrated decision making (policy and legislation that works in a complementary way), "good" governance that is democratic, transparent, inclusive, participatory and accountable, and a responsible use of robust and credible scientific evidence in decision making. What seems especially interesting is the concept of boundaries which represent global Earth systems and processes within which there is a safe living space for humans and wildlife. It is argued that exceeding one or more of these boundaries could create a tipping point where the global Earth system may shift into a permanently less hospitable state. There are nine recognized boundaries, but none of them directly relate to the [state of the] outer space.[18] Thus, it was necessary to design architecture of sustainability which would respond to the specifics of outer space exploration.

As for Earth, the sustainable development concept in the space sector is to be an answer to the problem of growth in the space industry. The main statement in the Stockholm Conference in 1972 (though concerning the earth environment) looks like it addresses the consequences of the human exploitation of the Earth's orbits. It was said then, that:

> "A point has been reached in history when we must shape our actions throughout the World with a more prudent care for their environmental consequences. Through ignorance or indifference, we can do massive and irreversible harm to the earthly environment on which our life and well-being depend. Conversely, through fuller knowledge and wiser action, we can achieve for ourselves and our posterity a better life in an environment more in keeping with human needs and hopes. To defend and improve the human environment for present and future generations has become an imperative goal for mankind".[19]

The first works on the sustainability concept with respect to the space sector were undertaken a few years ago, along with active debris removal (ADR) initia-

[17] The Renewed EU Sustainable Development Strategy as adopted by the European Council on 15/16 June 2006, Brussels, 26 June 2006, 10917/06.

[18] These are climate change, change in the biosphere integrity (biodiversity loss and species extinction), stratospheric ozone depletion, ocean acidification, biogeochemical flows, land-system change (such as deforestation), freshwater use, atmospheric aerosol loading (microscopic particles in the atmosphere that affect climate and living organisms), introduction of novel entities (e.g. organic pollutants, radioactive materials, nanomaterials, and micro-plastics). Sustainability Guide, *Planetary Boundaries*, https://sustainabilityguide.eu/sustainability/planetary-boundaries/ (accessed 10.07.2023).

[19] United Nations, as quoted in J. Pisani, *Sustainable Development – Historical Roots of the Concept*, 'Environmental Sciences' June 2006, No. 3(2), p. 91.

tives.[20] Though not yet in a structured way, space stakeholders started considering how to stop and reverse the trend of exploiting outer space without due regard to future generations. An analysis of the attempts to regulate this issue in the space sector shows numerous documents that focus on space debris. The latest ones try to deal with the problem of debris through the prism of the concept of sustainability. The first document to mention the need for sustainable development seems to be the European Code of Conduct, proposed in 2004. It tried to turn the public attention to how important it is to understand the nature of the threat and the steps that we must take to ensure the sustainable development of near-Earth space. Though not successful, it commenced the era of discussing the necessity to adopt coherent measures in that respect. The draft Code of Conduct did not define the notion of sustainability. The same was the case in the Space Debris Mitigation Policy for Agency Projects adopted by ESA on 28 March 2014,[21] the Space Debris Mitigation Guidelines issued by IADC,[22] the COPUOS 2010 Space Debris Mitigation Guidelines[23] and Recommendation ITU-R S.1003-2 on Environmental protection of the geostationary-satellite orbit S Series.[24] Nevertheless, the direction set in those documents led gradually to a more comprehensive (than just space debris) approach taken by the UN and by European and national legislators.

The first document at the international level that directly addressed the concept of sustainability seems to be the proposal of the Committee on the Peaceful Uses of Outer Space, adopted at the Fifty-ninth session on 8-17 June 2016 which concerned the first set of guidelines together with a renewed work plan for the Working Group on the Long-term Sustainability of Outer Space Activities of the Scientific and Technical Subcommittee.[25] It was followed by the Guidelines for the Long-term Sustainability of Outer Space Activities, which define such activities as

[20] C. Toussaint, H. Dumez, *On the Emergence of an Active Debris Removal Market*, (in:) *Earth's Orbits at Risk: The Economics of Space Sustainability*, OECD Publishing 2022, https://doi.org/10.1787/fc689ef6-en (accessed 6.01.2023).

[21] ESA/ADMIN/IPOL(2014)2, https://www.iadc-home.org/documents_public/file_down/id/4150 (accessed 30.01.2023).

[22] IADC, https://orbitaldebris.jsc.nasa.gov/library/iadc-space-debris-guidelines-revision-2.pdf (accessed 10.07.2023).

[23] UNOOSA, https://www.unoosa.org/pdf/publications/st_space_49E.pdf (accessed 30.01.2023).

[24] Recommendation ITU-R S.1003.2 (ITU), https://www.itu.int/dms_pubrec/itu-r/rec/s/R-REC-S.1003-2-201012-I!!PDF-E.pdf (accessed 30.01.2023).

[25] These guidelines were followed by the Resolution No. 75/36 of 7 December 2020, A/RES/75/36, where the UN COPUOS expressed "the desire that all Member States reach a common understanding of how best to act to reduce threats to space systems in order to maintain outer space as a peaceful, safe, stable and sustainable environment, free from an arms race and conflict, for the benefit of all, and consider establishing channels of direct communication for the management of perceptions of threat".

> "the ability to maintain the conduct of space activities indefinitely into the future in a manner that realizes the objectives of equitable access to the benefits of the exploration and use of outer space for peaceful purposes, in order to meet the needs of the present generations while preserving the outer space environment for future generations."[26]

That idea was picked up to become the main axiom of the modern regulation of space activity. The most recent document worth citing is the Opinion of the European Economic and Social Committee.[27] It indicates the management of space traffic, including debris, as the highest priority and calls for the practical implementation of a space situational awareness system to ensure long-term sustainability of space for all Member States. As has been noted by the Social Economic Committee,

> "the challenges posed by orbit and frequency spectrum saturation, as well as the threat posed by the increase in space debris, have led the Member States, the ESA and the EU SST consortium to consider better coordination of surveillance tools and technologies. The EESC calls for strict regulations in the face of an increasing number of private constellations and possible no-go zones."[28]

The last sentence of this statement calls into question the suitability of the existing legal framework to the needs of sustainable development.

4. IS THE EXISTING REGULATORY FRAMEWORK UP TO DATE?

Having the above in mind, the first question that emerges is whether sustainable development is really such a new quality. If we look into the components of its definition, we have to realize that at least part of it is apparently not new. It has been based, at least partially, on the principles of space exploration included in the Space Treaties, especially in Outer Space Treaty.[29] By this, I mean the

[26] COPUOS, Guidelines for the Long-term Sustainability of Outer Space Activities, 27 June 2018, 5A/AC.105/2018/ CRP.20.

[27] Opinion, 2022, *op. cit.*

[28] *Ibid.*

[29] The principles set in the Space Treaties (Convention on International Liability for Damage Caused by Space Objects (done 29 March 1972, in force 1 September 1972); Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (done 22 April 1968, in force 3 December 1968); Convention on Registration of Objects Launched into Outer Space (done 14 January 1975, in force 15 September 1976); Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (done 18 December 1979, in force 11 July 1984)) have been preceded by UNGA 18th Session, Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, 13 December 1963, Resolution 1962 (XVIII).

principle of equal access to the benefits of exploration, peaceful purposes of this exploration, as well as responsibility rules. Special emphasis is put on "equitable access" to outer space's benefits for all the countries regardless of their technical and financial capacities, which corresponds to the "needs" as mentioned in the Brundland Report. What is new, however, is the concept of being able to maintain the conduct of space activities into the infinite future, which corresponds to the element of "limitation" in the said Report. This is definitely a new approach to risk management in the space sector which luckily reverses the trend mirrored well in the quote "*Apres nous le deluge"*. The space environment itself becomes the object of protection, not only the stage of the polluting drama.

However, the change in attitude and gaining a "space environmental mindset" is only the first step and including sustainability in official documents does not automatically mean that the space sector will start acting accordingly. This is due to several reasons. First of all, the binding force of the rules adopted by the UN as well as by other organizations is problematic. Secondly, the principles that were sufficient to support the interests of countries in the 1960s-70s no longer seem so suitable for the purpose of embarking on the path of sustainable development. This is also pointed out by the Social and Economic Committee in its opinion which reads that:

> "While main principles have been adopted following five international treaties and eight international resolutions, the issue of defining space law is still up in the air, since concerns at the start of space exploration had mostly been about preventing leading space powers from appropriating celestial bodies, rather than explicitly defining the subject matter of this law. Additionally, "despite the strategic magnitude of space, there is no overarching authority or any binding laws applicable to low and geostationary orbits, and there is no space traffic regulation or management system, despite an increase in the number of satellites in orbit."

As has been raised in the Opinion, organizations that govern the use of Earth orbits are facing frequency allocation requests and the proliferation of satellite systems from countries and businesses that sometimes disregard ITU rules, even though under international law[30] earth orbits are considered limited natural resources. Proper legislation on space activities and satellite traffic to ensure the long-term sustainability of space is [thus] urgent as well as strategic, as is the use of artificial intelligence to avoid collision risks.[31]

What makes the good intention also problematic is not only the lack of binding force of the documents adopted by international organizations, which eventually have a chance of becoming a custom, but also lack of coherence of technical

[30] Constitution of International Telecommunication Union, UNTS 1825, https://www.itu.int/en/council/Documents/basic-texts/Constitution-E.pdf (accessed 30.01.2023).

[31] Opinion, 2022, *op. cit*., para. 2.5.

standards, on which the behaviour of the space explorers ultimately depends.[32] These differences between modern environmental regulations and space law are quite apparent at every level. While the environmental law is being actively amended with the increasing pollution and climate change, the space law is stalled in its inability to reach a global consensus on the obvious needs of mankind.

A short overview can be helpful in order to realize what rules we operate with respect to reducing the threat to outer space through standards, principles and rules of responsible behaviour. Apart from the above-mentioned principles of the Space Treaties, the UN General Assembly Resolution 75/36 includes statements on encouraging member states, inter alia, to characterize activities that can be considered responsible, irresponsible or threatening, and their potential impact on international security, analyse existing and potential threats and risks to the security of the space system, including those arising from activities, or systems in space or on Earth, share ideas on the further development and implementation of standards, regulations and principles of responsible behaviour and the reduction of risks and misunderstandings and miscalculations with regard to space.[33] On the level of technical standards, we can mention technical norms belonging to the ISO family that deal with space debris risks, etc.[34] National laws too, in particular recently adopted ones, include certain rules worth noting. One of such example may be the Space Industry Act adopted in 2018 by the United Kingdom.[35] The first axiom of the new regulation is sustainable development of the space sector.[36] The provisions of the Act (though it does not define sustainability) mention "environmental objectives set" as one of the paradigms of the Act's regulation and prescribe an extensive obligation to perform environmental impact assessment as one of the conditions to obtain a space license. What is equally important is the executive regulation issued by the licensing authorities, i.e. the UK's Civil Aviation Authority (CAA)'s, where the space licensing guidance,[37] based on the sus-

[32] As a well-known example is the case of India, Angels, *Space Licencing in India,* https://spacelaws.com/articles/space-licensing-in-india/ (accessed 30.01.2023).

[33] UNGA Resolution 75/36, 13.07.2021, Reducing space threats through norms, rules and principles of responsible behaviours.

[34] ISO 24113:2019 on 'Space debris mitigation requirements', ISO 27852:2016 on 'Estimation of orbit lifetime', as well as ISO/TR 16158:2021 on 'Avoiding collisions among orbiting objects'; ISO 26900:2012 on 'Orbit data messages'; ISO 13526:2010 on 'Tracking Data message'; and finally ISO 14200:2021— Guide to process-based implementation of meteoroid and debris environmental models (orbital altitudes below GEO + 2 000 km).

[35] https://www.legislation.gov.uk/ukpga/2018/5/contents/enacted/data.htm (accessed 24.01.2023).

[36] "We are engaging with industry to stimulate sustainable interest in the UK launch market and in the operation and use of UK spaceport services": L. Hughes, *Liabilities & Insurance*, UN COPUOS LSC – 2018; https://www.unoosa.org/documents/pdf/copuos/lsc/2018/tech-01.pdf (accessed 10.07.2023).

[37] CAA, Applying for a licence under the Space Industry Act 2018. CAP 2209, https://publicapps.caa.co.uk/docs/33/Applying%20for%20a%20licence%20under%20the%20Space%20Industry%20Act%202018%20(CAP2209)%20(1).pdf (accessed 30.01.2023).

tainability principle, provides explanation to sustainability. It says that it must be ensured that activities licensed in orbit are sustainable and it makes this objective enforceable by imposing specific requirements on environmental and other risk assessment. The notion of the sustainability is repeated in the context of space activity as such that meets the requirements of the present without compromising the ability of subsequent generations to embark on activities (or missions) to meet their own requirements in the future. Sustainability is inherently linked to safety and security: whereas safety and security look to mitigate impacts of spacecraft activities on the operations of existing spacecraft, sustainability attempts to mitigate the impacts of spacecraft activities on the future environment. The other good example seems to be the Belgian space law.[38] In accordance with its provisions, environmental impact assessment (ground and space) includes now assessment of the impact of the use/operation of space resources. Additionally, a new warning procedure in case of failure of a space object registered in Belgium (internal and external) has been introduced.

Though only under discussion stage, it is also worth mentioning the Polish draft of space law which is to provide for a rule that space activities at every stage are carried out with consideration of the need for long-term sustainable use of space for peaceful purposes and eliminate or reduce to the greatest extent possible the negative impact on the Earth's environment and on space. However, the technical rules which make the new sustainable manifesto an enforceable obligation would be equally significant. Thus it is proposed that the technical requirements of the Polish space law provide an explicit rule that the space of low Earth orbit and the space of geostationary Earth orbit are protected spaces and that the space objects must be designed in a way that does not result in space debris being released into Earth orbit. The law should provide enforceable requirements that ensure that intentional generation of space debris during normal space operation is avoided. It is also important that the operator applying for the license provide an analysis of the risk of collision of a space object in the orbit where the space object will perform a space mission.

The conclusion that follows from the above brief presentation of standards that can contribute to the materialization of sustainable development of the space sector is that the general principles themselves, however necessary and legitimate, will not bring effective changes without coherence of regulations binding for and enforceable on entities performing space activities. Though, as can be seen from the regulatory framework to date at the international, regional (e.g. European Union) or national level, the homogeneity exists only at the level of principles, while implementing regulations, where they have even been introduced (it should

[38] Law of 17 September 2005 concerning activities relating to the launch, flight operations or guidance of space objects. It was amended in 2013, the Executive Order was adopted in 2008 and amended in 2022. Belspo, *The Belgian Space Law*, https://www.belspo.be/belspo/space/belaw_en.stm (accessed 10.07.2023).

be noted that only about 30 countries have adopted space laws), lack coherence. The Economic and Social Committee points this out, confirming that the main problem concerning the patchwork of space traffic management (STM) programs is the absence of international standardization. It is therefore clear that standards, guidelines and international best practices need to be developed.[39]

One of the important issues that needs further analysis in the context of its usefulness for the sustainable development objectives is the principle of liability and the manner of its implementation and enforceability. As mentioned earlier, it seems that the basic principles of space exploration contained in the Space Treaties are essentially in line with the concept of sustainable development. The regime of liability for damage is one of the main legal issues potentially supporting its enforcement and it has been also recognized as such by the Economic and Social Committee. It said that liability for damage is the second key principle of space law consisting of international responsibility for monitoring activities, and liability for damages caused by these activities in outer space. In this regard, it seems necessary to reflect on whether the principles of responsibility adopted in the Liability Convention are able to bear the burden of the new reality.

5. PARADIGM SHIFT IN LIABILITY PRINCIPLES – NECESSITY OF OUR TIMES

The question thus emerges whether the Liability Convention can be a starting point for the development of sustainability? Does it address the needs of space environmental protection or do we need to search for a new paradigm when facing the requirements of sustainable development? As stated in sections 2 and 3 of this paper, the principles included in the Convention which have already been established in our consciousness can still be of great use. They do not contradict or deviate in their content from what we want to achieve. These are among others the peaceful use of the outer space, observing the interests of all the nations or avoiding harmful interferences. The fact is, however, that behind each of them also lurk traps that result from the current state of facts, so the way we interpret these principles must evolve.

Though the issue requires an in-depth but also horizontal analysis, below I would like to focus on the notion and concept of damage as regulated in the Outer Space Treaty as well as in the Liability Convention against modern regulations of the "terrestrial" environmental law. In that respect, apparent differences

[39] See more in A. Soucek, J. Tapio, *Normative References to Non-Legally Binding Instruments in National Space Laws: A Risk-Benefit Analysis in the Context of Public International and Domestic Law*, 'Proceedings of the International Institute of Space Law' 2018.

between modern environmental regulations and space regime seem to appear. The analysis could start from important elements related to the existing liability regime.

Firstly, there is no precise definition of the space environment in the space law. Instead, there are many different concepts deriving from various branches of science. From the legal point of view, jurisprudence focuses on where space begins and whether it needs to be defined. It is however doubtful whether equating space beyond the nondescript boundary of outer space and the space environment is the right approach. The wording of the Moon Treaty may provide some guidance, as its Article I tries to identify some elements of the space environment, by saying that the Agreement should apply to the Moon and also to other celestial bodies within the solar system other than the Earth and that the Moon shall include orbits around or other trajectories to or around it. Due to the low ratification ratio of the Moon Agreement it cannot be treated as a leading document to judge on this issue. From the point of view of the common knowledge, but also taking into account the engineering approach, we may find an explanation that "Space environment is a branch of astronautics, aerospace engineering and space physics that seeks to understand and address conditions existing in space that affect the design and operation of spacecraft" (wiki).[40] Also the educational materials produced by FAA explain what space environment is, "where space begins, (…) our place in the universe (…) and the major hazards of the space environment and their effects on spacecraft (…)."[41] On the other hand, the ITU Constitution equals the space environment to "radio frequencies and any associated orbits, including the geostationary satellite orbit", which also does not sound satisfactory.[42] Other documents, such as the OECD Report,[43] correlate space environment with the vaguely listed exemplary components such as Earth's orbit, and electromagnetic spectrum.[44] The definition of terrestrial environment can be quoted for comparison. It has been defined as a set of natural elements, including those transformed by man. In particular, these include (as an exemplary catalogue) inland waters, air, land surface, minerals, plant and animal world, as well as both natural and human-transformed landscape and climate, and other elements of biodiversity, as well as their interactions.[45]

[40] 'Space environment', *Wikipedia*, https://en.wikipedia.org/wiki/Space_environment (accessed 30.01.2023).

[41] FAA, *The Space Environment*, https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/cami/library/online_libraries/aerospace_medicine/tutorial/media/III.4.1.2_The_Space_Environment.pdf (accessed 30.01.2023).

[42] ITU Constitution, Chapter VII, Article 44.

[43] OECD, 2020, *op. cit.*

[44] *Ibid*.

[45] Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage, OJ L 143, 30.4.2004, pp. 56–75.

Secondly, the concept of damage to the space environment does not exist or is vague. It seems that this aspect requires a substantial change in thinking. What we are able to derive from the Space Treaties, in particular the Outer Space Treaty and the Liability Convention, is an understanding of damage focused on human life and health as well as man's tangible assets. According to the Liability Convention, the damage as defined in Article I includes (1) loss of life, (2) personal injury or other impairment of health, or (3) loss of or damage to property of States or of persons, natural or juridical, or property of international intergovernmental organizations. Consequently, the liability regime of the Liability Convention focuses on the damage which has already occurred to persons or tangible assets owned by humans. No damage to the environment as such is subject to the liability regime.

In consequence, it seems necessary that the understanding of the damage in the space liability regime is expanded so as to include environmental damage as well. To do so, however, it is necessary, to first identify the elements of the space environment to be protected. This topic undoubtedly requires a broader analysis. For the purposes of this paper, an evident element of this environment are Earth's orbits. Undoubtedly, precision is needed in this regard and most probably the definition outer space frontiers. This issue may also be compared with earthly environmental regulations. As an example, the 2004 Environmental Liability Directive defines environmental damage as damage to protected species and natural habitats, water damage, and land damage.[46]

To summarize this part of the discussion, it seems that the basic principles of space exploration provided in the Space Treaties are not very different from the principles and expectations the society has with respect to sustainable development. The good starting point is the status of the space environment as an environment subject to equal freedom of exploration and exploitation by all nations. What makes them different is, however, their focus on (1) the exploitation and not preservation of the space environment, (2) the direct effects on human beings, their property, and eventually on the protection of the earth's environment, (3) the damage that has already happened and compensation for it, as well as (4) lack of binding force of technical standards. The above form apparent differences between modern environmental regulations and the actual status of the space liability regime.

[46] *Ibid.*: Environmental damage means any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species. The significance of such effects is to be assessed with reference to the baseline condition, taking account of the criteria set out in Annex I to the Directive. It also means any damage that significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential, as defined in Directive 2000/60/EC, of the waters concerned, with the exception of adverse effects where Article 4(7) of that Directive applies.

What are the solutions for such a state of affairs? Despite numerous opinions, standpoints or voices, we have to realize that adopting a new or revised liability regime on the international level is wishful thinking. However, when it is compared with the legal framework for protection of the terrestrial environment, the situation is not so different. The majority of legal documents, such as the 1992 Rio Declaration are also of non-binding nature. Numerous international acts remain soft law instruments that only include political declarations of the States Parties. Still, the postulates included therein gained the status of binding laws, in majority *via* regional (such EU) laws, and have been implemented into national legislation. Thus, when we look at the type of rules of space law and their effectiveness as compared with the environmental law, we must realize that what is ultimately needed is the national laws that are enforceable against space actors.

6. COMPENSATION VERSUS PREVENTION

An issue that requires a separate analysis is the effectiveness of the liability regime for space damage in the context of damage prevention. As raised on several occasions earlier in the paper, and which is particularly relevant to the efficiency of prevention efforts, the binding nature of provisions regulating liability for damage takes place only at the level of the principles expressed in the Space Treaties. All technical norms, proposed so far by various international and regional bodies in the context of the prevention of space debris, are soft law standards. In this regard, the shortcomings of the concept of damage as defined in the Liability Convention are apparent. They are related to (1) the necessary attribution of the damage to the activity of the space object and to (2) the damage which has already occurred. Both these issues are important when considering entering the path of sustainable development.

As regards the first issue, some doubts appear whether in the current state of technology and in the face of a huge variety of space activities, attributing the regime of liability only to damage caused by a space object ensures the proper protection of the space environment. There are calls for a change of that rule in such a way that liability for space damage is not limited solely to damage caused by a space object, but by any type and form of space activity. Such an approach seems to be necessary, or at least reasonable, due to the significant development of satellite technology and techniques compared to the period when the Liability Convention was drafted. These days we experience the emergence of new types of activities, often beyond launching objects into orbit. This includes activities such as on-orbit servicing, space mining and others, which, although only in the early stages of development, must be taken into account when building a liability

regime serving the future generations. It is especially true since interpretations of the Liability Convention proved to be quite narrow (e.g. including just kinetic impact of space objects). Doubts about the limitation of such liability solely to damage caused by a space object began to arise soon after the adoption of the Convention. An extensive body of relevant literature points to numerous controversies on at least the causal relationship between the damage and the impact of the space object.[47] Out of the ways in which the impact of a space object can result in international liability, one can mention both the kinetic impact of the object as well as the radioactive or chemical contamination. It is now obvious that damage, including damage of large magnitude and catastrophe character, can be caused without (at least directly physical) an impact of a space object, but may still result from space activities (e.g., due to the use of space fuel) where no space object was involved. Reconsidering this issue the same way as has been done in the environmental law should at least be an inspiration.[48]

Equally important is the matter of attributing the liability regime only to the damage that has already occurred. It is a part of larger subject matter of prevention and precaution as a principle of outer space exploration. Can we derive the preventive approach from the Space Treaties? An analysis of the Space Treaties brings a conclusion that the preventive approach is expressed there in a very soft manner and basically focuses on the protection of humans and earth environment. Prevention has been mentioned in the preamble of the Liability Convention which says that "notwithstanding the precautionary measures to be taken by States and international intergovernmental organizations involved in the launching of space objects, damage may on occasion be caused by such objects", though no further provisions even mention the issue of prevention in the context of liability regime. In turn, the Outer Space Treaty, in its Article IX states that

> "States Parties to the Treaty shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose".

As we can deduct from the above provision, an obligation to avoid causing harmful contamination can be interpreted as a precautionary approach, but it concerns solely the Earth environment. As regards the obligation related to the danger of harmful interference or contamination, it seems to be limited to the duty of information and consultation. In particular, no obligation to prevent damage or to take precautionary actions has been repeated in the Liability Convention so that

[47] B. Cheng, *International Responsibility and Liability for Launch Activities*, 'Air & Space Law' 1995, Vol. XX, No. 6.

[48] In Annex III, ELD provides for types of activities to which a strict regime of liability is attributed.

we could derive any liability from the omission to prevent the damage under this Convention.[49] The prevention approach is though present in the space regulatory framework. The Active Debris Removal solutions are all quite clearly based on the prevention and precautionary approach. On the international level, they are however "just" soft law measures.

On the other hand, the prevention and precaution approach very firmly resounds in environmental law. There are clear provisions for that purpose included in national and EU law as to the obligation to take preventive action before the damage occurs and the consequences of evading them. The principle of precaution emerged for the first time in the Rio Declaration of 1992. It was related to the clear purpose of protecting the environment: "in order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities". The now famous Article XV says: "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation". Following that, a precautionary approach has been proposed in some treaties, such as UNFCC.[50] At the European level, the precautionary principle was enshrined in the Maastricht Treaty in 1992. It is now included in Article 191 of the Treaty on the Functioning of the European Union among the principles underpinning EU environmental policy.[51]

Having all the above in mind, some basic comparisons between environmental and space law can be made with respect to the policy of law and its efficiency. In both cases, the branch of law emerged and started to develop at the same time, that is in the 1970s. In both cases, there are only few generally binding acts of international law, numerous soft law instruments, and a few dozen binding national laws. Finally, it is a national law that ensures the effectiveness of the principles created at the international level, where there is often nothing more than

[49] The further part of Art. IX of OST says that:

> "If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A State Party to the Treaty which has reason to believe that an activity or experiment planned by another State Party in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, may request consultation concerning the activity or experiment."

[50] Article 3(3) of the 1992 United Nations Framework Convention on Climate Change (A/RES/48/189), as well as the preamble to the 1992 Convention on Biological Diversity (1760 UNTS 69).

[51] See more in: D. Bourguignon, *The Precautionary Principle. Definitions, Applications and Governance*, European Parliament, December 2015, PE 573.876, https://www.europarl.europa.eu/RegData/etudes/IDAN/2015/573876/EPRS_IDA(2015)573876_EN.pdf (accessed 10.07.2023).

a political manifesto of the states-parties. For this reason, it seems that we should not focus on the fact that the Liability Convention is out of date, and that it lacks effectiveness. The effectiveness of the law is ensured by national laws, and that primarily includes norms of a technical nature. When thinking about sustainable development, attention should be focused on the bottom-up activities of national authorities that impose licensing obligations. These requirements should have a common denominator and be globally coherent. Perhaps, then, there is no need to wait for Godot in the form of appropriate changes to the Space Treaties, as the Kessler syndrome may materialize before we embark on the path of sustainable development. The lack of coherence of technical standards has been pointed out for some time now not only by engineers but also by representatives of jurisprudence. And the problem, in particular, is becoming acute in the face of Space 4.0 and the intense growth of New Space, which by its very nature has yet to develop good practices and technical know-how.[52]

While there may be too many differences between space law and environmental law to simply incorporate or copy protective rules included in the "terrestrial" environment law into space law, it is worth considering using the methodology applied in environmental law to the liability regime and attributing it not only to the space object and not only to the damage that occurred. National legislators are faced this task now. Although they are obliged by the Outer Space Treaty to adopt a national law, they can and should adopt it in such a form that will adapt the regime contained in the Liability Convention to the requirements of sustainable development. What we can do, therefore, is to consider adopting three elements present in modern environmental laws. Firstly, it is worth involving different kind of actors with different takes on the issue as an interdisciplinary approach seems necessary due to the complexity of the problems. Secondly, a focus on public- private interactions, also in terms of law (between hard law and soft law measures), would be reasonable and practical. And thirdly, the issue of great importance is preventing "flags of convenience" which will be possible only when technical requirements ensuring the sustainable activity in outer space are globally coherent. Thus, strengthening synergies among different levels would seem to be a desired course of action. This could consist of (1) application of the Space Treaties on the level of principles, (2) introducing actions on the level of regions (such as the EU), (3) pursuing the path of Artemis Accords ("artemization" of international space law), (4) long term activity of inter-governmental or non-governmental bodies, setting universal standards, such as the ISO or ADR by IADC, and finally (5) introducing enforceable law on national level. All these might lead

[52] M. Szwajewski, K. Malinowska, *Coherence of Engineering Models for the Prediction of Debris in Terms of Space Licensing. Case of Small Satellites,* (in:) T. Flohrer, S. Lemmens, F. Schmitz (eds), *Proceedings of the 8th European Conference on Space Debris* (virtual, Darmstadt, Germany, 20–23 April 2021, published by the ESA Space Debris Office Ed. May 2021, https://conference.sdo.esoc.esa.int/proceedings/sdc8/paper/192/SDC8-paper192.pdf (accessed 6.01.2023).

to effective multi-level and interdisciplinary governance of outer space environmental protection.

With the above in mind, it is worth paying more attention to the "artemization" of international space law mentioned above. Despite criticism of the way the U.S. has acted within the promotion of the principles contained in the Artemis Accords, there has also been an increase in support for this type of method of promoting space exploration principles, also among legal scholars.[53] Perhaps, the most effective way in the recent geopolitical situation is elaborating a solution to which countries could join without having to negotiate a treaty workable for all at the same time on the forum of the United Nations. This method of regulating the space sector on the international level, different than the UN adopting treaties, proved to be quite efficient, as the Artemis Accords was signed in a short time by more countries than the Moon Agreement. As noted by Kamala Harris with respect to the ASAT ban (which is going to take a similar accession path for the states willing to join it), which also suits the situation of sustainability as nothing else:

> "Without clear norms we face unnecessary risk in space (…). The United States will work with commercial industry and allies to lead in the development of new measures that contribute to the safety, stability, security, and long-term sustainability of space activities. Through this new commitment and other actions, the United States will demonstrate how space activities can be conducted in a responsible, peaceful, and sustainable manner. It's an attempt to lead by example, and demonstrate we're willing to make this commitment ourselves and then encourage others to follow."[54]

Another issue gaining momentum is the possibility of implementing space sustainable development in European Union law by regulatory measures. The issue of harmonization of space law is problematic due to the content of Article 189 of the Treaty on the Functioning of the European Union.[55] However, could it not be considered to treat the principles of sustainable development of space exploration as part of environmental regulation? Undoubtedly, an in-depth anal-

[53] See for example R. Deplano, *The Artemis Accords: Evolution Or Revolution In International Space Law?*, 'International & Comparative Law Quarterly' 2021, No. 70(3), pp. 799-819, doi:10.1017/S0020589321000142.

[54] S. Erwin, *U.S. declares ban on anti-satellite missile tests, calls for other nations to join. VP Harris: A commitment to not destroy satellites in orbit should become a 'new international norm for responsible behavior in space'*, 'Space News', 18.04.2022, https://spacenews.com/u-s-declares-ban-on-anti-satellite-missile-tests-calls-for-other-nations-to-join/ (accessed 10.07.2023).

[55] OJ C 326, 26.10.2012, pp. 47–390. Article 189 provides the power of the EU: 1. To promote scientific and technical progress, industrial competitiveness and the implementation of its policies, the Union shall draw up a European space policy. To this end, it may promote joint initiatives, support research and technological development and coordinate the efforts needed for the exploration and exploitation of space. 2. To contribute to attaining the objectives referred to in paragraph 1, the European Parliament and the Council, acting in accordance with the ordinary legislative procedure, shall establish the necessary measures, which may take the form of a European space programme, excluding any harmonisation of the laws and regulations of the Member States.

ysis and discussion is needed in this regard. At this stage, the author fully agrees with the proposal included in the Opinion of the Economic and Social Committee that reads that

> "the ambitions set out require, in the short term, that the industry undertakes certain obligations, and, in the medium term, that the Member States draw up a legislative proposal to address the fragmentation of national approaches and avoid distortions of competition with operators established outside the EU, by imposing the principle of equal treatment for operators. Non-binding measures, such as guidelines, are also envisaged. The legislative proposal would be the first step; European organisations must then adopt technical requirements, such as universally applicable standards or guidelines".[56]

7. THE ROLE OF INSURANCE IN THE DEVELOPMENT OF SUSTAINABLE SPACE ACTIVITY

The sustainability of the space sector, as in other industries, requires a collective effort from various stakeholders in the space ecosystem. Insurers are an excellent type of such stakeholders. They are heavily involved in initiatives that will improve the space environment while reducing the risk of space exploration. They have an important role to play in the context of sustainable development of space ventures through the involvement in the risk management of space ventures such as (1) damage mitigation, (2) risk assessment for the insurer at the in-orbit stage, (3) cause of damage detection in terms of recourse actions being more possible, (4) reducing the number of catastrophic losses or TCL, both due to better loss detection and the possibility of remedying the damage.

The involvement of insurers in all the above actions means that they act as "regulators of the industry". A good example of this is the method of assessing the risks of space operations, primarily applied by the insurance industry and which has recently been increasingly taken over by national regulators. It can be seen in emerging legislations, such as in the Space Industry Act adopted in the United Kingdom, as well as risk assessment methods included in the US, Australian, and Finnish space laws, where the obligation of liability insurance is no longer set on a fixed level but adjusted to the actual level of risk related to the given space mission. The draft of Polish space law may be also mentioned, where the idea of the minimum coverage requirements for liability insurance based on an assessment of the risk of damage caused by space activities is under discussion. The safer the mission, the lower the risk, and, consequently, the lower

[56] Opinion, 2022, *op. cit.*, para. 2.11.

the insurance requirement and the easier the licensing process.[57] In the above sense, insurance of space risks is a critical enabler of innovation and investment in the space sector as it secures the interests of investors by insuring space assets. In that context, insurance "encourages" responsible behaviour in space.

When it comes the impact the space insurers may have on sustainability in the space industry, at least two contexts should be mentioned. The first one is the requirements of sustainability imposed on the insurance sector. Space applications respond to that requirement and become a desirable and promising industry helping to materialize the goals of sustainable development in general. The second refers to the liability paradigm considered in section 4 of this paper, i.e. the issue of prevention and precaution. Though traditionally space insurance covers risks that cannot be mitigated or otherwise eliminated in space projects, a clear change of paradigm can be observed which shortly can be called the shift "from risk transfer to risk prevention".[58] This new trend can also serve as support for space exploration activity. Insurers are increasingly involved (also through space applications) in prevention. Development of insurance techniques along with new technologies, such as AI, IoT, and similar, mean that the prevention and not just compensation increasingly become one of the main services of the insurers. It is well visible in cyber risk insurance and environmental insurance, where the insurers are able, in cooperation with the insured, to actively counteract the materialization of the risk and pay not just for the damage that has already occurred, but also for the preventive actions. Insurers themselves are investing in technologies that enhance loss prevention and are able to model risks and make predictions on their materialization that will enable prevention. They can therefore be partners in the discussion on sustainability in the space sector. Insurers are some of the world's most effective regulators.[59]

8. CONCLUSIONS

Managing space missions and space industry requires a mixture of tools, including technology, economics, and law. Though technology and economics

[57] A good example can be Finnish law where space missions with risk assessed results under a certain level are released from the obligation of having insurance (Section 8 of the Finnish Act on Space Activities, 63/2018).

[58] I. Flückiger, M. Carbone, *From Risk Transfer to Risk Prevention: How IoT is Reshaping Business Models in Insurance*, Geneva Association 2021, https://www.genevaassociation.org/sites/default/files/iot_insurance_research_report.pdf (accessed 10.07.2023).

[59] C. McKeon, A. Satovich, M. Simmons, C. O'Connor, B. Barger, *Boldly Insure where No one Has Gone. Commercialization of Space is a Once-in-a-Generation Opening*, ITL, 19.10.2021, https://www.insurancethoughtleadership.com/commercial-lines/boldly-insure-where-no-one-has-gone (accessed 10.07.2023).

are of prime importance, the space sector needs a clear, coherent, and adequately granular regulatory environment that ensures sustainable development. There is no doubt that regulating the matter of economic exploration of space is an extremely difficult task, even with many examples of European national laws and model concepts for such laws developed by international organizations and almost 30 states.

No doubt, law can be a tool of introducing sustainability into the space sector's daily life. To serve as such, law should be almost as dynamic and agile as the space activity and space environment. Space law should not only be descriptive to the industry's mainstream but also address new concepts such as in-orbit servicing, asteroid mining, etc. By doing so, it should also embrace the technical aspects even if they are not mandatory by international law. However, the lawmakers must also not be afraid to tackle new areas. The second area for the States is to be engaged through their laws (hard or soft) in sustainable development in a way that supports and encourages new ventures. The primary duty of the government in that respect is to enhance safety and minimize risk, both material and financial. This affects directly not only their citizens and their assets, but also the environment, which obviously serves the entire society in an inclusive way and on a long-term basis.

When thinking of sustainable space exploration, space law should not be developed in isolation from other sectors just because it is so special. For example, some elements present in modern environmental laws could serve as a pattern for the development of space sustainability regulations, at least as regards the methods of adopting new regulations. These include involving different kinds of actors with different approaches and public-private interactions also between hard and soft laws. The multi-level governance of outer space environmental protection could serve to strengthen synergies among different levels: by Outer Space Treaty and Liability Convention on the level of principles, but also, if necessary, by accepting other ways of adopting new standards of behaviour in outer space, i.e. not by a UN treaty, but also by multinational (plurinational) agreements or technical standards like ISO on a national level. And, last but not least, the change of the paradigm of managing space risks by law should visibly move away from focusing on consequences (such as compensation), to prevention and precaution.

It may be then repeated after the Committee, what we all have known for a long time, "that proper legislation on space activities and satellite traffic to ensure the long-term sustainability of space is urgent as well as strategic, as is the use of artificial intelligence to avoid collision risks". The famous quote attributed to Madame de Pompadour: "Apres nous le deluge" began to come true far too soon.

REFERENCES

Bittencourt Neto O., *Preserving the Outer Space Environment: The "Precautionary Principle" Approach to Space Debris,* (in:) C.M. Jorgenson (ed.), *Proceedings of the International Institute of Space Law 2013 (56)*, The Hague 2013

Bohlmann UM., Petrovici G., *Developing Planetary Sustainability: Legal Challenges of Space 4.0.* 'Global Sustainability' 2019, No. 2, E10, doi:10.1017/sus.2019.10 (accessed 30.01.2023)

Brodecki Z., *Liability in International Law,* (in:) *Studia Europejskie*. Vol 5. Instytut Studiów Europejskich 2000

Cassotta S., *The Development of Environmental Law within Changing Environmental Governance Context: Towards a New Paradigm Shift in the Anthropocene Era,* 'Yearbook of International Environmental Law 54-67' 2019, No. 30(1)

Cheng B., *International Responsibility and Liability for Launch Activities*, 'Air & Space Law' 1995, Vol. XX, No. 6

Colombo C., Letizia F., Trisolini M., Lewis H., *Space Debris: Risk and Mitigation*, (in:) R.J. Wilman, Ch.J. Newman (eds), *Frontiers of Space Risk. Natural Cosmic Hazards and Societal Challenges*, Boca Raton 2018

Cuddihy T., *Environmental Liability Risk Management for the 21st Century,* 'The Geneva Papers on Risk and Insurance. Issues and Practice' 2000, No. 25(1)

Deplano R., *The Artemis Accords: Evolution Or Revolution In International Space Law?*, 'International & Comparative Law Quarterly' 2021, No. 70(3), doi:10.1017/S0020589321000142

Erwin S., *U.S. declares ban on anti-satellite missile tests, calls for other nations to join. VP Harris: A commitment to not destroy satellites in orbit should become a 'new international norm for responsible behavior in space'*, 'Space News', 18.04.2022, https://spacenews.com/u-s-declares-ban-on-anti-satellite-missile-tests-calls-for-other-nations-to-join/ (accessed 10.07.2023)

ESA, ESA's Annual Space Environment Report 2022*,* 22 April 2022, https://www.esa.int/Space_Safety/Space_Debris/ESA_s_Space_Environment_Report_2022 (accessed 10.07.2023)

European Commission, Avoiding Damage from Space Debris – Space Surveillance and Tracking Proposal, 28 February 2013, MEMO/13/149

Flückiger I., Carbone M., *From Risk Transfer to Risk Prevention: How IoT is Reshaping Business Models in Insurance*, Geneva Association 2021, https://www.genevaassociation.org/sites/default/files/iot_insurance_research_report.pdf (accessed 10.07.2023)

Hapgood M., *Space Weather, The Sun as a Natural Hazard,* (in:) R.J. Wilman, Ch.J. Newman (eds), *Frontiers of Space Risk. Natural Cosmic Hazards and Societal Challenges*, Boca Raton 2018

Inmarsat, Space Sustainability Report 2022, https://www.inmarsat.com/en/insights/corporate/2022/space-sustainability.html (accessed 30.01.2023)

Jenks C.W., *Liability for Ultra-Hazardous Activities in International Law,* 'Hague Recueil' 1966, Vol. 117

McKeon C., Satovich A., Simmons M., O'Connor C., Barger B., *Boldly Insure where No one Has Gone. Commercialization of Space is a Once-in-a-Generation Opening*,

ITL, 19.10.2021, https://www.insurancethoughtleadership.com/commercial-lines/boldly-insure-where-no-one-has-gone (accessed 10.07.2023)

OECD, Space Sustainability. The Economics of Space Debris in Perspective, 2020

Parquet C.A., *Allocation of Potential Liabilities and Risks in Launch Services Agreements,* (in:) *Project 2001 Plus Workshop*, Berlin 29-30 January 2004, https://slideplayer.com/slide/4798344/ (accessed 10.07.2023)

Pisani J., *Sustainable Development – Historical Roots of the Concept*, 'Environmental Sciences' June 2006, No. 3(2)

Soucek A., *International Law,* (in:) A. Soucek, Ch. Brunner (eds), *Outer Space in Society, Politics and Law*, Vienna 2011

Soucek A., Tapio J., *Normative References to Non-Legally Binding Instruments in National Space Laws: A Risk-Benefit Analysis in the Context of Public International and Domestic Law*, 'Proceedings of the International Institute of Space Law' 2018

Szwajewski M., Malinowska K., *Coherence of Engineering Models for the Prediction of Debris in Terms of Space Licensing. Case of Small Satellites,* (in:) T. Flohrer, S. Lemmens, F. Schmitz (eds), *Proceedings of the 8th European Conference on Space Debris* (virtual, Darmstadt, Germany, 20–23 April 2021, published by the ESA Space Debris Office Ed. May 2021), https://conference.sdo.esoc.esa.int/proceedings/sdc8/paper/192/SDC8-paper192.pdf (accessed 6.01.2023)

Toussaint C., Dumez H., *On the Emergence of an Active Debris Removal Market*, (in:) *Earth's Orbits at Risk: The Economics of Space Sustainability*, OECD Publishing 2022, https://doi.org/10.1787/fc689ef6-en (accessed 6.01.2023)

Wilman R.J., Dayal P., Ward M.J., *Hazards and Habitability: Galactic Perspectives,* (in:) R.J. Wilman, Ch.J. Newman (eds), *Frontiers of Space Risk. Natural Cosmic Hazards and Societal Challenges*, Boca Raton 2018

Williamson M., *Commercial Space Risks, Spacecraft Insurance, and the Fragile Frontier,* (in:) R.J. Wilman, Ch.J. Newman (eds), *Frontiers of Space Risk. Natural Cosmic Hazards and Societal Challenges*, Boca Raton 2018

Williams M., *Safeguarding Outer Space: On the Road to Debris Mitigation,* (in:) *The Next Generation—Conference Report*, 31 March–1 April 2008, United Nations Institute for Disarmament Research/UNIDIR, 17 December 2008.

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THE CONCEPT OF LONG – TERM SUSTAINABILITY OF OUTER SPACE ACTIVITIES AND THE INTERNATIONAL RESPONSIBILITY OF STATES FOR SPACE ACTIVITIES

Abstract

The concept of long-term sustainability of outer space activities is based on rational assumptions regarding outer space as a limited resource, which will inevitably shrink in the long term if States do not take appropriate preventive measures. The arguments for this are all the stronger as it concerns a real threat to the safety of space operations, and what is more, to their continuation in the future. The legal status of outer space determines the responsibility of States for the activities of both governmental and non-governmental entities. The UN COPUOS Guidelines for the Long-term Sustainability of Outer Space Activities strongly remind of this. This is an important element of this document, which should be considered not only in the context of liability for damage caused as a result of space activities, but also in the context of liability for violating the principles adopted in the key treaty of international space law, which is the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of 27 January 1967.

The main purpose of this article is to present the assumptions of the concept and, in their light, to refer to its structural treaty connotations in the field of generally recognized international responsibility of the State for space activities. The study is also intended to show workable solutions adopted in national law that implement the COPUOS Guidelines,

as a necessary and inevitable direction of national activity of countries wanting to explore and use outer space safely and responsibly.

KEYWORDS

international responsibility for national activities in outer space, long-term sustainability of outer space activity, space debris

SŁOWA KLUCZOWE

odpowiedzialność międzynarodowa za narodową działalność w przestrzeni kosmicznej, długoterminowa trwałość działań w przestrzeni kosmicznej, śmieci kosmiczne

I. THE ESSENCE OF THE CONCEPT OF LONG-TERM SUSTAINABILITY OF OUTER SPACE ACTIVITIES AND ITS SOURCE

The concept of long-term sustainability of outer space activities was born out of real concerns about the future of space exploration and use. As to its essence, its goal is to reduce the negative impact of space activities on the outer space environment, recognizing its extremely significant role in shaping the standard of life on Earth and ensuring its safety. In addition to the benefits of modern technologies applied with the use of outer space, extraction of natural resources from celestial bodies may become quite realistic in the next few years. The opportunities and benefits that space exploration and use give us, therefore, sufficiently justify the postulate of the concept, according to which space activity must be "sustainable over the long term".[1]

Work on the relevant guidelines for long-term sustainability of outer space activities began several years ago within the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS). On 18 February 2010, the Scientific and Technical Subcommittee of COPUOS established the Working Group on the Long-term Sustainability of Outer Space Activities.[2] It was entrusted with the preparation of a document whose main goal would be the sustainable use of

[1] UNOSA, *Long-term Sustainability of Outer Space Activities*, https://www.unoosa.org/oosa/en/ourwork/topics/long-term-sustainability-of-outer-space-activities.html (accessed 10.10.2022).

[2] UNGA, Report of the Scientific and Technical Subcommittee on its forty-seventh session, held in Vienna from 8 to 19 February 2010, A/AC.105/958, para. 181.

outer space to guarantee the durability, stability and security of space activities of States. As noted by Peter Martinez, chairman of the Working Group in 2011-2018, referring to the terminology used in the Guidelines, "the term 'space sustainability' has entered into common use in the English-speaking space community as a way to refer to (...) concerns relating to outer space as an environment for carrying out space activities safely and without interference, as well as to concerns about ensuring continuity of the benefits derived on Earth from the conduct of such space activities".[3]

As a result of the work undertaken, in 2016, COPUOS approved the Guidelines for the Long-term Sustainability of Outer Space Activities: first set.[4] Some new guidelines were adopted in 2019 with a preamble and nine additional paragraphs.[5] The introduction to the document states that the space environment is a limited resource used by an increasing number of States and non-governmental entities. It was noted that the increase in the number of space debris, the complexity of space operations, the formation of large constellations may affect the long-term sustainability of space activities, and these play an important role in achieving the goal of sustainable development, from the perspective of current and future participants of this activity, in particular developing countries. Increasing the safety of space operations was considered an essential element of this concept.[6] It was emphasized that outer space "should remain an operationally stable and safe environment that is maintained for peaceful purposes and open for exploration, use and international cooperation by current and future generations".[7] The very concept of long-term sustainability of outer space activities was also defined as "the ability to maintain the conduct of space activities indefinitely into the future in a manner that realizes the objectives of equitable access to the benefits of the exploration and use of outer space for peaceful purposes, in order to meet the needs of the present generations while preserving the outer space environment for future generations".[8]

To clarify the objectives and scope of the adopted guidelines, reference was made to the Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space of 13 December 1963 and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer

[3] P. Martinez, *The UN COPUOS Guidelines for the Long-term Sustainability of Outer Space Activities*, 'Journal of Space Safety Engineering' 2021, No. 8, p. 99.

[4] UNGA, Guidelines for the Long-term Sustainability of Outer Space Activities: first set, Report of the Committee on the Peaceful Uses of Outer Space, Fifty-nine session, 8–17 June 2016, Vienna, Annex, UN Doc. A/71/20, 26.06.2016, pp. 56-67.

[5] UNGA, Guidelines for the Long-term Sustainability of Outer Space Activities: first set, Report of the Committee on the Peaceful Uses of Outer Space, Sixty-second session, 12–21 June 2019, Vienna, Annex II, UN Doc. A/74/20, 3.07.2019, pp. 54-69.

[6] *Ibid.*, p. 50, paras 1-3.

[7] *Ibid.*, p. 50, para. 4.

[8] *Ibid.*, p. 50, para. 5.

Space, including the Moon and Other Celestial Bodies of 27 January 1967, with a particular reference to Articles I and III.[9]

The content of the Guidelines is divided into four parts, namely, A. "Policy and regulatory framework for space activities", B. "Safety of space operations", C. "International cooperation, capacity-building and awareness", D. "Scientific and technical research and development".

II. THE ISSUE OF INTERNATIONAL RESPONSIBILITY OF STATES IN GUIDELINES FOR THE LONG–TERM SUSTAINABILITY OF OUTER SPACE ACTIVITIES

The issue of international responsibility of States is one of the key elements of the UN COPUOS Guidelines for the Long-term Sustainability of Outer Space Activities. The document deals with it in the first section relating to the policy and regulatory framework for space activities. It opens with a guideline entitled "Adopt, revise and amend, as necessary, national regulatory frameworks for outer space activities". It recalls the responsibility of the State as a launching State of a space object into outer space and the responsibility of the State as a subject of international law, which is responsible for the actions of non-governmental entities. It is emphasized that States, considering their international obligations, when adopting, revising, amending or implementing national regulatory frameworks should consider ensuring and strengthening in national law the long-term sustainability of space activities (Guideline A.1.1). In turn, States as entities bearing international responsibility for the space activities of non- governmental entities should "adopt, revise or amend regulatory frameworks to ensure the effective application of relevant, generally accepted international norms, standards and practices for the safe conduct of outer space activities" (Guideline A.1.2). The guidelines therefore remind States, as subjects of international law, of a fairly obvious and fundamental obligation resting on them, which is international responsibility for space activities. At the same time, they indicate the obligation's connection with long-term sustainability and safety of operations in space. In addition, the document refers to the Resolution adopted by the General Assembly on 11 December 2013 on recommendations on national legislation relevant to the peaceful exploration and use of outer space, the provisions of which should be considered by States when shaping national law. At the same time, it is recommended that States should consider not only the existing space projects and ongoing space activities,

[9] *Ibid*., p. 51, paras 5, 7 and 8. See the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of 27 January 1967 (UNTS 1967, vol. 610, No. 8843, p. 205).

but also the potential development of national space sector (Guideline A.1.3). It is further emphasized that when enacting new regulations or amending them, States should bear in mind the obligations arising from Article VI of the 1967 Outer Space Treaty, and as new regulations are developed, States should consider regulations that enhance the long-term sustainability of outer space activities. This is to be a new issue beside those traditionally included in national law, such as safety, liability, reliability and cost (Guideline A.1.4). It is indicated that while developing, revising or amending regulatory measures applicable to the long-term sustainability of outer space activities, countries should not only implement international obligations, including those arising from space treaties to which they are parties, but they should also implement space debris mitigation measures, such as the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space, and the guidance contained in the Safety Framework for Nuclear Power Source Applications in Outer Space and satisfy the intent of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space (Guideline A.2.1 and A.2.2, p. 2(b) and (e)). Guideline A.3 entitled "Supervise national space activities" states that States should ensure that entities subject to their jurisdiction and/or control should have the appropriate structures and procedures for planning and conducting space activities in a manner that supports the objective of enhancing the long-term sustainability of outer space activities, and have the means to comply with relevant national and international regulatory frameworks, requirements, policies and processes in this regard (Guideline A.3.1). Attention is also drawn to the responsibility for the authorization and continuing supervision of national activities. Therefore, it is up to the States to encourage each entity conducting space activities to establish and maintain all the necessary technical competencies required to conduct the outer space activities in a safe and responsible manner, and to develop specific requirements and procedures to address the safety and reliability of outer space activities, to assess all risks to the long-term sustainability of outer space activities associated with the space activities and to take steps to mitigate such risks to the feasible extent. It is also noted that States should enable compliance with relevant governmental and intergovernmental regulatory frameworks, requirements, policies and processes (Guideline A.3.2). It is also marked that the responsibility of the States to ensure that the management of an entity that conducts outer space activities establishes structures and procedures for planning and conducting space activities in a manner that supports the objective of promoting the long-term sustainability of outer space activities (Guideline A.3.4) and the assurance that appropriate communication and consultation mechanisms are in place within and among the competent bodies that oversee or conduct space activities (Guideline A.3.5).

Separate focus is given in the Guidelines to ensuing the equitable, rational and efficient use of the radio frequency spectrum and the various orbital regions used by satellites (Guideline A.4) and to enhancing the practice of registering space

objects (Guideline A.5). Guideline A.4 refers to the obligations arising for States from the Constitution and the Radio Regulations of the International Telecommunication Union. Among other things, attention is paid to not causing harmful interference with the reception and transmission of radio signals related to the space activities of other States and international intergovernmental organizations (Guideline A.4.3) and to removing spacecraft and launch vehicle orbital stages after completing the operational phase with orbits that pass through the low-Earth (LEO) and the geosynchronous Earth orbit (GEO) region (Guideline A.4.6). Referring to the obligations arising from Article VIII of the Outer Space Treaty and the 1975 Convention on Registration of Objects Launched into Outer Space, the Guidelines remind stakeholders to implement effective and comprehensive registration practices, noting that proper registration of space objects is of key importance for the safety and the long-term sustainability of space activities, and inadequate registration practices can have negative implications for ensuring the safety of space operations (Guideline A.5.1). Mention is made of the need to adopt appropriate national or other relevant policies and regulations to harmonize and sustain over the long term registration practices based on the widest possible international basis. It is emphasized that States should bear in mind the need to provide timely information that contributes to the long-term sustainability of outer space activities as well as information on space objects, their operation and their status (Guideline A.5.2). States should also request all necessary information from space launch service providers and users under their jurisdiction and/or control to meet all registration requirements under the Registration Convention (Guideline A.5.6). They also should consider providing information on any change of status in operations and, following the change in supervision of a space object in orbit, information about changes in the orbital position (Guideline A.5.7).

The subsequent parts of the Guidelines focus on desirable actions that should be taken by States to maintain availability of the environment for space operations and their safety. From a practical point of view, however, they contain important guidelines. Their application would not only ensure the safety of space operations and would limit the effects of space activities, which have been quite expansive so far, but it would also minimize the risk of State liability for space activities. Some of them are worth highlighting here. In particular, the Guidelines mention, among other things, the need to exchange information between States on space objects and actual or potential situations in near-Earth space (Guideline B.1.3), the implementation of a dedicated consultative process, preferably under the auspices of the Committee on the Peaceful Uses of Outer Space, taking into account the work of relevant technical bodies, in order to achieve harmonized and standardized record-keeping on space objects and events in outer space (Guideline B.1.4), the development of techniques and methods to improve the accuracy of orbital data for spaceflight security (Guideline B.2.1), making conjunction assessments during all orbital phases of controlled flight for their current and planned spacecraft

trajectories (Guideline B.4.1), and designing space objects in a way that limits the formation of space debris (Guideline B.8.2). The document also suggests ways to minimize space pollution, pointing to the need to look for new technologies to extend the operational lifetime, to prevent collisions and to implement advanced measures for spacecraft passivation and post-mission disposal and designs to enhance the disintegration of space systems during uncontrolled atmospheric re-entry (Guideline D 2.3).

As it is seen, on the one hand, the Guidelines try to remind States about their role in shaping responsibly conducted space activities, and on the other hand, this document is a kind of collection of "good advice and obligations". Its content is based on the conclusions drawn from the current practice of States. It refers to the developed treaty standards regarding the exploration and use of space and the soft law standards that supplement them.

III. IMPLEMENTATION OF THE ASSUMPTIONS OF THE LONG–TERM SUSTAINABILITY CONCEPT OF OUTER SPACE ACTIVITIES

The Guidelines for the Long-term Sustainability of Outer Space Activities as soft law standards are not a source of obligations for States. However, as the document itself emphasizes, "the existing United Nations treaties and principles on outer space provide the fundamental legal framework for the guidelines".[10] Thus, the COPUOS Guidelines are rooted in hard law, and their voluntary implementation means the implementation of legally binding standards. A more far-reaching conclusion could also be drawn, based on the interpretation of the 1967 Outer Space Treaty. Although the very concept of long-term sustainability of activities in outer space concerns essentially the preservation of the availability of the outer space environment for current and future space operations, it finds strong support in the regulations of the said Treaty. Although it does not speak about the interests of current and future generations, which is a characteristic element of the concept, it decides in Article I that the exploration and use of outer space and celestial bodies "shall be carried out for the benefit and in the interests of all countries (…) and shall be the province of all mankind". It is undoubtedly in the interest of States to maintain a stable space environment that guarantees the exploration and use of outer space. However, this thought cannot be closed only in the current perspective. Nothing would justify a logic which is fundamentally irrational. Moreover, the treaty-guaranteed right to explore and use outer space and celestial bodies is addressed to all States, whereby nothing would justify such activities by some of

[10] *Ibid*., p. 52, para. 14.

them which would limit or make it impossible for other States to exercise their rights. A similar argument has been used in the scientific literature to justify Article II's prohibition of appropriation of outer space and celestial bodies, linking it with Article I's right to use space by all States on an equal footing. As noted by Górbiel, the content of these regulations "imposes the conclusion that States may make use of the materials found in space – regardless of the form in which they occur – only in such a way that it will not infringe or limit analogous rights of other States".[11] It should be remembered that outer space is subject to the international law regime. Therefore, its exploration and use should be done for the benefit of all States, and should not restrict the rights of any State, as "the province of all mankind" recognized in the Outer Space Treaty, even if they do not currently have any space activities. On the contrary, every effort should be made to ensure that the activity of States in space does not prevent other States from developing their own space activities when they are ready. Otherwise, the allegation of violation of the provisions of the Outer Space Treaty would be justified, which could be the basis for the international responsibility of States. The implementation of the COPUOS Guidelines can protect States from such an effect. In addition, by creating an appropriate regulatory framework and adopting appropriate technical standards for the conduct of space activities, as recommended by the Guidelines, States protect themselves against international liability for damage caused as a result of activities conducted in outer space.

As may be seen, from the point of view of responsibility of States themselves, the Guidelines for the Long-term Sustainability of Outer Space Activities are a set of recommendations, the implementation of which would ensure compliance of space activities with the provisions of the Outer Space Treaty. British legislation may be an interesting and useful point of reference for regulatory actions taken by States. The UK is the undisputed leader when it comes to national regulations on space activities, where the issue of sustainable operations in space is treated as one of the principles of granting consent to conduct space activities. This is also related to the ambitions of this State. We can read on one of the government websites that the national space strategy is a plan that will allow the United Kingdom to take a leading role on the international stage.[12] Space sustainability and space security are elements of this strategy. It is emphasized that "the UK will work coherently across the UN Committee on the Peaceful Uses of Outer Space (…). The Government will meet the challenges of an increasingly contested and congested environment in space through targeted and robust diplomacy".[13]

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[11] See A. Górbiel, *Międzynarodowe prawo kosmiczne*, Warsaw 1985, p. 132.

[12] Policy Paper. National Space Strategy, 1 February 2022, https://www.gov.uk/government/publications/national-space-strategy/national-space-strategy (accessed 14.10.2022).

[13] HM Government, *National Space Strategy*, September 2021, p. 35, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1034313/national-space-strategy.pdf (accessed 14.10.2022).

It is worth noting that this country is building its space power through, among other things, modern regulations that meet COPUOS expectations. The Outer Space Act,[14] adopted in 1986, already in its original version stipulated that the licence to conduct space activities may include, in particular, the condition requiring the licensee to conduct his operations in such a way as to prevent the contamination of outer space and governing the disposal of the payload in outer space on the termination of operations under the licence and requiring the licensee to notify the Secretary of State as soon as practicable of its final disposal (Section 5.2(e)(i), 5.2(g)). The Act refers quite extensively to conditions for granting the licence and to issues related to its transfer, change, suspension and withdrawal. As a result of the introduced amendments, the application of the 1986 Act was limited to activities conducted abroad by British entities, while space activities conducted in or from the United Kingdom are currently regulated by the Space Industry Act 2018.[15] It sets high standards for commercial spaceflight operations.[16]

Speaking of State responsibility for space activities, it is worth noting that British law provides for licensing requirements for an orbital operator in relation to procuring the launch of a space object into orbit, operating a space object in orbit or conducting any other activity in outer space, also lunar activities. Similarly, a licence is required for both a launch operator (in relation to launching a launch vehicle, or a carrier aircraft and a launch vehicle) and a return operator (in relation to returning a launch vehicle, launched elsewhere than the UK, to land in the UK or UK territorial waters). The regulations also speak of a spaceport licence and a range controls licence.[17]

The UK licensing procedure is related to the Guidance for Orbital Operator Licence Applicants and Orbital Operator Licensees,[18] which apply to any person or organization wishing to conduct spaceflight activities from the UK. These guidelines identify four core principles to consider when evaluating applications for an orbital operator licence.[19] These are safety, security, sustainability, and responsi-

[14] The Outer Space Act 1986, https://www.legislation.gov.uk/ukpga/1986/38/contents/enacted (accessed 14.10.2022).

[15] The Space Industry Act 2018, https://www.legislation.gov.uk/ukpga/2018/5/contents (accessed 14.10.2022).

[16] *Spaceflight Legislation and Guidance. Learn About Legislation and Insurance Requirements for UK Spaceflight*, https://www.gov.uk/guidance/spaceflight-legislation-and-guidance (accessed 14.10.2022).

[17] J. Wheeler, *The Space Law Review: United Kingdom*, 'The Law Reviews', 9 December 2021, https://thelawreviews.co.uk/title/the-space-law-review/united-kingdom (accessed 14.10.2022).

[18] CAA, Guidance for Orbital Operator Licence Applicants and Orbital Operator Licensees, CAP 2210, 21 July 2021, https://publicapps.caa.co.uk/docs/33/Guidance%20for%20Orbital%20Operator%20licence%20applicants%20and%20Orbital%20Operator%20Licensees%20(CAP2210).pdf (accessed 14.10.2022).

[19] Potential operators, before they start applying for a licence, can use the so-called "Traffic Light System" to help decide whether to complete a licence application and prepare for application. It also allows for the assessment of the risk associated with the planned space activity based on the

bility (Section 5(5.1)). The document explains what is meant by each of them. The principle of safety requires the applicant to take all measures to ensure that risks to the health, safety and property of persons are as low as reasonably practical and that the level of those risks is acceptable (Section 5(5.5)). The security principle focuses on ensuring that activities licensed in orbit are secure, both to the operator and third parties by mitigating the likelihood and impact of malicious events that might occur as a direct or indirect result of a licensed activity. It requires demonstrating that the activity will not actively interfere with the activities of others in the peaceful exploration and use of outer space, and a potential operator has an appropriate security system to prevent loss of control over activities in orbit (Section 5(5.8-5.9)). As part of the sustainability principle, it is noted that "a sustainable activity (or mission) is one that meets the requirements of the present without compromising the ability of subsequent generations to embark on activities (or missions) to meet their own requirements in the future" (Section 5(5.10)). The applicant is to demonstrate how he will comply with orbital sustainability by demonstrating solutions aimed at collision prevention, on-orbit break-ups, either from collisions with other objects in orbit or fragmentation, limiting the number of objects released during normal operations and removing spacecraft and orbital stages that have reached the end of their operations from the most used, useful and densely populated orbital regions (Section 5(5.11)). Responsibility refers to, among other things, avoiding breaches of the UK's international obligations, including international registration and liability obligations (Section 5(5.13)). The annex to the Guidance includes a list of best practices that may be applicable to the operator in the management, design or operation of a spacecraft or mission. They refer to, for example, the IADC Space Debris Mitigation Guidelines, the COPUOS Space Debris Mitigation Guidelines and the European Code of Conduct for Space Debris Mitigation. It is also worth noting that the principles of safety, security, sustainability and responsibility, used in the procedure of applying for an orbital operator's licence, are workable for the assessment of the satellite's payloads that are planned to be launched from the UK, but not operated from the UK. This is provided by the separate Guidance for Launch Operator and Return Operator Licence Applicants and Licensees.[20]

An important element of the long-term sustainability concept of outer space activities is space debris mitigation. Therefore, the implementation of the COPUOS Guidelines also requires the implementation of guidance relevant in this

principles of safety, security and sustainable operation. CAA, *Applying for a Licence. Pre-Application Engagement and How to Apply for a Licence*, https://www.caa.co.uk/space/orbital-satellite-operator/applying-for-a-licence (accessed 17.10.2022).

[20] CAA, Guidance for Launch Operator and Return Operator Licence, CAP 2213, 29 July 2021, http://publicapps.caa.co.uk/docs/33/Guidance%20for%20launch%20operator%20and%20return%20operator%20licence%20applicants%20and%20licensees%20(CAP2213)%20(PR).pdf (accessed 17.10.2022).

area. A good example of such practice may be the solutions adopted by the US government. Developed in 1997 and finally approved in 2001, the United States Government Orbital Debris Mitigation Standard Practices provide technical guidance on the mitigation of space debris and form the basis for specific orbital debris mitigation requirements issued by individual US Government departments and agencies.[21] In 2019, the Standard Practices were amended.[22] The text of the document draws attention to the adopted limits that make it necessary to implement appropriate technologies, to modify engineering methods and to design spacecraft and missions in a way that reduces pollution of the space environment. They establish limits for the risk of accidental explosions (para. 2.1) and the probability of collision with large objects during orbital lifetime and collision with small debris during mission operations (paras. 3-1, 3-2).[23] The use of appropriate technology is enforced by the "liability of disposal" rule adopted in the Standard Practices, which assumes that the probability of successful post-mission disposal should be no less than 0.9 with a goal of 0.99 or better (para. 4-2). The document also defines the time limit for the satellites to stay in Earth's orbit after the end of the mission, recognizing that this period may not exceed twenty-five years (paras 1-1, 4-1 and 5-2). Regardless of this, activities to reduce this time are encouraged and the preferred disposal options for immediate removal of structures from Earth orbit are established.[24]

The gravity of the problem of space debris is undoubtedly evidenced by the decision of the Federal Communications Commission of 29 September 2022 to shorten the time for disposal of satellites placed in low-Earth orbit from twenty-five to five years.[25] This is an important step in shaping the right policy of States towards orbital resources and space debris that limits them, a policy that meets the assumptions of the concept of long-term sustainability of activities in

[21] UNOOSA, Compendium of space debris mitigation standards adopted by States and international organizations. National Mechanism – United States of America, p. 2, https://www.unoosa.org/documents/pdf/spacelaw/sd/United_States_of_America.pdf (accessed 17.10.2022).

[22] U.S. Government Orbital Debris Mitigation Standard Practices, November 2019 Update, https://orbitaldebris.jsc.nasa.gov/library/usg_orbital_debris_mitigation_standard_practices_november_2019.pdf (accessed 17.10.2022).

[23] Standard Practices accept an explosion probability limit of less than 0.001. In the case of collisions with large objects (size 10 cm and more), the probability is to be 0.001, and in the case of small objects 0.01.

[24] J.-C. Liou, *The 2019 U.S. Government Orbital Debris Mitigation Standard Practices*, 57th Session of the Scientific and Technical Subcommittee. Committee on the Peaceful Uses of Outer Space, United Nations, 3-14 February 2020, Vienna, p. 7, https://www.unoosa.org/documents/pdf/copuos/stsc/2020/tech-24E.pdf (accessed 17.10.2022). See para. 2 of the preamble to the US Government Orbital Debris Mitigation Standard Practices.

[25] Space Innovation IB Docket No. 22-271, Mitigation of Orbital Debris in the New Space Age, IB Docket No. 18-313, Report and Order, Appendix. Federal Communications Commission, 29 September 2022, https://www.fcc.gov/document/fcc-adopts-new-5-year-rule-deorbiting-satellites-0 (accessed 20.10.2022).

outer space. It means that the Commission's licensing is conditioned on a shorter time to remove the spacecraft from orbit after the work has been done. It is worth noting that in 2004 the Commission adopted space debris regulations[26] according to which an entity applying for a licence to launch a satellite into space must declare that it has assessed and limited the amount of debris released in a planned manner during normal operations, the probability of the satellite becoming a source of debris by collisions, the probability of accidental explosions during and after completion of the mission operations, and a statement detailing the post-mission disposal plans for the satellite as it enters its end-of-life stage.[27] In practice, the Commission has consistently applied the twenty-five-year rule, even though it was not specifically codified in the 2004 Regulations.[28] Following successful consultations on reducing the time to remove orbiting satellites, the Commission adopted a five-year standard for inclusion it into the rules and regulations contained in the Code of Federal Regulations. In the introduction to the document containing the changes, the reasons for the decision were explained, in which the importance of the problem of the growing number of space debris was highlighted. The Commission noted that at the end of 2021 there were 4,800,000 satellites in low-Earth orbit, the vast majority of which were commercial and launched within the last two years. Therefore, the likelihood of a collision increases, and with it the risk to the satellite industry, estimated by the Commission at $279 billion a year, and to related jobs.[29] Attention was also drawn to the benefits of using Earth orbits for each sector of the economy. It was explained that the five-year rule is to help stabilize the orbital debris environment, and the adopted regulation is to "ensure that the Commission's actions concerning radio communications, including US spacecraft licensing and granting access to the US market for non-US spacecraft, promote the sustainable use of outer space without creating undue regulatory obstacles to new satellite ventures". It was also indicated that "this action by the Commission furthers the public interest in preserving viable options for future satellites and systems and the many services that those systems provide to the public".[30]

The adopted solutions show the scale of the problem of maintaining the stability of outer space and access to it, and how comprehensive the regulatory solutions adopted at the national level should be. Rational arguments support the full implementation of the COPUOS Guidelines. The practice of countries in this area can be traced on the basis of the Report on LTS Guidelines National Implemen-

[26] Mitigation of Orbital Debris, IB Docket No. 02-54, Second Report and Order, 19 FCC Rcd 11567, 9 June 2004, https://www.fcc.gov/document/mitigration-orbital-debris (accessed 20.10.2022).

[27] Space Innovation IB Docket No. 22-271 …, *op. cit.*, p. 3, para. 6.

[28] *Ibid.*, p. 3, para. 7.

[29] *Ibid.*, pp. 1-2, paras 2 and 3.

[30] *Ibid.*, p. 2, para. 4.

tation prepared by the Space Generation Advisory Council at the 60th session of the Legal Subcommittee, which was held in 2021. It shows that States implement most extensively the guidelines related to the policy and regulatory framework for space activities. However, the degree of implementation does not exceed 90 percent. States realize it beyond regulation and basic legislation implementing treaty provisions.[31] Unfortunately, only half of the countries surveyed have also adopted appropriate regulations regarding space debris mitigation standards.[32] It is worth noting that the research referred to 20 major and developing spacefaring nations.[33]

IV. CONCLUSIONS

The development and adoption of guidelines promoting the concept of long-term sustainability of activities in outer space is undoubted evidence of the UN's commitment to the protection of the outer space orbital environment seen through the prism of the multidimensional benefits that humanity derives from space activities. A state that wants to conduct space activities responsibly, bearing in mind both its international obligations and the rational and safe use of outer space, should undoubtedly implement COPUOS recommendations. Even if the need to act in the interest of future generations and to reduce threats to space missions are not very convincing arguments, although they should be, it is still in the interest of States to avoid the risk of international liability for space activities. In addition, a State that wants to be perceived as a serious, and at the same time safe and attractive partner for international cooperation in the space sector, should adopt regulations that would consider the relevant standards for licensing space activities in the broadest possible way. These standards and their extent are determined by the Guidelines for the Long-term Sustainability of Outer Space Activities, and the solutions adopted by some States may constitute a good reference point for the national regulatory practice. The key issue is to create appropriate procedures for verifying capabilities of applicant entities which would ensure durability, stability and safety of subsequent space missions. On the part of the State, this would mean not only minimizing the risk of international liability for space activities, but also

[31] Report on LTS Guidelines National Implementation Prepared for the 60th Legal Subcommittee, UNCOPUOS, In support of the United Nations Programme on Space Applications, Space Generation Advisory Council 2021, pp. 9-10, https://www.unoosa.org/documents/pdf/copuos/lsc/2021/tech-7E.pdf (accessed 20.10.2022).

[32] *Ibid*., p. 14.

[33] These countries include Australia, Belgium, Belarus, Brazil, Canada, China, Finland, Germany, India, Japan, Kazakhstan, Luxembourg, New Zealand, RSA, Russia, Spain, Ukraine, the United Arab Emirates, the United Kingdom and the United States of America. *Ibid*., p. 5.

minimizing the risk of real financial losses and of the loss of benefits that outer space activities may bring.

REFERENCES

Górbiel A., *Międzynarodowe prawo kosmiczne*, Warsaw 1985

Liou J.-C., *The 2019 U.S. Government Orbital Debris Mitigation Standard Practices*, 57th Session of the Scientific and Technical Subcommittee. Committee on the Peaceful Uses of Outer Space, United Nations, 3-14 February 2020, Vienna, https://www.unoosa.org/documents/pdf/copuos/stsc/2020/tech-24E.pdf (accessed 17.10.2022)

Martinez P., *The UN COPUOS Guidelines for the Long-term Sustainability of Outer Space Activities*, 'Journal of Space Safety Engineering' 2021, No. 8

Wheeler J., *The Space Law Review: United Kingdom*, 'The Law Reviews', 9 December 2021, https://thelawreviews.co.uk/title/the-space-law-review/united-kingdom (accessed 14.10.2022)

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INTERNATIONAL SECURITY AND OUTER SPACE – TODAY'S LAW CHALLENGES

Abstract

Space security means safe and permanent access to space and limiting threats coming from there. This definition also includes the security aspects of man-made devices sent into space and of ground stations. Space infrastructure can be described as a network of space and ground systems connected by communication channels and allowing access to space. Today, the largest space powers have begun to consider space as an operational domain of warfare. Space more and more often appears to be a field for competition, which might become an arena of conflict.

The aim of this article is to present today's many law challenges to the security of space infrastructure, such as unintentional threats (space debris, geomagnetic and solar storms, and other random disturbances), intentional threats (ASAT anti-satellite weapons, malicious interference, and cyber-attacks), the growing problems of Earth orbit congestion, and the increasing amount of space debris from devices launched into space. The article also presents the role of international organizations (such as the UN Committee on the Peaceful Uses of Outer space) in making laws that are intended to observe and react to all changes necessary in the outer space environment and to be proactive to help outer space to be safe and secure for all mankind. The conclusion is, however, not optimistic. Space security is a sensitive issue, mainly during conflicts or wars. States are not inclined to bind themselves by international law in this matter. Thus, due to the absence of hard international law (treaties), bilateral and multilateral agreements as well as the best practices from countries that organize space flights must

apply. Space monitoring systems, such as the Situational Awareness System (SSA), the code of conduct in space, the UN Long Term Sustainability, or the space Traffic Management rules are legal tools to manage the above challenges in space today.

KEYWORDS

space security, Space Situational Awareness SSA, code of conduct in space, space traffic management, space debris

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bezpieczeństwo kosmiczne, świadomość sytuacyjna SSA, kodeks postępowania w kosmosie, zarządzanie ruchem kosmicznym, śmieci kosmiczne

1. INTRODUCTION

Space safety and security mean a secure, safe and sustainable access to space and mitigation of space hazards. This definition covers also aspects of safety and security of man-made equipment sent into space as well as ground stations. Space infrastructure can be described as a network of space and ground systems connected by means of communication channels and enabling access to space. Safety and security of space infrastructure involve numerous challenges, such as: unintended hazards (space debris, geomagnetic and solar storms and other accidental interferences), intended hazards (anti-satellite weapons – ASAT, malicious interferences and cyber-attacks) and increasing problems with Earth orbit congestion and growing quantities of space debris coming from equipment launched into space.

The aim of this article is to present the function of the Space Situational Awareness (SSA) programme as a tool that might play a significant role in space policies of countries. The creation of national or regional SSA systems should guarantee safety and security of people and infrastructure (in particular of satellites) from various threats both in space and on Earth. Therefore, establishment of permanent observation of space objects should be an essential component of a space policy (Space Surveillance and Tracking – SST). An SSA system should be, moreover, correctly implemented into the policy and law of individual countries.

Discussions about the term "Space Situational Awareness" were undertaken in the 1970s and it was defined as extensive knowledge about space objects and the ability to track, understand and predict their future location. The aim of this

programme is to protect space systems regarded as primary assets of a country's sustainable development. Destruction of even a part of space infrastructure might have serious consequences for the safety and security of citizens and the economic activity. The SSA system provides for combining all data acquired by various entities acting in space and on Earth for the purpose of creating a common database.

The creation of national or regional SSA systems should guarantee the safety of people and infrastructure (in particular satellites) in space and on Earth against various threats. Moreover, the SSA system should be properly implemented into the policies and laws of individual states. Increasingly, the SSA program is part of national space strategies, but so far there is no possibility of including it in international space law.[1] The only soft law regulations seem to be the LTS (Long Term Sustainability) and STM (space Traffic Management) rules discussed in international organizations and other international forums.

II. PROTECTION OF SPACE IN THE INTERNATIONAL ARENA

II.1. INITIATIVES ON THE UN FORUM CONCERNING SAFE AND SECURE ACTIVITY IN SPACE

The concept of space safety and security is an important matter of current discussions and debates on the forum of the UN and its specialised organisations. They concern both international security and disarmament and peaceful use of space; the latter has become a broadly employed notion, often without a uniform meaning. Indeed, no precise, generally accepted definition of space safety and security has been prepared to date.

A range of initiatives on various UN forums point to the growing pressures exerted by the international community in relation to all aspects of space, including safety and security and the enhancement of the multi-lateral system that regu-

[1] P. Zimmer, M. Ackermann, J.T. McGraw, *Telescopes and Optics for Space Surveillance (SSA)*, AMOS (Advanced Maui Optical and Space Surveillance Technologies Conference), 15–18 September 2020; M. Polkowska, *Prawo bezpieczeństwa w Kosmosie*, Warsaw 2018; B. Chanock, *The Problems and Potential Solutions Related to the Emergence of Space Weapons in the 21st Century*, 'Journal of Air Law and Commerce' 2013, Vol. 78(4), p. 691 ff.; J. Su, *Use of Outer Space for Peaceful Purposes: Non-Militarization, Non-Aggression and Prevention of Weaponization*, 'Journal of Space Law' 2010, Vol. 36, p. 253; P.K. Gleeson, *Perspectives on Space Operations*, 'AIJSPP' 2007, Vol. 5, pp. 145–172. ESPI Report 66, Security in Outer space: Perspectives on Transatlantic Relations, October 2018, https://espi.or.at/news/espi-public-report-66-security-in-outer-space-transatlantic-relations (accessed 20.09.2020); S. Moranta, *Security in Outer space: Perspectives on Transatlantic Relations*, 12th ESPI Autumn Conference, Vienna, 27 September 2018.

lates the use of space. At the same time, significant differences between countries emerge as regards priorities, methodologies, mechanisms and settings that serve to solve problems related to space safety and security, and the majority of initiatives transform into unending discussions. However, another challenge might be more disturbing: deadlocks in the work of one authority can be transferred to other forums, thus limiting progress even in those aspects in which there has been a consensus traditionally. The existing frictions between various UN bodies are also a factor that limits any activities, similarly to the many years long split between the civil and the military use of space.

This situation has somewhat improved recently. Diplomacy regarding space safety and security looks relatively promising: at least it is more effective than in previous years. Discussions about short- and long-term solutions will probably be still conducted in parallel. While discrepant priorities and perceptions of space safety and security have still been (and will be) present among the leading "space" countries, the existence of a political will that takes into account rather than eliminates these differences might be key in finding a common ground for future actions, which will be acceptable to various parties. Due to the nature of the hazards to the space infrastructure and services, the general perception of the threats might be the reason for countries to decide to collaborate and find a future consensus.[2] Such a consensus would be also of great importance to SDA and SSA programmes; it might be possible to reduce their interest in military objectives and increase the emphasis on civil matters, among others, observation of events in space and on Earth as well as actions for defence against space debris, meteorites and cyber-attacks.[3]

Interest in space activity on the part of the private sector was already observed in the early 1980s in certain Western countries, mainly in the USA. The rapid development of commercial activity in space began basically upon the change in the international political situation in the early 1990s when the Soviet Union ceased to be one of the two biggest powers (the Russian Federation formed on the major part of its territory). As a consequence, democratic countries, chiefly the United States, decided to admit private entities to space activity to a greater degree, as they were more resourceful and efficient than state-owned entities.[4] Shortly thereafter another step of this process took place, where the government and private companies purchased services from the private sector. This is a new

[2] M. Pellegrino, *Views on Space Security in the United Nations*, (in:) K.-U. Schrogl (ed.), *Handbook of Space Security. Policies, Applications and Programs*, Vol. 2, New York/Heidelberg/Dordrecht/London 2015, pp. 1555–1558.

[3] ESPI Report 71, Towards a European Approach to space Traffic Management, January 2020, pp. 10–11, www.espi.or.at (accessed 28.04.2021).

[4] D. Sagar, *Privatization of the Intergovernmental Satellite Organizations*, (in:) A. Kerrest (ed.), *Le droit de l'espace et la privatisation des activites spatiales*, Paris 2003, pp. 43–61; B.E. Bowen, *War in Space. Strategy, Space Power, Geopolitics*, Edinburgh 2020, p. 9.

business model and a new type of partnership. It helped create numerous innovative technologies and projects and the space industry became a significant source of GDP growth in certain countries.

The 21st century has brought plenty of remarkable achievements in the space management process. New technologies have been devised, the space industry has been commercialised, the number of countries pursuing an activity in space have increased, projects for utilisation of space resources have been launched, etc. The value of production and services generated by the global "space" economy in 2018 was estimated at approx. USD 360 billion.[5] However, the continual process of space commercialisation requires the existing legislation to be adapted to the current needs and challenges. Moreover, the political and economic competition exacerbated the conflicts between countries. In this situation, space safety and security covering two significant issues: secure, safe and sustainable access to space and mitigation of space hazards, have become more important.

Space applications, including remote sensing, signal intelligence, tele-communication and positioning/navigation, important for civil economies, have become key for military operations ever since the first Gulf War. The threats to space safety, security and infrastructure have multiplied, diversified and intensified over the past decade. Apart from safety and security issues related to the increasingly more congested space environment, space systems might also become targets of attacks aimed at physical damage to them, permanent destruction or temporary disruption of their capabilities or interception of confidential information. Not only military but also civil satellites are under this threat because boundaries between civil and military domains tend to blur: dual-use equipment has become widespread and military forces more and more often use commercial space services.

The threat of a space war is not realistic for the time being, but intensive armament processes in certain countries do not result in releasing the tensions in space and on Earth. It seems that the only solution here is patient diplomatic negotiations between the conflicted parties.

Given the absence of international laws, some countries regulate the issues related to the activity of private entities through internal legislation.[6] This gave rise to the idea of global cooperation between countries and private entities.[7]

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[5] G.S. Robinson, *Space Jurisdiction and the Need for a Transglobal Cybernation: the Underlying Biological Dictates of Humankind Dispersal, Migration and Settlement in Near and Seep Space*, 'Annals of Air Space Law' 2014, p. 325; R.S. Jakhu, *Introduction into the Conference*, 3rd Manfred Lachs International Conference on New Space Commercialization and the Law, 16–17 March 2015, Montreal, ICAO.

[6] R. Skaar, *Commercialization of Space and its Evolution, Will New Ways to Share Risks and Benefits Open Up a Much Larger Space Market?*, ESPI Report 4, May 2007, p. 5 ff.

[7] J. Monserrat Filho, *Why and How to Define "Global Public Interest"*, 'Proceedings of the Forty Third Colloquium on the Law of Outer Space', International Institute of Space Law of the International Astronautically Federation, 2–6 October 2000, Rio de Janeiro, Brazil, pp. 22–32.

A good example here is the regulations governing the activity of the International space Station (ISS).[8] Still, there are no sufficient legal solutions regulating, for example, operations of satellites. Means to facilitate satellite launches should be international standards independent of political circumstances and equal for all stakeholders, including private entities.[9]

Commercialisation of space activities is a natural result of the continuous development of space technology, but it leads to a range of legal issues which entail, among others, civil liability.[10] Some believe that this issue should be left to the market itself.[11] space transport services and telecommunication might require separate and specific international laws. Other authors argue that spaceflights may take advantage of the third and fourth freedoms of air (jointly), which were set already by the Chicago Convention[12] in 1944 and have applied to date in civil aviation. Transport of a satellite to Earth can be compared to cabotage (a satellite is deemed as a quasi-territory of a country).[13]

At present, private enterprises in certain countries are treated liberally: they only have to obtain a permit for pursuit of their activities in space from the country where they are registered. From the legal point of view, the technical and operational access to space is also free. Not all lawyers advocate excessive liberalisation of space activities, though; according to them an "international regulator" should take into account different opinions and requirements of countries, hence transport rights and an expansion of space activity cannot be identical for all countries.[14] Some authors point to the need to create a new branch of space law, i.e. law dealing with commercial activity in space.[15]

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[8] A. Farand, *Commercialization of International space Station Utilization: The European Partner's Viewpoint*, 'Air and Space Law' 2003, Vol. XXVIII(2), pp. 83–88.

[9] V. Leister, M.C. Frazier, *The Role of National and International Law in the Regulation of Space Activities*, 'Proceedings of the Forty Third Colloquium on the Law of Outer Space', International Institute of Space Law of the International Astronautically Federation, 2–6 October 2000, Rio de Janeiro, Brazil, pp. 164–167.

[10] H. Qizhi, *Certain Legal Aspects of Commercialization of Space Activities*, 'Annals of Air and Space Law' 1990, Vol. XV, pp. 333–342.

[11] P.D. Bostwick, *Liability of Aerospace Manufacturers: MacPherson v. Buick Sputters into the Space Age*, 'Journal of Space Law' 1994, Vol. 22(1-2), pp. 75–96. The author points to the growing number of court cases related to space equipment manufacturer's errors.

[12] Convention on International Civil Aviation, signed in Chicago on 7 December 1944, 15 UNTS 295.

[13] L. Ravillon, *Droits des contrasts spatiaux: quelques thèmes récurrents*, 'Revue Française de Droit Aérien' 1998, pp. 61–62. The author speaks of an evolution of the concluded space contracts due to the developing technology.

[14] H. Wassenbergh, *The Art of Regulating International Air and Space Transportation. An Exercise in Regulatory Approaches to Analyzing Air and Apace Transportation*, 'Annals of Air and Space Law' 1998, Vol. XXIII, pp. 201–229.

[15] P.A. Salin, *Orbites, fréquences et asteroïdes a l'heure de la commercialization des activités spatiales (vers une appropriation graduelle du patrimoine de l'espace?)*, 'Annals of Air and Space Law' 2001, Vol. XXVI, pp. 179–195.

As mentioned before, already in the 1980s the United States announced a space technology commercialisation programme, which included, among others, postulates for provision of convenient conditions for development of private enterprises and for support for their explorations and discoveries. Numerous US researchers are even convinced that private enterprises in the USA which pursue space activity should be permitted to circumvent certain legal regulations until they themselves create relevant laws concerning space operations.[16]

Nevertheless, jurisdiction issues remain a serious problem for private entities for the time being. The concept of responsibility for an activity that is in contravention to the rules of international law, including an activity of private entities, and responsibility of a country for damage inflicted by space objects, including by private operators, remains a fundamental problem of the international space law. Therefore, countries are forced to take internal measures to monitor and control the activity of private entrepreneurs.

Thus, controlling countries should have legislative mechanisms needed to determine the licensing and monitoring regime and a sanction system at their disposal. It seems that the international law should define the parameters and extent to which such control of private enterprises should be performed.[17]

As mentioned above, numerous countries have introduced their own regulations facilitating commercialisation, with the notable example of the United States (the first US law of 1984 was amended four years later).[18] Such kind of regulations should ensure safety and security, establish correct operational procedures, and facilitate acquiring outlet markets. It is important that relevant state authorities should be authorised for issuing commercial licences.

A rapid development of many private companies has been observable since the beginning of the 21st century thanks to the supportive attitude of certain countries (mainly the USA). New enterprises were founded (among others Nanoracks, Skybox and Made In space), while operations were commenced by new companies with older capital (Bigelow Aerospace, Blue Origin, spaceX or Virgin Galactic) and older companies making use of new technologies (Orbital Sciences, Boeing or Lockheed Martin). In addition, alliances were established between younger and older market players, such as Stratolaunch & Blue Origin and United

[16] A. Dula, *Authorization and Continuing Supervision of U.S. Commercial space Activities*, 'Air and Space Lawyer' 1984, Vol. 1(3), pp. 12–18; P.S. Dempsey, *The Evolution of U.S. Space Policy*, 'Annals of Air and Space Law' 2008, Vol. XXXIII, pp. 325–343; S. Trepczynski, *Benefits of Granting Immunity to Private Companies Involved in Commercial Space Ventures*, 'Annals of Air and Space Law' 2006, Vol. XXXI, p. 403.

[17] F.G. von der Dunk, *Public Space Law and Private Enterprise*, (in:) R.S. Jakhu (ed.), *Space Law – General Principles*, Montreal 2007, Vol. I, pp. 470–471.

[18] V.J. Vissepó, *Legal Aspects of Reusable Launch Vehicles*, 'Journal of Space Law' 2005, Vol. 31, pp. 165–217; Ch.W. Stotler, *International and U.S. National Laws Affecting Commercial Space Tourism: How ITAR Tips the Balance Struck Between International Law and the CSLAA (Commercial space Launch Amendment Act)*, 'Journal of Space Law' 2007, Vol. 33(1), p. 268.

Launch Alliance, or enterprises which do not deal with space equipment manufacturing on a daily basis.

Not every space activity is already regulated by national law. Even in the United States not all enterprises know which authority is responsible for issuing relevant permits for the operation of "space enterprises" and which one for the supervision over them.[19]

II.2 SPACE DEBRIS

Both SDA and SSA programmes have put an emphasis on solving the problem of space debris[20] created as a result of human activity in space. Several organisations, including OECD, and international committees, state administrations and space agencies have already conducted large-scale works related to the legal, technical and economic aspects of the problem of space debris and congestion in LEO. Insurance is also mentioned in this context.[21] Founded in 1993, the Inter-Agency space Debris Coordination Committee (IADC),[22] which affiliates many countries, including in particular China, is also heading in this direction. For the purpose of preventing and combating space debris, the IADC updates regulations in the form of recommendations for countries (IADC Space Debris Mitigation Guidelines) as soft law. The number of objects in space is still rising, thus this task seems impossible for the time being. The reason is people's carelessness; sometimes even carelessness of country leaders. The latest example here is the use of an ASAT by India in early 2019. Hopefully, the international community will not leave this act unpunished. National initiatives are one of the concepts of combat against space debris, apart from the activity of the IADC (guidelines). Space debris includes old, defunct satellites with various sizes and functions and parts thereof, which orbit and can re-enter Earth's atmosphere or pose a serious threat for operational satellites and other spaceships. Several failures of satellites have been caused by collisions with space debris. Commercial satellite operators and partners of the International Space Station had to repeatedly perform manoeuvres to avoid collisions with space debris over the past years.

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[19] M. Mineiro, *Regulatory Uncertainty for Non-Traditional Commercial Space Activities*, 3rd Manfred Lachs International Conference on New Space Commercialization and the Law, 16–17 March 2015, Montreal, ICAO.

[20] A. Koskina, *Artificial Intelligence and Space Situational Awareness: Data Processing and Sharing in Debris-Crowded Areas. ESA's Response*, 8th European Conference on Space Debris, 20 April 2021 (ESA/ESOC, 20-23 April 2021).

[21] M. Undseth, *The Economics of Space Debris in Perspective*, 8th European Conference on Space Debris, 23 April 2021 (ESA/ESOC, 20–23 April 2021).

[22] H. Krag, *The Space Debris Challenge, ESA's Response*, 8th European Conference on Space Debris, 20 April 2021 (ESA/ESOC, 20–23 April 2021).

When mentioning space pollution with space debris, problems related to its management and high costs are noticed. Therefore, it is proposed that low level forums and institutions be authorised to make decisions related to space debris elimination and to create a culture of cooperation based on trust and transparency. What is needed is inter-governmental discussions about global standards and amendments to treaties (e.g. as regards responsibility for debris left in space), public and private forums to facilitate the involvement of stakeholders (e.g. operators), preparation of standards on transparency and data exchange in SSA (e.g. with the use of artificial intelligence technologies) and enhancement of informal management tools, such as the establishment of ISO standards.[23]

II.3. PROPOSALS OF THE CODE OF CONDUCT IN SPACE

A code of conduct in space was initiated by the US Stimson Center. It was called "Rules of the Road" and concerned agreements on space operations on the international level. The key components of the code were: collision avoidance, prevention of creation of space debris, exchange of information and consultations concerning activities in space (for the purpose of reduction of amount of space debris) and allocation of space in orbits. The code was to be a voluntary, non-binding legal instrument. In addition, a code, as soft law, is easier to be agreed on, makes it possible to avoid lengthy discussions (e.g. about definitions) and constitutes an important signal for political processes, both home and abroad. There is risk, however, that such codes will be a distraction from efforts towards conclusion of international agreements.

December 2008, the Council of the EU officially presented a draft of its space code. As an international instrument, the code was intended to be binding on the countries which would become its members on a voluntary basis (except for norms that are uniform and customary – they are applied even by countries that are not signatories of the code). That act was to supposed to apply both to the military and the civil aspects of space operations; it was decided that it could bring practical benefits for safety and security in space and affect the operations performed there. The regulatory issues placed in the code, including defence issues, were an integral part of the European space policy, although the code did not grant the EU any particular role or responsibility. The code's objective was twofold. On the one hand, it helped reinforce the existing treaties, rules and other arrangements and it encouraged countries to join these initiatives and to implement their provisions into their legal order. On the other hand, the code supplemented UN treaties by

[23] D. Lambach, *Tackling the Space Debris Problem: A Global Commons Perspective* and N. Isnard, *Active Debris Removal: Mitigating Legal Barriers for Promising Technologies, Comparisons and Proposals* – presentations at the 8th European Conference on space Debris, 23 April 2021 (ESA/ESOC, 20–23 April 2021).

codifying good practices in the field of space operations, including notification and consultation. Despite these advantages, ultimately the idea of a code was not adopted by most countries.[24]

II.4. NEW GUIDELINES FOR CONDUCT IN SPACE (LTS)

Given the failure of the codes proposed by the Stimson Center and the EU, a similar initiative proposing the establishment of soft law was taken by the UN Committee on the Peaceful Uses of Outer space – UNCOPUOS. In June 2016, the Committee agreed on the first set of guidelines concerning long-term sustainability of outer space activities (A/71/20, Annex). In 2018, an agreement was reached regarding the preamble and nine additional guidelines (A/AC.105/1167, Annex III and A/73/20). However, the working group could not reach an agreement regarding its final report for a long time. On 21 June 2019, the preamble and 21 guidelines concerning "long-term sustainability of outer space activities" (LTS) were adopted during the 62nd UNCOPUOS[25] session. These documents contain programmes concerning the policy and regulatory framework for space activities. This is the outcome of over 8 years of work performed by the working group appointed by UNCOPUOS and supported by the United Nations Office for Outer Space Affairs (UNOOSA). The subject matter of their work concerned sustainable use of space. The Committee addressed countries and international organisations with an appeal to take relevant measures to implement the enacted guidelines.[26]

During said session, UNCOPUOS decided to establish, for the subsequent five years, a new working group to continue the work on the "long-term sustainability of outer space activities". The Committee decided that during the 57th session of the Scientific and Technical Subcommittee in 2020 the working group would agree on its own scope of authorisations, work methods and a special work plan towards:

a) specifying and analysing new challenges and considering possible new recommendations concerning "long-term sustainability of outer space activities";

b) exchanging the experiences, practices and conclusions drawn from the voluntary implementation of the adopted guidelines on the national level;

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[24] D. Oltrogge, *The Contributions of Commercial Best Practices to the Global Space Governance Continuum*, AMOS (Advanced Maui Optical and Space Surveillance Technologies Conference), 15–18 September 2020.

[25] The Committee on the Peaceful Uses of Outer space, http://www.unoosa.org/oosa/en/ourwork/copuos/index.html (accessed 28.04.2021).

[26] M. Polkowska, *Uchwalenie nowego kodeksu postępowania w Kosmosie; czy bliżej do opracowania projektu zarządzania ruchem kosmicznym?*, (in:) M. Polkowska (ed.), *Współczesne trendy w polityce bezpieczeństwa kosmicznego*, Warsaw 2020, pp. 49–66.

c) raising awareness and building potential, in particular among developing countries and those intending to commence activity in space.

Their 21 guidelines constitute the first tangible achievement of the Committee on the Peaceful Uses of Outer Space after 2007. Over the past 10 years, it has been possible to induce the majority of the member states not only to reach an agreement but also to continue further discussion on the implementation of the guidelines into the national legal systems of the member states.

Adoption of the guidelines, i.e. soft law, marks a huge success of the international community. The primary goal of the guidelines is to help countries and international organisations in their efforts towards mitigating the risk related to performance of space activities so that it is possible to maintain the present benefits and to tap future ones. The guidelines promote international cooperation in the area of peaceful use of and research on space.[27]

The long-term sustainability of outer space activities is defined as the ability to maintain the performance of activities there indefinitely in the future in a manner that accomplishes the objectives of fair access to the benefits of the exploration and use of space for peaceful purposes, for the purpose of meeting the needs of the present generations, at the same time preserving the space environment for future generations. This definition is consistent with the objectives of the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space of 13 December 1963 and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.[28]

Countries understand that the maintenance of exploration and use of outer space for peaceful purposes is a goal which must be pursued in the interest of all humankind.[29] Adoption of the guidelines, i.e. soft law, marks a huge success of the international community.[30] LTS is included in Appendix 1 to this publication.

[27] A/AC.105/L.318/Add.4, 19 June 2019; V.19-04973.

[28] Res. 2222 (XXI).

[29] During the AMOS (Advanced Maui Optical and Space Surveillance Technologies Conference), 15–18 September 2020, the participants of the panel discussion titled: SSA Policy Forum/ Evolution of Industry Best Practices for Space Sustainability, facilitated by I. Christensen from the Security World Foundation, were asked about the notion of sustainability. It was stated that there was still no single definition. As underlined by one of the participants, it is important to preserve the space for the future generations and remember about a balance between those who are using space now and those who will use space in near or distant future. It is difficult to measure the notion of sustainability, so behaviors of countries and their compliance with the requirements, e.g. for dealing with the issue of space debris, are analyzed. For this purpose, a space sustainability rating is created and behaviors of countries and their operators are examined. For more see D. Woods, *Leave no Traces, ESA's Response*, 8th European Conference on space Debris, 20 April 2021 (ESA/ ESOC, 20–23 April 2021).

[30] UNIS/OS/518, 22 June 2019.

II.5. ADOPTION OF UN RESOLUTIONS CONCERNING PREVENTION OF MILITARISATION OF SPACE

Another success was the adoption of three resolutions regarding militarisation of space during the session of the First Committee (Disarmament and International Security) of the UN General Assembly in November 2019. The first resolution titled: "No first placement of weapons in outer space" was adopted by a vote of 123 in favour to 14 against, with 40 abstentions. This resolution was prepared based on an amended draft, proposed in 2008 by Russia, China, Cuba, North Korea and Syria, regarding the "possibility of undertaking political commitments not to be the first to place weapons in outer space". At that time it was alleged that the resolution contained numerous gaps, including the lack of a clear definition of a space weapon; as a result this draft was rejected.

The second resolution, concerning the preparation of "Further practical measures for the prevention of an arms race in outer space", was adopted by a vote of 124 in favour to 41 against, with 10 abstentions. Essentially, this meant an approval for the works of the Group of Governmental Experts, in operation since 2018, tasked with preparing "elements of an international legally binding instrument preventing an arms race in outer space".

The third resolution titled "Transparency and confidence building measures in outer space activities" was adopted almost unanimously (166 votes in favour to 2 against, with 5 abstentions). This resolution was proposed by the Group of Governmental Experts already in 2013.[31]

III. SPACE TRAFFIC MANAGEMENT PROJECTS

Space Traffic Management (STM) is one of recurring concepts referring to actions in space. The highest priorities are the security and protection of space and of all operations performed there. It seems that due to the growing congestion of space there is an urgent need to regulate the rules of space navigation on the international, regional and national levels. No generally accepted definition of STM and no comprehensive and unified collection of Space Traffic Management regulations have been created so far. It is unclear how or based on what authorisations an entity (organisation) could manage traffic in space. Nevertheless, the STM concept has caught wide attention, above all due to the growing number of entities (both state and private) operating in space. Both LEO and GEO orbital systems involve a continuous collision risk. In order to mitigate this risk, satellite

[31] ESPI Yearbook 2019 – Space, Policies, Issues and Trends, May 2020, https://espi.or.at/?view=article&id=468:espi-yearbook-2019&catid=29 (accessed 23.04.2021).

operators that track space objects and their dynamics are required to stay alert at all times for the purpose of ensuring safe and effective use of space.[32]

Indeed, the STM concept is not new; the first mention about such a project regarding military aviation dates back to 1932. Later, this idea was revived in France, when its satellite was damaged by space debris. The tasks of STM include in particular orbit management and collision avoidance but solid studies are required in this regard because there are few publications concerning the civil application of STM. The military is the party that is most interested in this system now. For the time being, there are still more questions than answers regarding STM.[33]

Space flights include various stages (e.g. launch, orbiting and return). An STM system would cover them all. Such traffic should be organised and transparent for each operator. It must be remembered that spaceships cannot reach space and return to Earth without crossing the airspace, which is used by aircraft. Therefore, the Space Traffic Management system must not pose a threat to the safety and security of both aircraft and space objects. Moreover, there is a high risk of collision of active and defunct objects in Earth orbit.

The research on STM was reflected in, among others, the 2006 report titled "Cosmic Study on Space Traffic Management", which was prepared by the research group of the International Academy of Astronautics (IAA). Said report defines STM as: "the set of technical and regulatory provisions for promoting safe access into outer space, operations in outer space and return from outer space to Earth free from physical or radio-frequency interference". Another proposed definition of STM reads as follows: Space Traffic Management covers activities related to surveillance, coordination, regulation and promotion of activities (including space environment protection) during several separate mission stages, such as launch, space operations and return from space.[34]

As pointed by experts, data for STM must be appropriately gathered, processed, stored, managed, adjusted, used and disseminated. Particular caution must be exercised when issuing final messages and presumptions which are not confirmed by the gathered information must be avoided. Many observers are able to reconstruct events and trajectories but few can predict them because prediction requires knowledge and understanding of many variable data.[35]

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[32] D.L. Oltrogge, *The "We" Approach to Space Traffic Management*, Space Ops Conference 2018, https://arc.aiaa.org/doi/10.2514/6.2018-2668 (accessed 12.04.2021).

[33] AMOS (Advanced Maui Optical and Space Surveillance Technologies Conference), 15–18 September 2020, technical panel. Opening speech: Q. Verspieren, *Challenges and Opportunities in Developing Norms of Behavior.*

[34] M. Dickinson, *Future STM Capabilities*, ESPI Autumn Conference, 27–28 September 2018, www.espi.or.at (accessed 12.04.2021).

[35] M. Jah, *Space Object Behavior Quantification and Assessment for Space Security*, (in:) K.-U. Schrogl (ed.), *Handbook of Space Security. Policies, Applications and Programs*, Vol. 2, New York/Heidelberg/Dordrecht/London 2015, pp. 969–970.

Discussions on this topic mention three possible management regimes: high, medium and low. In the case of the high regime, a superior authority with a range of operational and penal authorisations (among others, prohibition to act in orbit and levying fines) must be established. The medium regime takes into account the national laws and standards, focuses on consensus and soft law. The low regime is based on the national law and its institutions. STM is supposed to be exclusively civil while SDA and, to a smaller extent, SSA – military in nature. A question arises whether operators will understand the requirements of both these domains and be able to act for the benefit of them both.[36]

IV. CONCLUDING REMARKS

The 21st century has been marked a tremendous acceleration of space activity performed by individual countries. In this situation, a potential sensitivity of space systems has become the primary problem and made governments reconsider their doctrines and adopt a more assertive attitude in this area. The largest space powers have begun to consider space as an operational domain of warfare, alongside land, air, and sea. Therefore, space more and more often appears to be a field for competition, which might become an arena of conflict. Many countries develop also their offensive and defensive capabilities as part of the space security and deterrence strategy.

Space-related capabilities and services have been of primary significance for supporting the armed forces as well as public utility enterprises and the industry, which underlie a major part of the global economy and technology. However, threats to these capabilities and services are disturbing. Protection of space systems (satellites and ground infrastructure), which provide users with capabilities and services, is a special sovereign obligation of individual countries. In fact, not only the operation of these systems but also the gathering/acquisition and dissemination of information about activities undertaken in space are sovereign in nature. As space has gained importance as a contentious field expanding the human activity, it is becoming an increasingly bigger problem regarding global security, safety, protection, and sustainable management. Bearing that in mind, a concept providing for the establishment of an SDA/SSA programme and common database emerged.

Due to the absence of hard international law, bilateral and multilateral agreements as well as the best practices from countries organising space flights must

[36] C. Newman, *Space Law and the Space Law Games: Legal Liability and Mapping the Future in Orbit*, workshop at the AMOS (Advanced Maui Optical and Space Surveillance Technologies Conference), 15–18 September 2020.

apply. The development of SSA systems across the world and the exchange of (mainly non-confidential) data do not encounter any political obstacles; however, not all countries support the principle of secure operation of enemy satellites. Hence the intensification of cyber-attacks, which cannot be fully prevented yet. The SDA/SSA systems are acceptable to all countries engaged in space activity and they could contribute to reducing tensions between countries. The preparation of an international space object catalogue will be an important element of actions for the peaceful use of space. Soft regulations such as: STM, IADC or LTS might create "traffic rules" for all space users. They may help states in providing safety and security of outer space.

REFERENCES

Bostwick P.D., *Liability of Aerospace Manufacturers: MacPherson v. Buick Sputters into the Space Age*, 'Journal of Space Law' 1994, Vol. 22(1-2)

Bowen B.E., *War in Space. Strategy, Space Power, Geopolitics*, Edinburgh 2020

Chanock B., *The Problems and Potential Solutions Related to the Emergence of Space Weapons in the 21st Century*, 'Journal of Air Law and Commerce' 2013, Vol. 78(4)

Dempsey P.S., *The Evolution of U.S. Space Policy*, 'Annals of Air and Space Law' 2008, Vol. XXXIII

Dickinson M., *Future STM Capabilities*, ESPI Autumn Conference, 27–28 September 2018, www.espi.or.at (accessed 12.04.2021)

Dula A., *Authorization and Continuing Supervision of U.S. Commercial space Activities*, 'Air and Space Lawyer' 1984, Vol. 1(3)

Dunk von der F.G., *Public Space Law and Private Enterprise*, (in:) R.S. Jakhu (ed.), *Space Law – General Principles*, Montreal 2007, Vol. I

Farand A., *Commercialization of International Space Station Utilization: The European Partner's Viewpoint*, 'Air and Space Law' 2003, Vol. XXVIII(2)

Gleeson P.K., *Perspectives on Space Operations*, 'AIJSPP' 2007, Vol. 5

Isnard N., *Active Debris Removal: Mitigating Legal Barriers for Promising Technologies, Comparisons and Proposals*, 8th European Conference on Space Debris, 23 April 2021 (ESA/ESOC, 20–23 April 2021).

Jah M., *Space Object Behavior Quantification and Assessment for Space Security*, (in:) K.-U. Schrogl (ed.), *Handbook of Space Security. Policies, Applications and Programs*, Vol. 2, New York/Heidelberg/Dordrecht/London 2015

Jakhu R.S., *Introduction into the Conference*, 3rd Manfred Lachs International Conference on New Space Commercialization and the Law, 16–17 March 2015, Montreal, ICAO

Koskina A., *Artificial Intelligence and Space Situational Awareness: Data Processing and Sharing in Debris-Crowded Areas. ESA's Response*, 8th European Conference on Space Debris, 20 April 2021 (ESA/ESOC, 20-23 April 2021)

Krag H., *The Space Debris Challenge, ESA's Response*, 8th European Conference on Space Debris, 20 April 2021 (ESA/ESOC, 20–23 April 2021)

Lambach D., *Tackling the Space Debris Problem: A Global Commons Perspective*, 8th European Conference on Space Debris, 23 April 2021 (ESA/ESOC, 20–23 April 2021).

Leister V., Frazier M.C., *The Role of National and International Law in the Regulation of Space Activities*, 'Proceedings of the Forty Third Colloquium on the Law of Outer Space', International Institute of Space Law of the International Astronautically Federation, 2–6 October 2000, Rio de Janeiro, Brazil

Mineiro M., *Regulatory Uncertainty for Non-Traditional Commercial Space Activities*, 3rd Manfred Lachs International Conference on New Space Commercialization and the Law, 16–17 March 2015, Montreal, ICAO

Monserrat Filho J., *Why and How to Define "Global Public Interest"*, 'Proceedings of the Forty Third Colloquium on the Law of Outer Space', International Institute of Space Law of the International Astronautically Federation, 2–6 October 2000, Rio de Janeiro, Brazil

Moranta S., *Security in Outer space: Perspectives on Transatlantic Relations*, 12th ESPI Autumn Conference Vienna, 27 September 2018

Newman C., *Space Law and the Space Law Games: Legal Liability and Mapping the Future in Orbit*, workshop at the AMOS (Advanced Maui Optical and Space Surveillance Technologies Conference), 15–18 September 2020.

Oltrogge D., *The Contributions of Commercial Best Practices to the Global Space Governance Continuum*, AMOS (Advanced Maui Optical and Space Surveillance Technologies Conference), 15–18 September 2020

Pellegrino M., *Views on Space Security in the United Nations*, (in:) K.-U. Schrogl (ed.), *Handbook of Space Security. Policies, Applications and Programs*, Vol. 2, New York/Heidelberg/Dordrecht/London 2015

Polkowska M., *Uchwalenie nowego kodeksu postępowania w Kosmosie; czy bliżej do opracowania projektu zarządzania ruchem kosmicznym?*, (in:) M. Polkowska (ed.), *Współczesne trendy w polityce bezpieczeństwa kosmicznego*, Warsaw 2020

Polkowska M., *Prawo bezpieczeństwa w Kosmosie*, Warsaw 2018

Qizhi H., *Certain Legal Aspects of Commercialization of Space Activities*, 'Annals of Air and Space Law' 1990, Vol. XV

Oltrogge D.L., *The "We" Approach to Space Traffic Management*, Space Ops Conference 2018, https://arc.aiaa.org/doi/10.2514/6.2018-2668 (accessed 12.04.2021)

Ravillon L., *Droits des contrasts spatiaux: quelques thèmes récurrents*, 'Revue Française de Droit Aérien' 1998

Robinson G.S., *Space Jurisdiction and the Need for a Transglobal Cybernation: the Underlying Biological Dictates of Humankind Dispersal, Migration and Settlement in Near and Seep Space*, 'Annals of Air Space Law' 2014

Sagar D., *Privatization of the Intergovernmental Satellite Organizations*, (in:) A. Kerrest (ed.), *Le droit de l'espace et la privatisation des activites spatiales*, Paris 2003

Salin P.A., *Orbites, fréquences et asteroïdes a l'heure de la commercialization des activités spatiales (vers une appropriation graduelle du patrimoine de l'espace?)*, 'Annals of Air and Space Law' 2001, Vol. XXVI

Skaar R., *Commercialization of Space and its Evolution, Will New Ways to Share Risks and Benefits Open Up a Much Larger Space Market?*, ESPI Report 4, May 2007

Stotler Ch.W., *International and U.S. National Laws Affecting Commercial Space Tourism: How ITAR Tips the Balance Struck Between International Law and the CSLAA (Commercial space Launch Amendment Act)*, 'Journal of Space Law' 2007, Vol. 33(1)

Su J., *Use of Outer Space for Peaceful Purposes: Non-Militarization, Non-Aggression and Prevention of Weaponization*, 'Journal of Space Law' 2010, Vol. 36

Trepczynski S., *Benefits of Granting Immunity to Private Companies Involved in Commercial Space Ventures*, 'Annals of Air and Space Law' 2006, Vol. XXXI

Undseth M., *The Economics of Space Debris in Perspective*, 8th European Conference on Space Debris, 23 April 2021 (ESA/ESOC, 20–23 April 2021)

Vissepó V.J., *Legal Aspects of Reusable Launch Vehicles*, 'Journal of Space Law' 2005, Vol. 31

Wassenbergh H., *The Art of Regulating International Air and Space Transportation. An Exercise in Regulatory Approaches to Analyzing Air and Apace Transportation*, 'Annals of Air and Space Law' 1998, Vol. XXIII

Zimmer P., Ackermann M., McGraw J.T., *Telescopes and Optics for Space Surveillance (SSA)*, AMOS (Advanced Maui Optical and Space Surveillance Technologies Conference), 15–18 September 2020

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WHY WAS IT NECESSARY TO APPOINT A DECENTRALIZED AGENCY FOR COHERENT AND SAFE MANAGEMENT OF THE EU SPACE PROGRAMME? COMMENTS ON THE EUSPA'S MANDATE AGAINST OTHER EU AGENCIES[1]

Abstract

The aim of this article is to answer the question of why it was necessary to appoint a specialised decentralised agency for coherent and safe management of the EU Space Programme. This article also analyses the Union's competences in the area of space policies and investigates the EUSPA's place in the EU administration system. Finally, the article investigates and presents selected competences of the European Union Agency for the Space Programme (EUSPA) for strengthening EU's security. This study employs the method of interpretation of the law in force, while EU regulations are subject to a teleological interpretation. The conducted analysis shows that the correctness of the choice of a decentralized agency as an entity responsible for implementing the EU space programme was determined by agencies' shared features – the fact that they are permanent organs, with legal personality and thus independent as they function outside the Commission's Directorates. Moreover, agencies affiliate apolitical experts and

[1] This article is an effect of the implementation of a research project "Ombudsman as a guarantor of protection of fundamental rights of migrants" no. 2020/39/B/HS5/01424 financed from the funds of the National Science Centre.

implement the priority of new public management based on the commercial companies managing model. Thus, the way they operate is more effective and predictable.

KEY WORDS

decentralised agencies, EU Space Programme, EUSPA, space law

SŁOWA KLUCZOWE

agencje zdecentralizowane, program kosmiczny UE, Agencja Unii Europejskiej ds. Programu Kosmicznego, prawo kosmiczne

1. INTRODUCTION

The European Union, previously the European Community (European Economic Community, EEC), was established to tighten economic cooperation between European countries. Initially, EEC activity focused on creating an internal market with the freedom of movement for workers, capital, goods and services. With time, when member states strengthened cooperation, we could observe a certain "sweeping in" of competences by the Community and the Union. The proof for it was the introduction of EU citizenship and the freedom of movement for the citizens of the Union thanks to the Maastricht Treaty or inclusion of the *acquis Schengen* to the legal system of the Union and creation of a common migration and asylum policy under the Treaty of Amsterdam. Inclusion of the right to exercise policies for space exploration in the EU competences was also a sign of the times.[2]

The aim of this article is to answer the question of why it was necessary to appoint a specialised decentralised agency for coherent and safe management of the EU Space Programme. This article also analyses the Union's competences in the area of space policies and investigates the EUSPA's place in the EU administration system. Finally, the article inspects and presents selected competences of the European Union Agency for the Space Programme (EUSPA) for strengthening EU's security.

[2] B. Smolik, P. Turczyński, *Geneza eksploracji kosmosu – rozważania wstępne*, (in:) B. Smolik, P. Turczyński (eds), *Polityka kosmiczna Unii Europejskiej. Zagadnienia prawne, polityczne i ekonomiczne*, Kraków 2022, pp. 11-12; P. Świerczyński, *Obszar "Przestrzeń kosmiczna" w programach ramowych Unii Europejskiej od 7PR do programu Horyzont Europa (2007-2021)*, (in:) B. Smolik, P. Turczyński (eds), *Polityka kosmiczna Unii Europejskiej. Zagadnienia prawne, polityczne i ekonomiczne*, Kraków 2022, p. 125 ff.

This study employs the method of interpretation of the law in force, while EU regulations are subject to a teleological interpretation.

2. THE EU SPACE PROGRAMME AND THE COMPETENCES AND GOALS OF THE EUROPEAN UNION

The European Union has competences under treaties to execute a policy for space exploration. Pursuant to Article 4 TFEU these are shared competences: "In the areas of research, technological development and space, the Union shall have competence to carry out activities, in particular to define and implement programmes; however, the exercise of that competence shall not result in Member States being prevented from exercising theirs".[3] Moreover, the Treaty regulates questions associated with the implementation of the Union's policy on cosmic space in Title XIX of the TFEU: "Research and technological development and space". Pursuant to Article 189 of the Treaty, the Union draws up its space policy and to this end it pursues its own initiatives and supports research and technological development. Under this article, the European Parliament and the Council are given competences to lay down secondary law.[4]

The basic act of secondary law for the implementation of the space policy is Regulation (EU) 2021/696 establishing the Union Space Programme and the European Union Agency for the Space Programme.[5]

It needs to be remembered that the European Union exercises its space policy competences according to the subsidiarity principle under Article 5 of the Treaty on European Union.[6] There is no doubt that activities in the area of space

[3] Treaty on the Functioning of the European Union, consolidated version, OJ C 202, 7.06.2016, p. 47. See also R. Schutze, *An Introduction to European Union Law*, Cambridge 2013, p. 59; N. Foster, *EU Law Directions*, Oxford 2012, p. 74; D. Chalmerd, G. Davies, G. Monti, *European Union Law*, Second Edition, Cambridge 2011, pp. 208-210.

[4] For the European Space Policy see B. Smolik, *Szanse i zagrożenia polityki kosmicznej Unii Europejskiej*, (in:) B. Smolik, P. Turczyński (eds), *Polityka kosmiczna Unii Europejskiej. Zagadnienia prawne, polityczne i ekonomiczne*, Kraków 2022, p. 16 ff.

[5] Regulation (EU) 2021/696 of the European Parliament and of the Council of 28 April 2021 establishing the Union Space Programme and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013 and (EU) No 377/2014 and Decision No 541/2014/EU, OJ L 170, 12.5.2021, pp. 69–148.

[6] Pursuant to Article 5(3) TEU: "Under the principle of subsidiarity, in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States, either at central level or at regional and local level, but can rather, by reason of the scale or effects of the proposed action, be better achieved at Union level." Treaty on European Union, consolidated version, OJ C 202, 7.06.2016, pp. 13-46.

policy cannot be exercised by individual Member States. The confirmation of the application of the subsidiarity principle was placed in the Preamble of Regulation 2021/696, in its recital 127.[7]

The Space Programme carried out by the European Union fits the goals generally pursued by the EU, such as development of the internal market (thanks to the possibilities of application of new technologies) and also strengthening competitiveness of the Union's economy on the global market and a better protection of consumers. On the other hand, the Space Programme allows the strengthening of EU activities for the benefit of the Union's external security, including protection against terrorism or ensuring security of the EU borders. Recital 62 of the Regulation emphasizes the use of satellite navigation systems and Earth observation systems by transport, telecommunications, agriculture and energy sectors.

The space policy accommodates most of all the following components: Galileo (a sat nav system),[8] Copernicus (Earth observation system),[9] GOVSATCOM (that ensures government satellite communications),[10] SSA (Space Situational Awareness; SST – Space Surveillance and Tracking – a system for tracking space debris, is one of its component)[11] and EGNOS (The European Geostationary Navigation Overlay Service, a system responsible for PGS security).[12]

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[7] Pursuant to Recital 127 of Regulation 2021/696: "Since the objective of this Regulation cannot be sufficiently achieved by the Member States, but can rather, by reason of the scale and effects of the action that go beyond the financial and technical capacities of any single Member State, be better achieved at Union level, the Union may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 TEU. In accordance with the principle of proportionality, as set out in that Article, this Regulation does not go beyond what is necessary in order to achieve that objective".

[8] Global Navigation Satellite System (GNSS). The Galileo System is EU's satellite navigation system for civilian purposes and thus ensures the Union's strategic autonomy. EUSPA, *Galileo is the European global satellite-based navigation system*, https://www.euspa.europa.eu/european-space/galileo/What-Galileo (accessed 18.08.2022). See also B. Smolik, *Unia Europejska w obliczu głównych wyzwań polityki kosmicznej*, 'Wrocławskie Studia Politologiczne' 2008, No. 9, p. 148; P. Świerczyński, 2022, *op. cit.,* p. 127 ff.

[9] Earth observation under Copernicus is carried out in six thematic areas: atmosphere, environment, sea, land, climate change, security and crisis situations – see R. Bielawski, *Budowanie zdolności kosmicznych w zakresie obserwacji Ziemi – stan obecny oraz perspektywy rozwojowe*, 'Ad Astra' 2022, No. 5, p. 23. See also A. Szwed, *Program obserwacji Ziemi Copernicus narzędziem rozwiązania kryzysu migracyjnego*, (in:) A. Gołębiowska, K. Myszona – Kostrzewa (eds), *Aktualne wyzwania prawa kosmicznego a bezpieczeństwo międzynarodowe*, Warsaw 2020, pp. 199 – 214.

[10] EUSPA, *Govstatcom*, https://www.euspa.europa.eu/european-space/govsatcom (accessed 10.01.2023).

[11] EUSPA, *Space Situational Awareness*, https://www.euspa.europa.eu/european-space/space-situational-awareness (accessed 10.01.2023).

[12] [12] See: B. Smolik, 2022, *op. cit.*, p. 29; M. Polkowska, *Współczesne trendy w polityce kosmicznej – rola Europy*, (in:) B. Smolik, P. Turczyński (eds), *Polityka kosmiczna Unii Europejskiej. Zagadnienia prawne, polityczne i ekonomiczne*, Kraków 2022, p. 114.

The functioning of the Space Programme is necessary for the development of the Union's economy, the single digital market, for ensuring its competitiveness and for safeguarding EU security and activities for the climate. The Space Programme is a response to the changing conditions of the development of the economy in the modern world and fits in the general goals of the Union as an international organization.

3. THE CHALLENGE FOR EFFECTIVE MANAGEMENT OF THE IMPLEMENTATION OF THE UNION'S SPECIALIZED POLICIES – CREATION OF DECENTRALIZED AGENCIES

The choice of the form of a decentralized agency for the body that manages the European space programme was not accidental.[13] Under administrative law of the European Union an agency may take the form of an executive agency (appointed by the European Commission for a fixed term to manage EU programmes) or a decentralized agency.[14]

The Union's law does not define the concept of agency,[15] but such definitions were developed by legal scholars.[16] Zieliński defines decentralised agencies as "permanent bodies acting on the basis of the EU law, created on the basis of secondary legislation of this organization and equipped with a separate legal personality".[17]

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[13] Decentralized agencies are part of the EU administration, so called direct administration. For the character of EU's administration see J. Superat, *Administracja w Unii Europejskiej – podziały i postacie*, 'Acta Universitatis Vratislaviensis. Przegląd Prawa i Administracji' 2015, p. 105 ff.

[14] M. Poboży, *Agencje zdecentralizowane i komitety komitologiczne w systemie instytucjonalnym Unii Europejskiej – problem legitymizacji władzy*, (in:) M. Witkowska, K.A. Wojtaszczyk (eds), *Agencje, komitety i inne jednostki organizacyjne w Unii Europejskiej*, Warsaw 2015, p. 156.

[15] M. Wieloński, *Prawny wymiar funkcjonowania agencji, komitetów i innych jednostek organizacyjnych Unii Europejskiej. Wnioski na przyszłość*, (in:) M. Witkowska, K.A. Wojtaszczyk (eds), *Agencje, komitety i inne jednostki organizacyjne w Unii Europejskiej*, Warsaw 2015, p. 33.

[16] See H. Lelieveldt, S. Princen, *The Politics of the European Union*, Cambridge 2019, p. 269.

[17] M. Zieliński, *Klasyfikacje agencji zdecentralizowanych Unii Europejskiej*, 'Studia Prawnicze KUL' 2017, No. 1(69), p. 182. Wojtaszczyk, on the other hand, defines agencies as special decentralized structures, usually created on the basis of secondary legislation, with a legal personality, that administer a diverse competence mandate for supporting the Union's bodies, member states and their citizens in the areas of selected fields of the Union policies – K. A. Wojtaszczyk, *Agencje w systemie Unii Europejskiej. Typologia oraz podstawy teoretyczno-metodologiczne prowadzenia badań*, (in:) M. Witkowska, K.A. Wojtaszczyk (eds), *Agencje, komitety i inne jednostki organizacyjne w Unii Europejskiej*, Warsaw 2015, p. 11. Witkowska, in turn, claims that "(...) the term agency should be understood as decentralized units that deal with a specific field of the EU policy identified in the instrument that sets it up (usually regulation).

From the historical point of view, commentators identify four generations of agencies – the first was created in the 1970s.[18] The 1990s was a special time in establishing these bodies – it is then that certain decentralized agencies were formed, such as the European Environment Agency and the so-called agencies of EU's former III pillar – e.g. Europol and Cepol. The aim of creating agencies was to take the burden off the European Commission and to set up the EU's expert administrative support.[19] The third generation of agencies was created at the beginning of the 21st century, while the fourth one after the 2009 financial crisis.[20] The emergence of EU agencies was associated with the phenomenon of progressive integration and inclusion in the EU's competences of spheres sensitive from the point of view of state policies.[21]

Agencies, as bodies of EU administration, are subject to the EU law, operate as a rule on the basis of the EU budget, while in certain cases they may issue administrative decisions.[22] The nature of their activity is permanent and they have seats in Member States. Agencies have management boards and executive directors in their structure and also auxiliary bodies (e.g. scientific committee),[23] while the Court of Auditors exercises external supervision over them.[24] EU law scholars and commentators call these agencies "independent" in a sense that they do not function under any Directorate of the European Commission, but have a legal personality.[25] Thanks to the introduction of such decentralization that grants legal personality and financial independence to agencies, it was possible for the Union to introduce activities in many specific fields,[26] such as aviation (European Union Aviation Safety Agency) or pharmaceutics (European Medicine Agency). At the

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They are autonomous towards EU institutions and have a legal personality" – see M. Witkowska, *Wymiar funkcjonalny działania agencji, komitetów i innych jednostek organizacyjnych w systemie Unii Europejskiej*, (in:) M. Witkowska, K.A. Wojtaszczyk (eds), *Agencje, komitety i inne jednostki organizacyjne w Unii Europejskiej*, Warsaw 2015, p. 82.

[18] Eurofund (European Foundation for the Improvement of Living and Working Conditions) is an example of such an agency – see M. Zieliński, 2017, *op. cit.*, p. 182.

[19] K. A. Wojtaszczyk, 2015, *op. cit.*, p. 12.

[20] For more see M. Zieliński, 2017, *op. cit.*, p. 187 – 188. Wieloński speaks critically of the diversity of structure, financing and lack of shared legal norms of EU agencies. He notes that "Agencies were set up one after another and there was no general vision of their role and place in the Union in the process. Modelling the legal system in this way results in multiple adverse phenomena" – M. Wieloński, 2015, *op. cit.,* pp. 48 – 49.

[21] M. Poboży, 2015, *op. cit.,* p. 135.

[22] M. Wieloński, 2015, *op. cit.*, p. 41.

[23] P. Wawrzyk, *Wymiar organizacyjny agencji Unii Europejskiej.Struktury organizacyjne; procesy decyzyjne; finansowanie. Wnioski na przyszłość*, (in:) M. Witkowska, K.A. Wojtaszczyk (eds), *Agencje, komitety i inne jednostki organizacyjne w Unii Europejskiej*, Warsaw 2015, p. 66.

[24] K.A. Wojtaszczyk, 2015, *op. cit.,* p. 15.

[25] M. Shapiro, *Independent Agencies*, (in:) P. Craig, G. de Burca (eds), *The Evolution of EU Law*, Oxford 2011, p. 111.

[26] K. Kowalczyk–Bańczyk, *Instytucje Unii Europejskiej*, (in:) S. Biernat (ed.), *Podstawy i źródła prawa Unii Europejskiej*, Warsaw 2020, p. 460.

moment there are close to 40 decentralized agencies in the system of the EU's administrative law, affiliated in the EU Agencies Network.[27]

The legal basis for the creation of agencies lies in provisions of primary legislation and in EU principles of democracy and institutional balance.[28] Agencies are mostly set up pursuant under Article 352 TFEU. According to it: "If action by the Union should prove necessary, within the framework of the policies defined in the Treaties, to attain one of the objectives set out in the Treaties, and the Treaties have not provided the necessary powers, the Council, acting unanimously on a proposal from the Commission and after obtaining the consent of the European Parliament, shall adopt the appropriate measures."[29]

Legal commentary emphasizes the special role of decentralized agencies in promoting new public management[30] and in promoting good governance standards.[31] It is an element of the so-called multi-level governance.[32] Agencies' features that determine these positive aspects include decentralization, independence and affiliation of apolitical experts. Representatives of legal scholarship believe that the model of managing an agency is similar to managing a commercial company and encourages transparency of public policy.[33] Agencies plan their actions in the context of results that are to be obtained by preparing long-term strategies and action plans.[34]

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[27] See also: *2021-2027 Multiannual Strategy for the EU Agencies Network*, Brussels 2020; the document and list of agencies available at: EU Agencies Network, https://euagencies.eu/ (accessed 11.01.2023).

[28] M. Wieloński, 2015, *op. cit*., p. 16.

[29] Article 352(1) sentence 1 TFEU. Moreover, the basis for creating decentralised agencies was Article 114 TFEU concerning harmonization of legislations – see M. Zieliński, 2017, *op. cit*., p. 194.

[30] As noted by M. Witkowska: "This pursuit assumes a move away from a bureaucratic style of decision-making (that is the administration process) towards the so-called managerial model (management process), oriented on the achievement of specific goals and implementation of specific tasks, the verification of which should take place on the basis of measurable standards or indicators. In this sense, the entities examined are appointed for specific purposes to increase the level of competence and efficiency of EU actions – M. Witkowska, 2015, *op. cit*., p. 85.

[31] A. Nowicka, *Metoda zarządzania przez rezultaty w agencjach Unii Europejskiej jako sposób efektywnego zarządzania publicznego*, (in:) M. Sadowski, P. Szymaniec (eds), *Acta Erasmiana IV. Prace z teorii i historii prawa oraz administracji publicznej*, Wrocław 2012, p. 124.

[32] M. Niedźwiedź, *Karta Praw Podstawowych a koncepcja "nowego rządzenia" w Unii Europejskiej*, (in:) A. Wróbel (ed.), *Karta Praw Podstawowych w europejskim i krajowym porządku prawnym*, Warsaw 2009, p. 66.

[33] A. Nowicka, 2012, *op.cit*., p. 124; as quoted in T.G. Grosse, *Nowe metody zarządzania publicznego w Unii Europejskiej*, (in:) J. Czaputowicz (ed.), *Administracja publiczna. Wyzwania w dobie integracji europejskiej*, Warsaw 2008, p. 82.

[34] *Ibid*., p. 130.

4. SPECIAL FEATURES OF THE EUSPA MANDATE

The features of a decentralized agency as a public administration body analysed above demonstrate that it was a form ideally suited to entrusting the management of the space programme to a specialized agency. This task required, on the one hand, a guarantee of a high expert level and on the other, dynamic management.

The European Union Agency for the Space Programme was set up under Regulation 2021/696. The European GNSS Supervisory Authority was originally the administrative body responsible for managing the Galileo programme.[35] It was then transformed into GSA – European GNSS Agency.[36] GSA was an agency responsible for operational activity.[37] Legal scholars classify GSA and a third-generation agency.[38]

EUSPA is a decentralized operational agency – it has a legal personality, it is a permanent body (with a seat in Prague, the Czech Republic), which carries out public tasks and was created on the basis of secondary legislation. Therefore, it meets the requirements to be qualified as an EU decentralized agency. EUSPA may also be classified indirectly as an internal market agency through the impact of its activities on the development of the digital market.

The Agency's mandate was established by Article 29 of Regulation 2021/696.[39] Even though the Space Programme covers the years 2021-2027, pursuant to recital 129 of the Regulation's preamble, the Agency also carries out its own tasks, is not subject to the time limitation of the programme and is a permanent body. The Agency's own tasks are listed in Article 29(1) of the Regulation – they include most of all: ensuring accreditation of security of all components of the space

[35] Established pursuant to Council Regulation (EC) No 1321/2004 of 12 July 2004 on the establishment of structures for the management of the European satellite radio-navigation programmes, OJ L 246, 20.7.2004, pp. 1–9. Changes in the mandate were introduced pursuant to Council Regulation (EC) No 1942/2006 of 12 December 2006 amending Regulation (EC) No 1321/2004 on the establishment of structures for the management of the European satellite radio-navigation programmes, OJ L 367, 22.12.2006, pp. 18–20.

[36] Regulation (EU) No 912/2010 of the European Parliament and of the Council of 22 September 2010 setting up the European GNSS Agency, repealing Council Regulation (EC) No 1321/2004 on the establishment of structures for the management of the European satellite radio navigation programmes and amending Regulation (EC) No 683/2008 of the European Parliament and of the Council, OJ L 276, 20.10.2010, pp. 11–21.

[37] M. Wieloński, 2015, *op. cit*., p. 43.

[38] M. Zieliński, 2017, *op. cit*., p. 186.

[39] Pursuant to Recital 45 of Regulation 2021/696, the Agency's aim is to carry out the space Programme. Moreover: "In relation to security in particular, and given its experience in this area, the Agency should be responsible for the security accreditation tasks for all the Union actions in the space sector".

Programme (including also carrying out of a risk analysis),[40] development of the market and promotion of services offered by Galileo, EGNOS and Copernicus, and also ensuring professional knowledge in terms of European Commission's space research. The Commission also vested special tasks in the Agency, such as for example managing the operation of the Galileo and Egnos programmes.[41]

The bodies of the Agency are the Administrative Board and the Executive Director – typical organs for an internal structure of EU decentralized agencies. At the level of the Agency's functioning, its impartiality and neutrality is indeed guaranteed by the composition of the Administrative Board[42], which in turn appoints the Executive Director.

A specific organ called the Security Accreditation Board also operates in the EUSPA's structures. The Board's tasks are listed in Article 38(2) and thus its main competence is to define and approve a security accreditation strategy for components of the EU's Space Programme. Moreover, the Security Accreditation Board acts as an advisory body for the Commission, analyses and confirms risk assessment and controls the implementation of security measures towards the space programme components.

Pursuant to Article 39 of the Regulation, the Security Accreditation Board is composed of a representative of each Member State, a representative of the Commission and a representative of the Union's High Representative for foreign affairs and security policy. Decisions of the Board are, pursuant to Article 41 of the Regulation, directed to the European Commission. Article 42 of the Regulation also ensures information exchange between the Board and Member States regarding security accreditation.

The Agency, owing to its competences to manage components of the Space Programme, is also responsible for implementing specific tasks. It is worth mentioning here, for example, the linking of EUSPA activities for EU security with the subject matter of effective protection of the Union's borders and management of migration movements. For example, the EUROSUR (European Border Surveillance System) set up in 2013 relies on data from the Copernicus system.[43]

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[40] Article 34(3) of Regulation 2021/696.

[41] Full list of tasks vested in the Agency by the Commission is included in Article 34(2) of Regulation 2021/696.

[42] According to Article 73(1) of Regulation 2021/696: "The Administrative Board shall be composed of one representative from each Member State, and three representatives of the Commission, all with voting rights. The Administrative Board shall also include one member designated by the European Parliament, with no voting rights".

[43] See Report from the Commission to the European Parliament and the Council on the evaluation of the European Border Surveillance System (EUROSUR). A contribution from the European Commission to the Leaders' meeting in Salzburg on 19-20 September 2018, Brussels, 12.9.2018 COM(2018) 632 final. The report concludes that: "the EUROSUR Fusion Services are the result of the daily cooperation of the Agency with the European Maritime Safety Agency (EMSA), the European Fisheries Control Agency 5 (EFCA) and the EU Satellite Centre and they have been

According to Article 51(1)(c) Regulation 2021/696: "Eligible actions under the Copernicus Services shall include: (...) "security service to support surveillance within the Union and at its external borders (...)".

The EUSPA is currently implementing a project *Integrated holographic management map for safety and crisis events (Overwatch)*, which, using data from the Copernicus system, allows creation of a natural disaster management system,[44] which in consequence will strengthen climate protection actions and facilitate rescue operations in the case of forced climate migrations. Rescue operations for victims of natural disasters, and also *man – made disasters* are supported by the EUSPA's project *MOBNET (MOBile NETwork for people's location in natural and man-made disasters).*[45]

In turn, pursuant to recital 100 of the preamble of the Regulation, the analysis of the use of GOVSATCOM covers the area of humanitarian crises, maritime emergencies and border surveillance.

The Galileo navigation system also provides an "invaluable asset for coast-guards and border control authorities, ensuring faster rescue operations and the saving of more lives".[46] At the moment the EUSPA is implementing a project dedicated to maritime security – *Galileo Advanced features for Maritime domain Breakthrough Applications for Safety and Security (GAMBAS)*,[47] under which the possibilities to use the Galileo system in preventing maritime disasters are analysed.

5. CONCLUSIONS

The aim of the analysis carried out here was to answer the question of why it was necessary to appoint a specialised decentralised agency for coherent and safe management of the EU Space Programme.

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expanded with the financial support of the EU Space Programme COPERNICUS. A new service called Multipurpose Aerial Surveillance (M.A.S.) is currently being tested in the framework of the European Cooperation on Coast Guard Functions and of the tripartite working arrangement between EMSA, EFCA, and the Agency".

[44] EUSPA, *Overwatch. Integrateg holographic management map for safety and crisis events*, https://www.euspa.europa.eu/integrated-holographic-management-map-safety-and-crisis-events (accessed 18.08.2022).

[45] EUSPA, *MOBile NETwork for people's location in natural and man-made disasters*, https://www.euspa.europa.eu/mobile-network-peoples-location-natural-and-man-made-disasters (accessed 18.08.2022).

[46] EUSPA, *Benefits*, https://www.euspa.europa.eu/european-space/galileo/benefits (accessed 12.02.2023).

[47] EUSPA, *Galileo Advanced Features for Maritime Domain Breakthrough Applications for Safety and Security*, https://www.euspa.europa.eu/galileo-advanced-features-maritime-domain-breakthrough-applications-safety-and-security (accessed 12.02.2023).

First, it needs to be emphasized that the Union holds shared competences to carry out space research and these competences are guaranteed under treaties. However, these competences are so specialised that it would be difficult to vest their implementation in the European Commission itself through one of the Directorates.

Agencies, as a form of administrative action, have been present in the administrative structure of the Union for a long time now and achieved great success in terms of development in the 1990s – thus the choice of the form of an agency to implement highly-specialised union policies is somewhat obvious. The eu-LISA, that is the European Union Agency for the Operational Management of Large-Scale IT Systems in the Area of Freedom, Security and Justice, may act as an example of such a choice, next to the EUSPA discussed here.

The correctness of the choice of a decentralized agency as an entity responsible for implementing the EU space programme was also determined by agencies' shared features – the fact that they are permanent organs, with legal personality and thus independent as they function outside the Commission's Directorates. Moreover, agencies affiliate apolitical experts and implement the priority of new public management based on the commercial companies managing model. Thus, their manner of operation is more effective and predictable.

Running an effective space policy at the level of the European Union requires an expert panel on the one hand and safeguarding of the security of the programme on the other, which is the responsibility of the Security Accreditation Board. Moreover, it is necessary to ensure information flow and permanent cooperation between Member States. The organizational structure of an agency, here of the EUSPA, guarantees that these requirements are met.

Finally, it is worth emphasizing that the EUSPA's actions are an argument supporting the validity of breaking the Meroni doctrine, pursuant to which the possibility to delegate administrative functions to agencies not listed in the Treaty was, in the opinion of the Court of Justice, limited.[48]

REFERENCES

Bielawski R., *Budowanie zdolności kosmicznych w zakresie obserwacji Ziemi – stan obecny oraz perspektywy rozwojowe*, 'Ad Astra' 2022, No. 5

EUSPA, *Galileo Advanced Features for Maritime Domain Breakthrough Applications for Safety and Security,* https://www.euspa.europa.eu/galileo-advanced-features-maritime-domain-breakthrough-applications-safety-and-security (accessed 12.02.2023)

[48] Judgment of the Court of 13 June 1958 in Meroni & Co., Industrie Metallurgiche, SpA v High Authority of the European Coal and Steel Community. Case 9-56, ECLI:EU:C:1958:7. See H. Lelieveldt, S. Princen, 2019, *op. cit.*, p. 271.

EUSPA, *Govstatcom*, https://www.euspa.europa.eu/european-space/govsatcom (accessed 10.01.2023)

EUSPA, *MOBile NETwork for people's location in natural and man-made disasters*, https://www.euspa.europa.eu/mobile-network-peoples-location-natural-and-man-made-disasters (accessed 18.08.2022)

EUSPA, *Overwatch. Integrated holographic management map for safety and crisis events*, https://www.euspa.europa.eu/integrated-holographic-management-map-safety-and-crisis-events (accessed 18.08.2022)

EUSPA, *Space Situational Awareness*, https://www.euspa.europa.eu/european-space/space-situational-awareness (accessed 10.01.2023)

Grosse T.G., *Nowe metody zarządzania publicznego w Unii Europejskiej*, (in:) J. Czaputowicz (ed.), *Administracja publiczna. Wyzwania w dobie integracji europejskiej*, Warsaw 2008

Kowalczyk – Bańczyk K., *Instytucje Unii Europejskiej*, (in:) S. Biernat (ed.), *Podstawy i źródła prawa Unii Europejskiej*, Warsaw 2020

Lelieveldt H., Princen S., *The Politics of the European Union*, Cambridge 2019

Niedźwiedź M., *Karta Praw Podstawowych a koncepcja 'nowego rządzenia' w Unii Europejskiej*, (in:) A. Wróbel (ed.), *Karta Praw Podstawowych w europejskim i krajowym porządku prawnym*, Warsaw 2009

Nowicka A., *Metoda zarządzania przez rezultaty w agencjach Unii Europejskiej jako sposób efektywnego zarządzania publicznego*, (in:) M. Sadowski, P. Szymaniec (eds), *Acta Erasmiana IV. Prace z teorii i historii prawa oraz administracji publicznej*, Wrocław 2012

Poboży M., *Agencje zdecentralizowane i komitety komitologiczne w systemie instytucjonalnym Unii Europejskiej – problem legitymizacji władzy*, (in:) M. Witkowska, K.A. Wojtaszczyk (eds), *Agencje, komitety i inne jednostki organizacyjne w Unii Europejskiej*, Warsaw 2015

Polkowska M., *Współczesne trendy w polityce kosmicznej – rola Europy*, (in:) B. Smolik, P. Turczyński (eds), *Polityka kosmiczna Unii Europejskiej. Zagadnienia prawne, polityczne i ekonomiczne*, Kraków 2022

Shapiro M., *Independent Agencies*, (in:) P. Craig, G. de Burca (eds), *The Evolution of EU Law*, Oxford 2011

Smolik B., *Unia Europejska w obliczu głównych wyzwań polityki kosmicznej*, 'Wrocławskie Studia Politologiczne' 2008, No. 9

Smolik B., *Szanse i zagrożenia polityki kosmicznej Unii Europejskiej*, (in:) B. Smolik, P. Turczyński (eds), *Polityka kosmiczna Unii Europejskiej. Zagadnienia prawne, polityczne i ekonomiczne*, Kraków 2022

Smolik B., Turczyński P., *Geneza eksploracji kosmosu – rozważania wstępne*, (in:) B. Smolik, P. Turczyński (eds), *Polityka kosmiczna Unii Europejskiej. Zagadnienia prawne, polityczne i ekonomiczne*, Kraków 2022

Superat J., *Administracja w Unii Europejskiej – podziały i postacie*, 'Acta Universitatis Vratislaviensis. Przegląd Prawa i Administracji' 2015

Szwed A., *Program obserwacji Ziemi Copernicus narzędziem rozwiązania kryzysu migracyjnego*, (in:) A. Gołębiowska, K. Myszona – Kostrzewa (eds), *Aktualne wyzwania prawa kosmicznego a bezpieczeństwo międzynarodowe*, Warsaw 2020

Świerczyński P., *Obszar 'Przestrzeń kosmiczna' w programach ramowych Unii Europejskiej od 7PR do programu Horyzont Europa (2007-2021)*, (in:) B. Smolik, P. Turczyński (eds), *Polityka kosmiczna Unii Europejskiej. Zagadnienia prawne, polityczne i ekonomiczne*, Kraków 2022

Wawrzyk P., *Wymiar organizacyjny agencji Unii Europejskiej.Struktury organizacyjne; procesy decyzyjne; finansowanie. Wnioski na przyszłość*, (in:) M. Witkowska, K.A. Wojtaszczyk (eds), *Agencje, komitety i inne jednostki organizacyjne w Unii Europejskiej*, Warsaw 2015

Wieloński M., *Prawny wymiar funkcjonowania agencji, komitetów i innych jednostek organizacyjnych Unii Europejskiej. Wnioski na przyszłość*, (in:) M. Witkowska, K.A. Wojtaszczyk (eds), *Agencje, komitety i inne jednostki organizacyjne w Unii Europejskiej*, Warsaw 2015

Witkowska M., *Wymiar funkcjonalny działania agencji, komitetów i innych jednostek organizacyjnych w systemie Unii Europejskiej*, (in:) M. Witkowska, K.A. Wojtaszczyk (eds), *Agencje, komitety i inne jednostki organizacyjne w Unii Europejskiej*, Warsaw 2015

Wojtaszczyk K.A., *Agencje w systemie Unii Europejskiej. Typologia oraz podstawy teoretyczno – metodologiczne prowadzenia badań*, (in:) M. Witkowska, K.A. Wojtaszczyk (eds), *Agencje, komitety i inne jednostki organizacyjne w Unii Europejskiej*, Warsaw 2015

Zieliński M., *Klasyfikacje agencji zdecentralizowanych Unii Europejskiej*, 'Studia Prawnicze KUL' 2017, No. 1(69)

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EU SANCTIONS IN THE AVIATION AND SPACE SECTORS ADOPTED FOLLOWING RUSSIA'S AGGRESSION AGAINST UKRAINE

Abstract

Russia's aggression against Ukraine stopped many joint scientific space exploration missions and launches of commercial satellites, and resulted in the imposition of economic sanctions that inevitably restrict a number of projects in space. Sanctions have been used by the UN from the 1960s and have grown to be an instrument applied by the international community and individual states to bring about a change in a state's or individual's actions and to stop breaches of international law. In the EU, the Treaties also allow imposition of sanctions. The EU sanctions affecting the aviation and space sectors correspond to the EU general legal framework of sanctions, including lists of restricted goods, technologies and services. The nature of cooperation among States in space justifies possible derogations from the restrictive measures and explains why competent authorities may, in strictly defined circumstances, authorize certain transactions. Still, it seems that the lessons learnt from the present situation will accelerate efforts to ensure that the EU is less depended on third states in space projects. The EU's autonomy in space has now emerged as a strategic objective.

KEYWORDS

sanctions, restrictive measures, Council Regulation (EU) No 833/2014, aviation, space

SŁOWA KLUCZOWE

sankcje, środki ograniczające, Rozporządzenie Rady (UE) nr 833/2014, lotnictwo, kosmos

1. INTRODUCTION

Russia's aggression[1] against Ukraine in February 2022 met with a swift reaction of the space community. Several research organisations and space agencies, including the Deutsches Zentum für Luft-und Raumfahrt (German Aerospace Center, DRL), the European Organization for Nuclear Research (CERN) and the G6 network[2] decided to suspend or end their cooperation with Russian institutions.[3] At the time, the European Space Agency and Roscosmos were preparing for a vital step in the Exo Mars mission, a joint scientific and engineering project

[1] The term "aggression" was used to describe what Russia declared on 24 February 2022 to be a "special military operation" in Ukraine in the Resolution adopted by the General Assembly of the United Nations on 2 March 2022, A/RES/ES-11/1. On 24 March 2022 the General Assembly adopted Resolution ES-11/2 entitled "Humanitarian consequences of the aggression against Ukraine" (A/RES/ES-11/2).

[2] The G6 network unites six large multidisciplinary European Research Performing Organisations, the Consiglio Nazionale delle Ricerche, the Centre National de la Recherche Scientifique, the Consejo Superior de Investigaciones Científicas, the Helmholtz-Gemeinschaft Deutscher Forschungszentren, the Leibniz-Gemeinschaft and the Max-Planck-Gesellschaft.

[3] As stated in the communication of 3 March 2022 of the DLR, "All collaboration activities with Russian institutions on current projects or projects in the planning stage will be terminated. There will be no new projects or initiatives with institutions in Russia", DLR ceases bilateral cooperation with Russia, https://www.dlr.de/content/en/articles/news/2022/01/20220303_dlr-ceases-bilateral-cooperation-with-russia.html (accessed 10.04.2023). On 8 March 2022, the Council for the European Organization for Nuclear Research (CERN) decided that the Observer status of the Russian Federation in CERN was suspended until further notice and that CERN would not "engage in new collaborations with the Russian Federation and its institutions until further notice", CERN response to the aggression against Ukraine, https://council.web.cern.ch/sites/default/files/c-e-3626_Resolution_re_Russia%20.pdf (accessed 10.04.2023). In its Common Statement of Solidarity with the Sovereign State of Ukraine of 17 March 2022, the G6 said that it saw "no alternative to a complete freeze of scientific interactions with Russian institutions for the time being" (https://www.helmholtz.de/assets/helmholtz_gemeinschaft/Downloads/G6_Satement_on_the_Russian_Invasion_of_Ukraine.pdf) (accessed 10.04.2023).

that spanned several years.[4] The Rosalind Franklin rover was scheduled to be launched in September 2022, to reach Mars in June 2023 and collect data there, alongside NASA and Chinese rovers, but when the hostilities broke up the mission was suspended,[5] and the rover, having successfully passed its system qualification and flight acceptance review, was sent to a warehouse.[6] On the other side, Roscomos decided to withdraw its personnel from the launching centre in Kourou in the French Guiana and suspend all Soyuz launches from Europe's Spaceport, prompting the European Commission to assure the continuity and quality of the Gallileo and Copernicus services.[7] Launches of European satellites from Baikonur, including the UK satellites for the OneWeb broadband constellations, were postponed too.[8] There appeared uncertainty as to the continuous cooperation on the International Space Station beyond 2024.[9] At present, the ISS seems to be the sole remaining joint space project, with Expedition 69 that began in March 2023 including three Roscosmos and three NASA crew members, and one from the United Arab Emirates.[10]

The background to these events includes the fact that Russia and Ukraine have been trade partners and manufacturers of components (such as engines or first-stage rockets) and full space systems, as well as launch service providers (since 2011 the ESA has launched its Copernicus and Galileo satellites using the Russian Souyz launcher). Ukraine was recognized for its mega-freighter jets used

[4] On the first stage of the Exo Mars mission and the role of Polish scientists in it see *Wystrzelono sondę ExoMars, która będzie szukać życia na Marsie*, Nauka w Polsce, 14.03.2016, https://naukawpolsce.pl/aktualnosci/news%2C408793%2Cwystrzelono-sonde-exomars-ktora-bedzie-szukac-zycia-na-marsie.html (accessed 10.04.2023). The goal of the mission is to determine if there has ever been life on Mars and to better understand the history of water on the planet. The second phase of the mission was interrupted by the COVID pandemic in March 2022: ESA Press Release of 12 March 2020, *Exo Mars to take off for the Red Planet in 2022*, https://www.esa.int/Newsroom/Press_Releases/ExoMars_to_take_off_for_the_Red_Planet_in_2022 (accessed 10.04.2023).

[5] ESA Press Release of 17 March 2022, *ExoMars suspended,* https://www.esa.int/Newsroom/Press_Releases/ExoMars_suspended (accessed 10.04.2023).

[6] ESA Press Release of 28 March 2022, *Rover ready – next steps for Exo Mars,* https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration/Exploration/ExoMars/Rover_ready_next_steps_for_ExoMars (accessed 10.04.2023).

[7] Statement by Thierry Breton, European Commissioner for Space, following the decision by Roscosmos to withdraw from the Guiana Space Centre in Kourou, 26 February 2022 https://defence-industry-space.ec.europa.eu/statement-thierry-breton-european-commissioner-space-following-decision-roscosmos-withdraw-guiana-2022-02-26_en (accessed 10.04.2023).

[8] Press Release by Arianespace of 4 March 2022, *Suspension of Soyuz launches operated by Arianespace & Starsem*, https://www.arianespace.com/press-release/suspension-of-soyuz-launches-operated-by-arianespace-starsem/ (accessed 10.04.2023).

[9] B. Tobias, *Russia to Pull Out of International Space Station,* BBC, 26.07.2022, https://www.bbc.com/news/world-europe-62308069 (accessed 10.04.2023).

[10] International Space Station. Mission Summary, https://www.nasa.gov/sites/default/files/atoms/files/exp-69-summary_0.pdf (accessed 10.04.2023).

to transport large geostationary satellites from their manufacturing site to the launch sites.[11] In general, the space manufacturing and launch market is small and concentrated, and both Russia and Ukraine have played an important role in it and, which is no surprise given their long history of presence in space, have not just been buyers of space technology.

2. THE PURPOSE OF SANCTIONS

The systemic reaction of the European Union and of a number of states such as, e.g., the US, the UK, Norway, Switzerland, Japan, or Australia to the aggression against Ukraine is that of economic and personal sanctions. In the EU, the subsequent "sanctions packages" now in place are a continuation of the measures first adopted in 2014 in view of the annexation of Crimea. Since the United Nations first applied sanctions in the 1960s (first against South Africa, later, in the 1990s against Iraq, Yugoslavia, Libya, and in 1999, for the first time against a non-State actor, Al Qaeda),[12] the purpose of sanctions remains unchanged. It is to persuade states, entities, companies, and individuals to change their conduct, to prevent escalation of conflict, to cut off the resources that could be used to pursue the operations that disrupt international peace and security. This was reflected in the recitals of Council Decision 2014/145/CFSP of 17 March 2014[13]: "In the current circumstances, travel restrictions and an asset freeze should be imposed against persons responsible for actions which undermine or threaten the territorial integrity, sovereignty and independence of Ukraine, including actions on the future status of any part of the territory which are contrary to the Ukrainian Constitution, and persons, entities or bodies associated with them". With the situation worsening, and in February 2022 reaching the stage when Russia's military operation in Ukraine was announced and Russian armed forces began an attack on Ukraine, the Council considered that: "In view of the gravity of the situation, and in response to Russia's actions destabilising the situation in Ukraine, it is appropriate to introduce further restrictive measures related to the finance,

[11] OECD Science, Technology and Industry Policy Paper November 2022, No. 137. A new landscape for space applications, Illustrations from Russia's war of aggression against Ukraine, https://www.oecd-ilibrary.org/docserver/866856be-en.pdf?expires=1681208766&id=id&accname=guest&checksum=AB32B1CFC5EDC1B70F8649E90B772134 (accessed 10.04.2023).

[12] J-M. Thouvenin, *History of Implementation of Sanctions*, (in:) M. Asada (ed.), *Economic Sanctions in International Law and Practice*, London/New York 2020, p. 86; M. Kanetake, *Implementation of Sanctions. Japan*, (in:) M. Asada, *Ibidem*, p. 141.

[13] Recital 4 of Council Decision 2014/145/CFSP of 17 March 2014 concerning restrictive measures in respect of actions undermining or threatening the territorial integrity, sovereignty and independence of Ukraine, OJ L 78, 17.3.2014, pp. 16–21.

defence, energy, aviation, and space sectors",[14] supplementing and extending those adopted previously.

3. THE LEGAL BASIS OF SANCTIONS IN THE EU. "SANCTIONS PACKAGES"

The legal basis for the Union's action is to be found in both Treaties. Article 29 of the Treaty on European Union,[15] part of the Treaty's provisions on the Common Foreign and Security Policy, authorizes the Council to adopt decisions which define the approach of the Union to a particular matter of a geographical or thematic nature. Based on Article 215(2) of the Treaty on the Functioning of the European Union,[16] where a decision adopted in the framework of the CFSP so provides, the Council may adopt restrictive measures against natural or legal persons and groups or non-State entities. A Council Regulation, adopted on a joint proposal of the High Representative of the Union for Foreign Affairs and Security Policy and of the European Commission, gives effect to the measures provided for in a Council Decision. Regulatory action at the level of the Union is necessary in order to ensure their uniform application.

In line with the common classification of sanctions into asset freezes, arms embargoes, commodity interdictions, travel bans and diplomatic sanctions,[17] the EU has put in place restrictive measures that affect persons, both natural and legal, and entities and measures that affect trade with Russia. The former include assets freeze and a ban on providing economic resources available to the sanctioned persons, the latter cover a variety of export or import bans and bans on providing related services, so that trade in restricted goods should not be supported in any other manner.

Personal sanctions are applied based on Council Decision 2014/145/CFSP of 17 March 2014 concerning restrictive measures in respect of actions undermining or threatening the territorial integrity, sovereignty and independence of Ukraine,[18] and the corresponding Council Regulation (EU) No 269/2014 of 17 March 2014 concerning restrictive measures in respect of actions undermining or threat-

[14] Recital 10 of Council Decision (CFSP) 2022/327 of 25 February 2022 amending Decision 2014/512/CFSP concerning restrictive measures in view of Russia's actions destabilising the situation in Ukraine, OJ L 48, 25.2.2022, p. 1.

[15] In Title V, Chapter 2 of the TEU. Consolidated version of the Treaty on European Union, OJ C 326, 26.10.2012, p. 13.

[16] Consolidated version of the Treaty on the Functioning of the European Union, OJ C 326, 26.10.2012, p. 47.

[17] R. Gordon, M. Smyth, T. Cornell, *Sanctions Law*, Oxford 2019.

[18] Council Decision 2014/145/CFSP.

ening the territorial integrity, sovereignty and independence of Ukraine.[19] The persons targeted are not only those responsible for, supporting or implementing such actions or policies, or those that provide material and financial support for them, but also those who benefit from the annexation of Crimea, who conduct transactions with the separatist groups in the Donbas region, and those whose business operations provide a substantial source of revenue to the Government of the Russian Federation, as well as persons associated with them. The reasons for including each of those targeted actors are stated in an Annex (to both the Council Decision and the Council Regulation). The sanctions' list now includes Valentina Tereshkova, the first woman in space, now a member of the *State Duma*. She was listed on 16 December 2022 due to the fact that on 3 October 2022 she voted in favour of the illegal annexation of the regions of Donetsk, Luhansk, Kherson and Zaporizhia, and their incorporation into the Russian Federation as federal subjects.[20]

Trade sanctions follow from Council Decision 2014/512/CFSP of 31 July 2014 concerning restrictive measures in view of Russia's actions destabilising the situation in Ukraine,[21] and the corresponding Council Regulation (EU) No 833/2014 of 31 July 2014 concerning restrictive measures in view of Russia's actions destabilising the situation in Ukraine.[22] All of the above have been revised, and since Russia's full scale aggression against Ukraine in February 2022, by the spring of 2023, there have already been ten "sanctions packages", each new package providing for more extensive and fine-tuned measures. Among them, those affecting the aviation and space sectors, as well as persons, companies and entities associated with them.

4. THE CONCEPT OF TARGETED SANCTIONS

The fact that the legal instruments governing restrictive measures are revised and updated shows a commitment to target them at specific entities, goods, technologies and economic sectors where they can be most effective and produce the intended result.[23] Thus, the effectiveness of sanctions depends on a thorough

[19] OJ L 78, 17.3.2014, p. 6 ("Regulation 269/2014").

[20] Annex I to Regulation 269/2014, position 1293. Council Implementing Regulation (EU) 2022/2476 of 16 December 2022 implementing Regulation (EU) No 269/2014 concerning restrictive measures in respect of actions undermining or threatening the territorial integrity, sovereignty and independence of Ukraine, OJ LI, 16.12.2022, p. 318.

[21] OJ L 229, 31.7.2014, p. 13.

[22] OJ L 229, 31.7.2014, p. 1 ("Regulation 833/2024").

[23] A. Cieśliński, *System unijnych sankcji celowych w związku z agresją Rosji przeciwko Ukrainie*, 'Europejski Przegląd Sądowy' 2022, No. 9, p. 41.

understanding of where the economy of the aggressor's country is strongest, trade in which goods is most profitable, and which industries are most dependent on imported technologies. A good orientation in the complexities of international trade relations helps define the restrictive measures in a way that the economic potential that can yield the resources necessary to support military action that breaches international law is curtailed. This is why the EU regulations include lists of goods and technologies that cannot be exported to or imported from Russia, and designate entities which cannot be parties to transactions with EU subjects.

5. OTHER ASPECTS OF A SANCTIONS SYSTEM

From the perspective of the states that impose restrictive measures, it is important to ensure that they are observed and to prevent their circumvention. The EU regulations require Member States to lay down rules on penalties applicable to infringements. The penalties provided for must be effective, proportionate and dissuasive (cf. Article 15 of Regulation 269/2014, Article 8 of Regulation 833/2014). In Poland, such penalties were introduced by the Act of 13 April 2022 on special measures for counteracting support for the aggression against Ukraine and those serving the protection of national security,[24] and include both criminal and administrative penalties.

On the other hand, before the onset of events that call for imposition of sanctions, states typically remain in regular economic relations between each other. While some operations may be stopped immediately, some time may be needed to discontinue business in other sectors of the economy. Therefore, sanctions-involving regulations usually grant economic operators some time to execute existing contracts, to wind up a business, or to disinvest. Transition periods are set and contracts concluded before the effective date of the restrictive measures are allowed to continue until a fixed date, while new contracts cannot be made. Sanctions regulations also allow flexibility so that some transactions may be authorized by the competent authorities, and the EU Regulations provide that each Member State should designate such competent authorities (Article 16 of Regulation 269/2014, Article 9 of Regulation 833/2014).

[24] Dz. U. (Journal of Laws) 2023, item 129, as amended.

6. EU SANCTIONS IN THE AVIATION SECTOR AFFECTING FLIGHTS

The aviation sector was one where restrictive measures could take immediate effect. Council Regulation (EU) 2022/334 of 28 February 2022[25] closed the EU airspace to Russian air carriers. Landing in, taking off and overflying the territory of the EU became prohibited for any aircraft operated by Russian air carriers, for any Russian registered aircraft, and for any non-Russian registered aircraft which is owned or chartered, or otherwise controlled by any Russian natural or legal person, entity or body (Regulation 833/2014, Article 3d). The prohibition thus covers private aircraft owned by Russian nationals, and those registered in the EU or in a third state that are chartered by Russian nationals, including by those with double Russian and EU or a third state nationality. Humanitarian considerations can justify a derogation; also, diplomatic flights can be allowed by competent authorities. An emergency landing or an emergency overflight are allowed.

Russian airspace too is closed to carriers from nearly 40 countries. Still, it seems that the aviation sector is flexible enough to adjust to the situation. According to IATA, in 2021 passenger numbers to and from Russia and Ukraine represented no more than 2% of the country's total passenger traffic for most European countries, with Bulgaria (5%), Poland (7%), Turkey (8%), and Cyprus (12%) standing out.[26] Sanctions mean that flights have to be rerouted or cancelled. Passengers face longer flight times and higher costs and cargo traffic is also affected, but this presents opportunities for other airlines to fill the gaps.

7. EU SANCTIONS IN THE AVIATION AND SPACE SECTORS THAT AFFECT GOODS AND TECHNOLOGY

In parallel, trade restrictions apply there too. Certain goods and technologies suited for use in aviation or the space industry, jet fuel and fuel additives, whether or not originating in the Union, cannot be provided to any natural or legal person, entity or body in Russia or for use in Russia (Regulation 833/2014, Article 3c). The goods and technology concerned are listed in Annex XI to Regulation 833/2014 and include, i.a., aircraft, spacecraft and parts thereof, pneumatic tyres of rubber of a kind used in aircraft, brake linings and pads, all identified by

[25] OJ L 57, 28.02.2022, p. 1.

[26] IATA Factsheet. The impact of the war in Ukraine on the aviation industry, 25.03.2022, https://www.iata.org/en/iata-repository/publications/economic-reports/the-impact-of-the-conflict-between-russia-and-ukraine-on-aviation/ (accessed 10.04.2023).

their corresponding CN Codes, which ensures precision of definition. The current shape of Annex XI, including its division into parts A, B, C and D, illustrates how the EU expanded the list, and what transition periods it provided with regard to contracts concluded before a certain date (when there were new additions to the list), allowing that they could be executed until a certain future date following expansion of the measures. By way of example, the latest restrictions adopted on 25 February 2023 allow for execution of contracts concluded before 26 February 2023 until 27 March 2023, thus offering European business operators some time to perform contracts that cover the goods specified in Part D of Annex XI. Jet fuel and fuel additives are listed in Annex XX.

However, the restrictive measures concerned are not only those specified in Article 3c of Regulation 833/2014 and expressly identified as those applicable in the aviation and space sectors, but also those that cover dual use goods and technology (i.e., those that can have both civilian and military application, Article 2) and goods and technology which might contribute to Russia's military and technological enhancement, or the development of the defence and security sector (Article 2a). Details of the former are to be found in Regulation (EU) 2021/821 of the European Parliament and of the Council of 20 May 2021 setting up a Union regime for the control of exports, brokering, technical assistance, transit and transfer of dual-use items (recast)[27] and in its Annex I that establishes the common list of dual-use items that are subject to controls in the Union. Examples of items belonging to the aerospace and propulsion category[28] include: space launch vehicles, spacecraft, terrestrial equipment, air-launch platforms, sub-orbital craft, launch support equipment, all of which are described in detail with references to their technical specifications. Details of the latter are to be found in Annex VII to Regulation 833/2014; the list includes items representing categories such as electronics, computers, telecommunications, information security, sensors and lasers, navigation and avionics, aerospace and propulsion.

The restrictions are wide, as the language of Regulation 833/2014 aims at capturing a range of possible transactions, whatever they area called. Thus, it is prohibited to "sell, supply, transfer or export, directly or indirectly" the restricted goods and technology to recipients in Russia (any natural or legal person, entity or body) or for use in Russia. The restrictive measures cover also services in relation to the goods and technologies listed, such as overhaul, repair, inspection, replacement, modification, defect rectification of an aircraft or component (with the exception of pre-flight inspection).

[27] OJ L 206, 11.06.2021, p. 1, last amended by Commission delegated Regulation (EU) 2023/66 of 21 October 2022 amending Regulation (EU) 2021/821 of the European Parliament and of the Council as regards the list of dual-use items, OJ L 9, 11.01.2023, p. 1.

[28] Other categories of dual-use goods and technology include, e.g., electronics, computers, sensors and lasers, navigation and avionics.

Affected is not only trade in goods and technology and the services related to them, but also a number of other activities that contribute to the vitality of the aviation and space industry, such as insurance and reinsurance, technical assistance, brokering services financing or financial assistance related to the goods and technology covered. Comprehensive legal definitions of the notions of "technical assistance", "brokering services" or "financing or financial assistance" (in Article 1(o)) make the ban far-reaching and the sanctions will impact leased aircraft, spare parts, maintenance and training.

8. EXEMPTIONS IN THE EU SANCTIONS RELATING TO THE SPACE SECTOR

The uniqueness of exploration and exploitation of Outer Space as a common endeavour of mankind[29] and the fact that it has (at least until recently) been pursued exclusively by States, has not been overlooked. Namely, the competent authorities of Member States may derogate from the Regulation 833/2014 prohibitions and authorize transactions in restricted goods, technologies, or allow provision of related technical or financial assistance where they are intended for intergovernmental cooperation in space programmes (Article 2(4) and (5), Article 2a(4) and (5), however, the end-user and the use must be non-military.

A similar approach is used to provide for derogations from the ban on participation of Russian entities in EU public procurement contracts. As of July 2022, a public procurement contract cannot be awarded to (or continue with the participation of) a Russian person (as defined in Article 5k(1) of Regulation 833/2014); however, the competent authorities may authorize the award and continued execution of contracts intended for intergovernmental cooperation in space programmes (Article 5k(2(b)).

Another exception, adopted in 2015 and 2017, was clearly tailored to the needs of European launch service providers, European space programmes and European satellites manufacturers, as well as the then stage of the Exo Mars mission (the Exo Mars descent module and the carrier module). An exception to the ban on providing hydrazine and two other pyrotechnic materials[30] that are listed in the Common Military List was introduced. As hydrazine and the other two

[29] As stated in the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (adopted by the General Assembly of the UN in its resolution 1962 (XVIII) of 13 December 1963), "The exploration and use of outer space shall be carried on for the benefit and in the interests of all mankind".

[30] Hydrazine (CAS 302-01-2), unsymmetrical dimethyl hydrazine (CAS 57-14-7), monomethyl hydrazine (CAS 60-34-4). CAS number is a unique identification number assigned to every chemical substance.

substances are necessary for launching satellites or for the fuelling of satellites, these were allowed under terms relating to technical requirements of launching operations, and in strictly defined amounts (Article 4(2a) and (2aa) of Regulation 833/2014).[31]

This approach shows that the EU remains flexible and realistic about the need to have a system in place that does not block that cooperation completely. There are checks, as the derogations apply to intergovernmental space programmes over which States retain control, and there is a system of authorisations that gives the Member States an opportunity to thoroughly review the proposed transaction. This guarantees that the derogations from the sanctions will remain an exception.

9. EFFECT OF SANCTIONS IN THE AVIATION AND SPACE SECTORS

It seems that both the EU Member States' and Russia's aviation sectors have adjusted to the sanctions regime. Both the availability of flights that are offered on the market by a large number of airlines and the existence of alternative routes ensure that passenger and cargo traffic continues despite the fact that the airspace is reciprocally closed by the EU and Russia. In the space sector, where advanced technologies and high precision goods are of the essence and the supply chain is small, trade sanctions do have an impact on scientific cooperation in the exploration of space and on its commercial uses. Restrictions on access to goods and technologies must inevitably slow down progress before one's own alternative resources and viable cooperation with third parties can be developed. So far, the EU has successfully overcome the difficulties encountered back in 2022 with launching satellites,[32] while the impact of sanctions on the Russian programmes is yet to be assessed.

Beyond the immediate effect of sanctions that for economic operators mean that the contracts they have made will not be performed for at least as long as the trade bans remain in place, it seems that Russia's aggression against Ukraine has sped up processes in the EU that are aimed at better understanding the impor-

[31] For a thorough explanation of legal aspects of launch services see: P. van Fenema, *Legal Aspects of Launch Services and Space Transportation*, (in:) F. von der Dunk, F. Tronchetti (eds), *Handbook of Space Law*, Cheltenham 2015, p. 382.

[32] The UK's OneWeb broadband constellation of satellites was launched by SpaceX. Based on a new contract signed in November 2022, Copernicus satellites (part of the EU's Earth Observation Programme) will be launched between 2023 and 2026 by Arianespace from the Kourou Spaceport in French Guiana.

tance of space for national security and defence.[33] The March 2023 Joint Communication to the European Parliament and the Council on EU Space Strategy for Security and Defence issued by the European Commission and the High Representative of the Union for Foreign Affairs and Security Policy proposes a number of measures to strengthen the EU's technological sovereignty so that the EU is less dependent of third countries, has autonomous access to space, and can better assess and address risks to security in space[34]. The EU is planning to engage with the UN on space and security and to partner with the US and NATO on space security and defence.

Overall, "strategic autonomy of the EU and its Member States in space" seems to be the key concept for the years to come, and it is a lesson learnt from the current situation that has led to sanctions being imposed in the space sector.

REFERENCES

Asada M. (ed.), *Economic Sanctions in International Law and Practice*, London/New York 2020

Fenema van P., *Legal Aspects of Launch Services and Space Transportation*, (in:) F. von der Dunk, F. Tronchetti (eds), *Handbook of Space Law*, Cheltenham 2015

Cieśliński A., *System unijnych sankcji celowych w związku z agresją Rosji przeciwko Ukrainie*, 'Europejski Przegląd Sądowy' 2022, No. 9

Gordon R., Smyth M., Cornell T., *Sanctions Law*, Oxford 2019

[33] For instance, satellite networks and space launch facilities are deemed to be critical infrastructure.

[34] JOIN(2023) 9 final, https://data.consilium.europa.eu/doc/document/ST-7315-2023-INIT/en/pdf (accessed 11.04.2023).

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ARTEMIS ACCORDS – A NEW ERA OF SPACE LAW OR AN INITIATIVE OF THE WORLD'S SUPERPOWER?

Abstract

The article below addresses the Artemis Accords. It is a non-binding act by which its signatories adopted a set of principles for space exploration. Even though it is not an international treaty, it is a controversial issue. The author presents the Artemis Accords against the background of international agreements, soft-law and domestic regulations, aiming to answer the question of their revolutionary character and of them being an agreement between states that strive for a common goal. Firstly, the author presents the problem of space mining and the related possibilities. There are numerous benefits from this new branch of economy, but there is also a risk of global conflict on the ground of a race for space resources. After this, the author presents the state of affairs of international law and tries to draw crucial conclusions on the subject of space mining. The last part of the paper is devoted to an analysis of the Artemis Accords as a non-binding agreement between states and as a new platform which allows the launch of a new era of conquest of outer space. At the end the author presents his opinion on the Artemis Accords as an instrument of a new space policy of world's superpower and its allies.

KEYWORDS

space law, Artemis Accords, space mining, responsibility and liability of state

SŁOWA KLUCZOWE

prawo kosmiczne, Porozumienie Artemis, górnictwo kosmiczne, odpowiedzialność państwa

1. INTRODUCTION

Mankind fulfilled their dream about journeys in the outer space in the 20th century. This idea was not feasible at the start, but the development of technology has brought us to a point where our civilisation is not able to function properly without space objects. Navigation, weather forecasts, television and communication, all of these innovations would not have been possible without satellites launched in outer space.

The international dimension of space activities was the reason for adopting five intergovernmental agreements which established basic rules of international law of the outer space. On 13 October 2020 yet another such agreement was signed: the Artemis Accords: Principles For Cooperation In The Civil Exploration And Use Of The Moon, Mars, Comets, And Asteroids For Peaceful Purposes. Despite the fact that it is not an act prepared by the COPUOS, its significance can be crucial for the basics of the space industry and space mining may well become part of this industry within the next decades. For some authors this is the beginning of the era of space capitalism.[1]

This text addresses the importance of rules contained in the Artemis Accords and their likely influence on international space law. The author tries to find out if the Accords are compliant with *corpus iuris spatialis* and considers the possibility of establishing an international custom for regulating the issues of space mining.

2. SPACE MINING

The development of the industry and our dependence on electronic devices means humanity needs to think about natural resources, which may be exhausted during increasingly intensive exploitation. This forces us to seek other sources of rare natural materials in places which are not subject to national sovereignty. After discovering various resources on the seabed and establishing international

[1] T. Nugraha, *Space-Centric Concept to Answer Tomorrow Space Challenge: A Small Step for Future Space Law,* 'Diponegoro Law Review' 2021, Vol. 6, No. 2, p. 191.

maritime law, which includes rules of governance of this area, people have to look for new possibilities to obtain resources necessary for the world's economy. Space industry is a branch of economy which was not stalled even by the global COVID-19 pandemic.[2]

This space where resources have not yet been exhausted is outer space. Enormous amounts of valuable materials are located on many celestial bodies. It is in particular crucial for the development of economy in the next decades because of the absence of many types of rare materials on the surface of the Earth, which are, however, present in outer space. It is important to see that sources in outer space are very valuable. Neil DeGrasse Tyson, a renowned physicist and populariser of science, stated that "The first trillionaire there will ever be is the person who exploits the natural resources on asteroids".[3] This sentence is supported by estimations which indicate that e.g. (6) the Hebe asteroid has enough iron to meet human demands for more than a million years, enough nickel for 83 million years and gold for over 700 thousands years.[4] The first company interested in space mining, Planetary Resources, was founded in 2012.[5]

Such amounts may impact imagination and inspire specific activities of states. On April 2021, a Chinese rocket Long March 6 launched a small space mining test spacecraft NEO-1 into orbit[6]. It was the next step after landing the Rosetta spacecraft on the 67P/Churyumov–Gerasimenko comet, which was the first landing of an artificial satellite on a comet in history.[7] These facts illustrate that the conquest of the outer space and the use of its assets will be a problem of the near future. In light of these circumstances, the international society has to address legal aspects of space mining.

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[2] A. Kamalnath, H. Sarkar, *Regulation of Corporate Activity in the Space Sector,* 'Santa Clara Law Review' 2022, Vol. 62, p. 377.

[3] K. Krammer, *Neil deGrasse Tyson Says Space Ventures Will Spawn First Trillionaire. A Passion for Exploration is the Fuel to an Innovative Economy, Says Astrophysicist Neil deGrasse Tyson*, NBCNEWS, 05.05.2015, https://www.nbcnews.com/science/space/neil-degrasse-tyson-says-space-ventures-will-spawn-first-trillionaire-n352271 (accessed 6.01.2023).

[4] M. Matacz, *W górnictwie kosmicznym czekają gigantyczne pieniądze,* Nauka w Polsce, 22.09.2020, https://naukawpolsce.pl/aktualnosci/news%2C83920%2Cw-gornictwie-kosmicznym-czekaja-gigantyczne-pieniadze.html (accessed 6.01.2023)

[5] M. Wall, *Asteroid Mining Venture Backed by Google Execs, James Cameron Unveiled,* space.com, 24.04.2012, https://www.space.com/15395-asteroid-mining-planetary-resources.html (accessed 20.01.2023).

[6] A. Jones, *China Launches Space Mining Test Spacecraft on Commercial Rideshare Mission,* SpaceNews, 27.04.2021, https://spacenews.com/china-launches-space-mining-test-spacecraft-on-commercial-rideshare-mission/ (accessed 6.01.2023).

[7] *Rosetta to Deploy Lander on 12 November*, ESA, 26.09.2014, https://www.esa.int/Science_Exploration/Space_Science/Rosetta/Rosetta_to_deploy_lander_on_12_November (accessed 6.01.2023).

3. FIRST ACT OF THE INTERNATIONAL LAW ON OUTER SPACE

From 1969 to 1972, during manned missions to outer space, about 400 kg of rock samples were bought to Earth. This material is still being examined and results of research are being constantly released.[8] Despite the important role these samples play in research on outer space, it is a relatively small amount of material. When space mining takes off on a large scale, the amount of space material brought back will be many times greater. It forces us to think about the legal ground of the mining activity in space under the five basic international treaties that address space law.

First of all, it is necessary to examine provisions included in the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space as the foundation for subsequent international agreements made in the following years.[9] The text of the Declaration emphasises the common interest of humankind in exploration and use of outer space and indicates that it should be carried on for the benefit of all states irrespective of their degree of economic or scientific development.

The resolution also declares freedom of exploration and use of the outer space and celestial bodies for all states where no state is entitled to appropriate celestial bodies in any way. The Declaration contains important provisions concerning responsibility of states that carry out space activity. States are responsible for acts performed not only by their national agencies, but also by non-governmental entities. The Declaration is a modern document which imposes a requirement that states authorize and supervise private hazardous activity. This model was repeated in numerous subsequent international agreements and the International Law Commission adopted it as the ground for liability of states in its works on the draft convention on harmful effects of activity non-prohibited by international law.[10] This provision is linked with states' entitlement to request consultation in case of danger of harmful results of space activity of another state, which results from the obligation of international cooperation and mutual assistance. The launching State retains jurisdiction and control of a space object and personnel. This State is also liable for damage done to another state or its natural or juridical persons. Lastly, a very important provision states that astronauts are

[8] E. Krajczyńska, *Dr Anna Łosiak: księżycowe próbki dadzą wgląd w najdalszą historię naszej planety*, Nauka w Polsce, 29.08.2022, https://naukawpolsce.pl/aktualnosci/news%2C9-3469%2Cdr-anna-losiak-ksiezycowe-probki-dadza-wglad-w-najdalsza-historie-naszej (accessed 6.01.2023)

[9] Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, A/RES/1962(XVIII).

[10] Prevention of Transboundary Harm from Hazardous Activities, A/CN.4/L.601/Corr.1.

considered to be envoys of humankind, which shows that humanity advocates unity in matters of space.

4. THE PROBLEM OF SPACE MINING UNDER CORPUS IURIS SPATIALIS

The provisions presented above were repeated and developed by subsequent treaties that addressed space law. The problems associated with the Artemis Accord were taken into consideration in regulations on the use of outer space and celestial bodies and so was the use of materials found in space.

The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies[11] is the basic agreement in space law. It contains many important provisions which are not directly concerned with space mining. It establishes general principles bounding on states for the use and exploration of outer space, but they can be unclear.[12] The Treaty repeats the principles of the common interest of mankind and benefits of all states and establishes the duty of international cooperation and mutual assistance. The freedom of access to all areas of celestial bodies and prohibition of claims to any part of outer space, contrary to aerial law,[13] state that any part of space can be part of a state, but it does not determine the possibility of use of sources located in outer space. The Treaty also contains a duty of states to carry out their activities in accordance with international law whereby the use of sources should be regulated by provisions of international law. In case of lack of international treaties, it is necessary to use other sources of international law. The next important provision is the prohibition of military installations in space, but, *a contrario,* it does not exclude the possibility of civilian or mining facilities. The use of military personnel is not forbidden but only for peaceful reasons. States are responsible for their activity in space, including for the activity of their non-governmental entities and they are liable for damage that results from launching a space object. There is a repetition of the provision on jurisdiction of the state over the launched space object and its personnel. All installations in space should be open for astronauts from other states on the basis of reciprocity and activity in space shall not cause contamination and it shall be carried out

[11] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, opened for signature on 27 January 1969, Res. 2222 (XXI).

[12] R. Lee, *Law and Regulation of Commercial Mining of Minerals in Outer Space*, Dordrecht/Heidelberg/London/New York 2012, p. 163.

[13] R. Abeyratne, *Space Security Law*, Berlin/Heidelberg 2011, p. 85.

with respect for the natural environment. This last provision can be important for space mining, because it relates to the interference in the natural environment and it is not obvious whether states would be willing to provide access to their mining stations located in space.

The Outer Space Treaty does not directly refer to the use of space resources by states, but it contains many important provisions which are crucial for the exploration of space, e.g. a duty of cooperation and mutual assistance, responsibility and liability of states, protection of natural environment and access of astronauts to installations of other states. *Corpus iuris spatialis* also includes four other agreements. They are the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space,[14] Convention on International Liability for Damage Caused by Space Objects,[15] Convention on Registration of Objects Launched into Outer Space[16] and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.[17]

The last is the most important from the point of view of space mining, because it directly addresses obtaining sources from space. This is the reason for many controversies surrounding this Treaty and ultimately its failure. It has been ratified by only 18 states, some of which carry out the most advanced activity in outer space, so it cannot be considered a universal agreement.[18]

The Preamble of the Agreement contains the important directives for the exploration and use of the Moon and celestial bodies. The distinction of the Moon in title and in the first sentences of the agreement becomes clear when one realizes that the Moon is a unique natural satellite of the Earth. The Moon is the primary subject and its legal status is regulated similarly to the status of other celestial bodies. At first sight it is obvious that the adoption of the Agreement was mentioned as a method of prevention of future conflicts for its resources and at the same time the aim of the Agreement is to adopt a universal regulation for the exploitation of outer space materials.[19]

The Agreement relates to the Moon and other celestial bodies in the solar system, but it predicts the possibility of other international agreements that regulate

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[14] Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, Moscow, London, Washington, opened for signature 22 April 1968, Res. 2345 (XXII).

[15] Convention on International Liability for Damage Caused by Space Objects, Moscow, London, Washington, opened for signature on 29 March 1972, Res. 2777 (XXVI).

[16] Convention on Registration of Objects Launched into Outer Space, New York, opened for signature on 14 January 1975, Res. 3235 (XXIX).

[17] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, New York, opened for signature on 18 December 1979, UNTS 1363.

[18] B. Skardzińska, *Górnictwo kosmiczne – prawo i perspektywy,* (in:) K. Myszona-Kostrzewa, E. Mreńca, P. Zientarski (eds), *Prawne aspekty działalności kosmicznej*, Warszawa 2019, p. 173.

[19] Moon Agreement Provisional agenda, with annotations, for the 18th session, 1975, A/AC.105/L.82.

the legal status of celestial bodies. One important provision is exclusion from the scope of interest of treaty materials which reach the surface of the Earth by natural means, thereby the Agreement does not address the question of possession of, for example, meteorites which fall on the Earth. It is important due to meteorites' great scientific value and due to the fact that it contains many important minerals, precious for the development of our civilisation.[20] The Agreement repeats the provisions on duty of states to carry out theirs activity in accordance to international law. The Moon and other celestial bodies shall be exploited only in peaceful purposes and any use of force or threat of it is prohibited, which is obviously a reference to the main principles of the Charter of the United Nations.[21] Partial militarization of the outer space is also prevented by a prohibition of placing of weapons, but only nuclear weapons and weapons of mass destruction, on the orbit around and other trajectories. Celestial bodies are prohibited to be fortified and the use and testing of any kind of weapons or carrying of manoeuvres are also forbidden, though the use of military equipment and personnel is possible for peaceful purposes.

Article 4 contains an important yet controversial provision on the problem of exploitation of resources located on celestial bodies. Under this article, the Moon and the other celestial bodies shall be a common province of the mankind, which is a reference to the notion which ambassador Pardo used in the context of the seabed.[22] Despite the fact that there is no description of the notion of common heritage of mankind, Antarctica is considered the third such place.[23] These three areas cannot be occupied by any state.[24] It is important to highlight the use of other words which may lead to a conclusion of distinct understanding of the legal status of all of these areas despite similar or very close international regulations.[25] What is more, exploration and activities of states on the Moon and other celestial bodies shall be carried out for the benefit of all countries irrespective of their level of economic or scientific development. Activity in the outer space should be carried out to improve quality of life on Earth. Article 11 is linked with the provision discussed above and states that celestial bodies and their natural resources are com-

[20] *Ten sztylet faraona Tutanchamona pochodzi z kosmosu. Wykuto go z meteorytu*, 29.07.2019, National Geographic, https://www.national-geographic.pl/artykul/ten-sztylet-faraona-tutanchamona-pochodzi-z-kosmosu-wykuto-go-z-meteorytu (accessed 25.01.2023).

[21] United Nations, Charter of the United Nations, 24 October 1945, 1 UNTS XVI.

[22] A. Pardo, Address to the 22nd session of the General Assembly of the United Nations, U.N. GAOR, 22nd sess., U.N. Doc. A/6695 (18 August 1967).

[23] E. Franckx, *The International Seabed Authority and the Common Heritage of Mankind: The Need for States to Establish the Outer Limits of their Continental Shelf,* 'The International Journal of Marine and Coastal Law' 2010, No. 25, p. 544

[24] Y. Schmidt, *International Space Law and Developing Countries,* (in:) Ch. Brunner, A. Soucek (eds), *Outer Space in Society, Politics and Law*, Vienna 2011, p. 696.

[25] F. Lyall, P. Larsen, *Space Law: a Treatise*, Burlington 2009, p. 181.

mon heritage of mankind, which is one of the reasons of failure of the Treaty.[26] Celestial bodies cannot be subject of claims of sovereignty or occupation, but the same does apply to their resources. States are entitled to explore and use celestial bodies without any discrimination. The international society became obliged to establish an international regime concerning exploitation of natural resources, but contrary to maritime law, this regime has not been established yet. The Treaty laid down directions for future agreements, which include rational management, expansion of opportunities of natural resources and sharing of benefits from resources with other states. The last provision is especially controversial, because based on it, states, at the level that allows space activity, would be obliged to share profits from this activity with other states.

The agreement also repeats provisions of cooperation and mutual assistance in activity in outer space. The next important provision addresses transparency and duty of reporting about space activity to the UN General Secretary and other states. This is also an obligation stipulated in projects of the International Law Commission that focused on liability of states.

Space mining by definition relies on obtaining resources from outer space. Article 6 of the Moon Treaty contains permission for states to collect and remove from the Moon and celestial bodies samples of minerals and other substances. It is a problematic provision, because a sample, by definition, is not an amount that would satisfy the needs of a developed industry. States must recognize that such samples must also be available for other states and the international community interested in scientific investigations. States can use minerals and other substances to support missions, but in appropriate quantities. Moreover, this provision is used in the context of the freedom of scientific investigations without discrimination. Limitation of space mining also involves the duty of protection of the natural environment and prohibition of contaminating it.

Apart from the freedom of scientific investigation, states are also entitled to establish manned or unmanned stations and to send personnel. They are also obliged to adopt practicable measures to safeguard life and health of persons, including offering shelter for persons in distress. States also retain jurisdiction and control over their personnel, objects and any kind of installations.

In the context of collecting of resources liability and responsibility of states for effects of activity in the outer space is crucial. States are obliged to authorize and supervise space activity of non-governmental entities and ensure that their activity is carried out in accordance with the Moon Treaty. This is related to the next controversial obligation to ensure access to space installations, objects etc. for other states aiming to examine compliance of their activity with international law.

[26] V. Pop, *Who Owns the Moon? Extraterrestrial Aspects of Land and Mineral Resources Ownership*, Berlin/Heidelberg 2009, p. 130.

The Moon Treaty is a broad regulation, which in the main part repeats provisions of other international agreements on space law. However, it stipulates such controversial responsibilities that it cannot be adopted by the majority of states, especially those highly advanced in space industry. Therefore, it seems that it will remain an important step but without a real impact on international society and one of the problems of international law is how to encourage further ratifications.[27] This is also the most advanced act of the space law from the point of view of protection of environment.[28]

5. SOFT LAW ON SPACE MINING

Apart from international agreements, there is also an act of soft law which is not binding for countries, but which indicates how the materials obtained in outer space should be used. Soft law in many cases can fill areas not regulated by binding international agreements.[29]

What is important, that adoption of the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries on 4 February 1997 is much more recent than the Moon Treaty.[30] This fact allows us to realize that there was a problem of the lack of universality of the Moon Treaty and of increasing opportunities of space mining. These circumstances forced the establishment of soft law in this subject matter. The Declaration recalls treaties contained in *corpus iuris spatialis* and the Charter of the United Nations. Its preamble emphasizes the important role of co-operation of states and the principle of carrying out of space activity for the benefit of all states, irrespectively on their level of development. The declaration highlights that states are free in determining their participation in international co-operation, but it contains an unclear obligation to act in compliance with the interests and fair principles of co-operation. In particular, highly-developed countries are considered to be obliged to carry out space activities with consideration to developing countries,

[27] F. Tronchetti, *Fundamentals of Space Law and Policy*, New York/Heidelberg/Dordrecht/London 2013, p. 83.

[28] L. Viikari, *The Environmental Element in Space Law Assessing the Present and Charting the Future*, Leiden/Boston 2008, p. 62.

[29] M. de Zwart, D. Stephens, *The Space (Innovation) Race: The Inevitable Relationship Between Military Technology And Innovation,* 'Melbourne Journal of International Law' 2019, Vol. 20, p. 4.

[30] Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries, 4 February 1997, A/RES/51/122.

which involves an obligation to use the most effective and appropriate mode in international co-operation. The declaration also indicates aims of international co-operation, but they are controversial, because it predicts that states are obliged to share technical assistance, which can lead to a conclusion that more developed countries should offer results of their scientific investigations. Moreover, states are encouraged to share their initiatives with the United Nations Programme on Space Applications and to strengthen co-operation under the Committee on the Peaceful Uses of Outer Space.

The declaration described above is an act of soft law, so its provisions are not binding. It is a very optimistic document, but it is hard to imagine a situation where states share their developed technologies in the name of the principle of international co-operation.

6. DOMESTIC REGULATIONS ON SPACE MINING

The variety of sources of international law allows researchers to look for answers not only in binding agreements adopted by the international community, but also on other grounds. Lack of practice in this regard means that there is no relevant international custom, but it is still possible to derive *opinio iuris* from states' unilateral acts. This is important, e.g. in the context of the delimitation of outer space.[31] Two such acts of law that address space mining will be discussed here.

First of all, it is the domestic law of the United States as the pioneer of space activities.[32] Apart from the primary law that governs mining in the United States the country also has the 1872 Mining Law with subsequent amendments,[33] which was a result of the 19th-century Gold Rush. There is also the 2015 U.S. Commercial Space Launch Competitiveness Act,[34] adopted as a response to the unclear legal status of space mining.[35] This act lays down provisions which oblige the state to promote and facilitate U.S. citizens' space activity and provisions which can be controversial and contrary to international law. One of them grants U.S. citizens numerous rights concerning on any asteroid resource or space resource,

[31] O. de Oliveira Bittencourt Neto, *Defining the Limits of Outer Space for Regulatory Purposes*, Heidelberg 2015, p. 65.

[32] P. Dempsey, *Overview of the United States Space Policy and Law,* (in:) R. Jakhu (ed.), *National Regulation of Space Activities*, New York 2010, p. 373.

[33] General Mining Law of 1872, Ch. 152, 17 Stat. 91.

[34] U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114-90, 129 Stat. 704 (2015).

[35] L. Byrd, *Soft Law in Space: A Legal Framework for Extraterrestrial Mining,* 'Emory Law Journal' 2022, Vol. 71(801), p. 818.

including the right to possess, own, transport, use, and sell the asteroid resource or space resource. The act invokes international law, but compliance of this provision with international law is doubtful, because it is not obvious whether natural or juridical persons are entitled to obtain resources from space, even though there is no explicit prohibition of doing so. These doubts cannot be removed by a provision stating that the United States does not assert sovereign or any kind of jurisdiction or ownership of any celestial body.

This short act inspired numerous objections from, e.g., Russia and Brazil, which pertained to the lack of possibility of space mining on the ground of the Outer Space Treaty.[36]

Luxembourg has also adopted its own regulations on space mining. It was the first European state which established rules of space activity.[37] Article I of its space statute states that space resources are capable of being owned. There is no definition of space resources like the one included in the U.S. law,[38] so there is no distinction between biotic and abiotic resources. Entities have to obtain permission from the government to carry out space activity, excluding this pertaining to space communication satellites and frequencies. The act indicates administrative obligations imposed on entities which are compatible with the principles of international law relevant to extra-hazardous activity. In particular, it imposes responsibilities concerning financial stability, which involves insurance and capability to pay compensation for victims of space damage.

The acts of domestic law resented above are not exclusively concerned with space mining, but they contain provisions that refer to this subject matter. Both of them invoke international law, but it is important to highlight that neither the United States nor Luxembourg are parties to the Moon Treaty. From this point of view, they are not bound by many provisions relating to space mining, but only by general responsibilities imposed by other treaties of *corpus iuris spatialis*, especially the Outer Space Treaty.[39]

[36] F. von der Dunk, *Asteroid Mining: International and National Legal Aspects,* 'Michigan State International Law Review' 2017, Vol. 26(1), pp. 96 – 99.

[37] Law 674 of 20 July 2017 on the exploration and use of space resources, Journal Officiel du Grand-Duché de Luxembourg (Official Journal of the Grand Duchy of Luxembourg).

[38] T. Cheney, *There's No Rush: Developing a Legal Framework for Space Resource Activities,* 'Journal of Space Law' 2019, No. 43, p. 9.

[39] P. de Man, *Working Paper No. 189. Luxembourg Law on Space Resources Rests on Contentious Relationship with International Framework,* July 2017, https://ghum.kuleuven.be/ggs/publications/working_papers/2017/189deman (accessed 21.01.2023)

7. ARTEMIS ACCORDS

The Orion spacecraft mission, part of Artemis I, lasted from 16 November to 11 December 2022.[40] It was the beginning of series of activities that aim to take humans to the Moon again. After installing a permanent base on the Moon, the next step of the programme is to reach Mars.[41]

This programme is the realization of the Artemis Accords Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes.[42] This non-binding agreement[43] was signed on 13 October 2020 by directors of space agencies of the United States and seven other countries.[44] In fact, there are 23 signatories of the agreement, among them Poland.[45] Despite the fact that the provisions of the Artemis Accords are not binding on their parties, many important states that carry out space activity, China and Russia to name just two, have not signed them.[46] This is the reason why this agreement is not universal.[47] Parties to the agreement are mostly allies of the United States, whereby this is an example of a new political division of the world and another example of competition between the U.S. and China.[48]

The Artemis Accords emphasise in their preamble values known from *corpus iuris spatialis,* such as the benefit for humankind, and invoke bilateral agreements while at the same time recognize the not common, but mutual interest in the exploration and use of the outer space. This may be a crucial difference, because it may limit the interest to the parties to the agreement. The Artemis

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[40] M. Tuttle, *Artemis I Orion Spacecraft Returns to Kennedy Space Center*, 30.12.2022, NASA Blogs, https://blogs.nasa.gov/artemis/2022/12/30/artemis-i-orion-spacecraft-returns-to-kennedy-space-center/ (accessed 21.01.2023).

[41] A. Ochman, *Misja Artemis 1: Ostatni rozdział, czyli powrót do domu,* 11.12.2022, Nauka to lubię, https://naukatolubie.pl/misja-artemis-1-ostatni-rozdzial-czyli-powrot-do-domu/ (accessed 21.01.2023).

[42] The Artemis Accords Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes, signed 13th October 2020.

[43] R. Deplano, *The Artemis Accords: Evolution or Revolution in International Space Law?,* 'International and Comparative Law Quarterly' 2021, Vol. 70, p. 801.

[44] C. Warner, *International Partners Advance Cooperation with First Signings of Artemis Accords*, NASA, 13.10.2020, https://www.nasa.gov/press-release/nasa-international-partners-advance-cooperation-with-first-signings-of-artemis-accords (accessed 23.01.2023).

[45] *Poland Signs Artemis Accords at IAC*, NASA, 26.10.2021, https://www.nasa.gov/feature/poland-signs-artemis-accords-at-iac (accessed 23.01.2023).

[46] E. Taichman, *The Artemis Accords: Employing Space Diplomacy to De-Escalate a National Security Threat and Promote Space Commercialization,* 'American University National Security Law Brief' 2021, Vol. 11, No. 2, p. 129.

[47] M. Piotrowski, S. Zaręba, *Artemis Accords: Towards New Rules for the Exploitation of Space,* 'The Polish Institute of International Affairs Bulletin' 4 March 2021, No. 47 (1743).

[48] P. Larsen, *Is There a Legal Path to Commercial Mining on the Moon?,* 'University of Pittsburgh Law Review' 2021, Vol. 83, p. 11.

Accords directly invoke former international agreements and emphasize the value of compliance with *corpus iuris spatialis.*[49] The agreement is considered to be the implementation of other international treaties but it also aims to establish beneficial practices for future exploration and use of outer space. The preamble contains aims of the programme, which include exploration of the Moon, Mars and beyond and consideration of coordination and cooperation among present and future actors in space. Moreover, it reemphasizes the collective interest of space exploration and commerce.

The Artemis Accords are not a treaty but a set of principles, guidelines and best practices for the civil exploration and use of outer space, considering principles established in former treaties, aiming to increase the safety of operations, reduce uncertainty, and promote the sustainable and beneficial use of space for all humankind.

Section I lists areas where the relevant activities may be carried out. It is the Moon, Mars, comets, and asteroids, including their surfaces and subsurface, as well as in orbit of the Moon or Mars, in the Lagrangian points for the Earth-Moon system, and in transit between these celestial bodies and locations. This enumeration limits the possibility of carrying out space activities, because there is no mention of other planets or celestial bodies. It also emphasises states' intention to implement measures such as mission planning and contractual mechanisms with entities acting on their behalf. The Artemis Accords allow states to adopt their individual agreements not determining their form, but indicating obligatory provisions of such agreements. There are descriptions of the nature, scope, and objectives of the civil cooperative activity, provisions referred to cooperation, liability, intellectual property and the transfer of goods and technical data. An important rule relates to compliance with legal obligations applicable to each signatory, which means the Accords prescribe liability for breaching international law. Any activity of signatories should be carried out for peaceful purposes and in accordance with relevant international law.

The Artemis Accords contain an interesting provision which is very similar to the Moon Treaty. It states that signatories should act in transparency and they should inform each other about theirs space activities, but also about national space policies. There are also provisions under which signatories plan to share scientific results of their activities with the public and the scientific community. This is an interesting section, in line with *corpus iuris spatialis*, but it may lead to conflicts relating to the sharing of knowledge obtained by states. It is possible in the case of common, limited activity, but it is not possible under a universal agreement. This is comparable to the section devoted to the development of interoperability and common exploration of infrastructure and standards, which is important for coopera-

[49] R. Neef, *Artemis Accords: A New Path Forward For Space Lawmaking?*, 'Adelaide Law Review' 2021, No. 42(2), p. 576.

tion of entities.[50] Section 5 enumerates materials, systems and installations which should be used commonly by signatories, but this list is not exhaustive. The Artemis Accords encourage states to establish proper standards if there are no proper regulations in place already. The Signatories to this agreement retain the right to communicate about their activities and they intend to coordinate with each other their information policy with regard to protection of information. The agreement stipulates open sharing of data and information obtained during joint space activities. What is important, private sector operations are excluded from this provision if provided they are not conducted on behalf of states.

The Artemis Accords repeat provisions of the Rescue and Return Agreement and the Registration Convention. It is important to note that there is an obligation of registration of relevant space objects which may lead to misunderstandings in interpretation of the agreement. "Relevant" may mean that not every object should be registered. There is also a provision on the protection of heritage, which should be done by using applicable practices and rules.

Section 10 of the Artemis Accords deals with space resources. This provision may be unclear, because first of all it emphasizes that utilization of space resources should be used to provide critical support for safe and sustainable operations. This sentence poses the question about the use of space resources for purposes other than operations in space. These doubts are strengthened by subsequent provisions, which emphasize compliance of extraction and utilization of space resources with the Outer Space Treaty and the use of resources for needs of space activities. It is reserved though that extraction of resources does not constitute national appropriation. To do so, extraction of resources should be notified to the Secretary-General of the United Nations and to the public and the international scientific community. It is also contrary to the obligation to establish a special regime for extracting space resources.[51]

The Artemis Accords contain an important and very broad Section 11. This is a provision which addresses security and safety in outer space and avoiding harmful interference. It highlights the duty of authorization of space activities by the state, which may involve a request for consultation in case of harmful interference or threat of it. The signatories state that they shall refrain from harmful actions and they will inform in case of harmful interference or hazards to other states. An interesting provision lays down safety zones, which are described as areas where nominal operations of a relevant activity or an anomalous event could reasonably cause harmful interference. Section 10 also provides general demands for establishing safety zones. Establishment, alteration, or end of any safety zone should be

[50] M. de Zwart, *To the Moon and Beyond: The Artemis Accords and the Evolution of Space Law,* (in:) M. de Zwart, S. Henderson (eds), *Commercial and Military Uses of Outer Space*, Springer 2001, p. 72.

[51] C. Finnegan, *Indigenous Interests in Outer Space: Addressing the Conflict of Increasing Satellite Numbers with Indigenous Astronomy Practices,* 'Laws' 2022, No. 11(26), p. 5.

notified to Secretary-General of the United Nations. Safety zones should be made available for the public and signatories should take any appropriate measures to ensure safety for the personnel, equipment and operations. The last point of the section talks about the purpose of safety zones. This can be controversial, because there is a chance they will be used not only for scientific discovery and technology demonstration, but also for the safe and efficient extraction and utilization of space resources. Even limitation of the use of space resources to support sustainable space exploration and other operations cannot be recognized as the possibility to extract space resources on a large scale. The existence of safety zones is not an obstacle to the principle of free access to all areas of celestial bodies, but it still can be recognized as an attempt of appropriation, which is contrary to the Outer Space Treaty.[52]

The Artemis Accords are an important agreement from one more point of view. Section 12 addresses orbital debris, which poses a danger not only to the environment, but also to human activities in space. Signatories express their intention to mitigate the amount of space debris, including to remove spacecraft. Another important provision lays down the responsibility of a state which plans and implements the end of mission in the case of cooperative missions.

8. CONCLUSION

The Artemis Accords are not a binding agreement adopted by a few states. In fact, there are about 20 signatories to it, which is why it cannot be recognized as a universal act such as the treaties adopted during the Cold War. Apart from political aspects, the Artemis Accords touch upon controversial issues such as extraction of space resources, which is recognized as violation of international law, despite there being a provision on compliance with the Outer Space Treaty. It also crucial that this is the only agreement invoked in the provisions of the Artemis Accords. When it comes to responsibility and liability of states, there are many provisions on the possibilities of sharing information and informing about threats. This is another problematic question, because it is not possible to encourage the majority of states to exchange scientific data which are an effect of high-level research. Controversies can also be expressed in the subject of safety zones. This is a notion not recognized in binding international law.

Given these doubts, it does not seem that the Artemis Accords will ever be part of international law. It may provide a legal ground for an activity of a few states in their common goal, but it is not a collection of principles for space activities.

[52] J. Lee, E. Magilton, A. Ruffolo, *Diplomatic Impact in the Stars? A Review of the Impact of the Artemis Accords on Global Relationships,* 'Catholic University Journal of Law and Technology' 2022, Vol. 30(2), p. 21.

REFERENCES:

Abeyratne R., *Space Security Law*, Berlin/Heidelberg 2011

Byrd L., *Soft Law in Space: A Legal Framework for Extraterrestrial Mining*, 'Emory Law Journal' 2022, Vol. 71(801)

Cheney T., *There's No Rush: Developing a Legal Framework for Space Resource Activities*, 'Journal of Space Law' 2019, No. 43

Dempsey P., *Overview of the United States Space Policy and Law*, (in:) R. Jakhu (ed.), *National Regulation of Space Activities*, New York 2010

Deplano R., *The Artemis Accords: Evolution or Revolution in International Space Law?*, 'International and Comparative Law Quarterly' 2021, Vol. 70

Dunk F. von der, *Asteroid Mining: International and National Legal Aspects*, 'Michigan State International Law Review' 2017, Vol. 26(1)

Finnegan C., *Indigenous Interests in Outer Space: Addressing the Conflict of Increasing Satellite Numbers with Indigenous Astronomy Practices*, 'Laws' 2022, No. 11(26)

Franckx E., *The International Seabed Authority and the Common Heritage of Mankind: The Need for States to Establish the Outer Limits of their Continental Shelf*, 'The International Journal of Marine and Coastal Law' 2010, No. 25

Ochman A., *Misja Artemis 1: Ostatni rozdział, czyli powrót do domu,* Nauka to Lubię, 11.12.2022, https://naukatolubie.pl/misja-artemis-1-ostatni-rozdzial-czyli-powrot-do-domu/ (accessed 10.07.2023)

Matacz M., *W górnictwie kosmicznym czekają gigantyczne pieniądze*, Nauka w Polsce, 22.09.2020, https://naukawpolsce.pl/aktualnosci/news%2C83920%2Cw-gornictwie-kosmicznym-czekaja-gigantyczne-pieniadze.html (accessed 10.07.2023)

Krajczyńska E., *Dr Anna Łosiak: księżycowe próbki dadzą wgląd w najdalszą historię naszej planet,* Nauka w Polsce, 29.08.2022, https://naukawpolsce.pl/aktualnosci/news%2C93469%2Cdr-anna-losiak-ksiezycowe-probki-dadza-wglad-w-najdalsza-historie-naszej (accessed 10.07.2023)

Jones A., *China Launches Space Mining Test Spacecraft on Commercial Rideshare Mission*, SpaceNews, 27.04.2021, https://spacenews.com/china-launches-space-mining-test-spacecraft-on-commercial-rideshare-mission/ (accessed 10.07.2023)

Warner C., *International Partners Advance Cooperation with First Signings of Artemis Accords*, NASA, 13.10.2020, https://www.nasa.gov/press-release/nasa-international-partners-advance-cooperation-with-first-signings-of-artemis-accords (accessed 10.07.2023)

Kramer K., *Neil deGrasse Tyson Says Space Ventures Will Spawn First Trillionaire. A passion for Exploration is the Fuel to an Innovative Economy, Says Astrophysicist Neil deGrasse Tyson*, NBCNEWS, 05.05.2015, https://www.nbcnews.com/science/space/neil-degrasse-tyson-says-space-ventures-will-spawn-first-trillionaire-n352271 (accessed 10.07.2023)

Wall M., *Asteroid Mining Venture Backed by Google Execs, James Cameron Unveiled*, space.com, 24.04.2012, https://www.space.com/15395-asteroid-mining-planetary-resources.html (accessed 10.07.2023)

Kamalnath A., Sarkar H., *Regulation of Corporate Activity in the Space Sector*, 'Santa Clara Law Review' 2022, Vol. 62

Larsen P., *Is There a Legal Path to Commercial Mining on the Moon?*, 'University of Pittsburgh Law Review' 2021, Vol. 83

Lee J., Magilton E., Ruffolo A., *Diplomatic Impact in the Stars? A Review of the Impact of the Artemis Accords on Global Relationships*, 'Catholic University Journal of Law and Technology' 2022, Vol. 30(2)

Lee R., *Law and Regulation of Commercial Mining of Minerals in Outer Space*, Dordrecht/Heidelberg/London/New York 2012

Lyall F., Larsen P., *Space Law: a Treatise*, Burlington 2009

Man P. de, *Working Paper No. 189. Luxembourg Law on Space Resources Rests on Contentious Relationship with International Framework,* July 2017, https://ghum.kuleuven.be/ggs/publications/working_papers/2017/189deman (accessed 21.01.2023)

Neef R., *Artemis Accords: A New Path Forward For Space Lawmaking?*, 'Adelaide Law Review' 2021, 42(2)

Nugraha T., *Space-Centric Concept to Answer Tomorrow Space Challenge: A Small Step for Future Space Law*, 'Diponegoro Law Review' 2021, Vol. 6(2)

Oliveira Bittencourt Neto O. de, *Defining the Limits of Outer Space for Regulatory Purposes*, Heidelberg 2015

Pardo A, *Address to the 22nd Session of the General Assembly of the United Nations*, U.N. GAOR, 22nd sess., U.N. Doc. A/6695 (18 August 1967)

Piotrowski M., Zaręba S., *Artemis Accords: Towards New Rules for the Exploitation of Space*, 'The Polish Institute of International Affairs Bulletin' 4 March 2021, No. 47(1743)

Pop V., *Who Owns the Moon? Extraterrestrial Aspects of Land and Mineral Resources Ownership*, Berlin/Heidelberg, 2009

Schmidt Y., *International Space Law and Developing Countries*, (in:) Ch. Brunner, A. Soucek (eds), *Outer Space in Society, Politics and Law*, Vienna 2011

Skardzińska B., *Górnictwo kosmiczne – prawo i perspektywy*, (in:) K. Myszona-Kostrzewa, E. Mreńca, P. Zientarski (eds), *Prawne aspekty działalności kosmicznej*, Warsaw 2019

Taichman E., *The Artemis Accords: Employing Space Diplomacy to De-Escalate a National Security Threat and Promote Space Commercialization*, 'American University National Security Law Brief' 2021, Vol. 11(2)

Tronchetti F., *Fundamentals of Space Law and Policy*, New York/Heidelberg/Dordrecht/London 2013

Viikari L., *The Environmental Element in Space Law Assessing the Present and Charting the Future*, Leiden/Boston 2008

Zwart M. de, Stephens D., *The Space (Innovation) Race: The Inevitable Relationship Between Military Technology And Innovation*, 'Melbourne Journal of International Law' 2019, Vol. 20

Zwart M. de, *To the Moon and Beyond: The Artemis Accords and the Evolution of Space Law*, (in:) M. de Zwart, S. Henderson (eds), *Commercial and Military Uses of Outer Space*, Springer 2001

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SUSTAINABILITY OF SPACE TRAFFIC MANAGEMENT – ADDRESSING THE ISSUE OF ORBITAL DEBRIS IN THE CONTEXT OF SPACE LIABILITY

Abstract

The problem of managing space debris is not only an international challenge but also an opportunity to preserve this environment for future space exploration missions. As more countries gain the technology and economic means to launch spacecraft, more focus is being exerted on standardizing the procedures of each country and on adhering to new developing norms under international agreements.

Over time, the increasing number of launching states proves that space debris mitigation will have to be coordinated and that preventive measures across all stakeholders – both state and non-state actors – will have to be put in place since if one actor fails to do so, this may inevitably affect all others. The article focuses on the analysis of international space law and policy steps undertaken to tackle environmental pollution in outer space, in particular in terms of accumulation of human-made debris and waste material in the Earth's orbit and beyond.

The aim of the work is to analyse to what extent the international legal framework and policy measures are failing in addressing the emerging issue of debris in outer space and to propose policy recommendations in creating a new specialized international organization along with *de lege ferenda* conclusions for international space law, especially in the context of possible amendments to the Liability Convention and the Outer Space Treaty.

KEYWORDS

pace debris, space traffic management, space liability

SŁOWA KLUCZOWE

odpady kosmiczne, zrównoważony rozwój przestrzeni kosmicznej, szkody wyrządzone w przestrzeni kosmicznej

1. INTRODUCTION

During the Cold War, only two major actors engaged in the space race, which began in 1957 with the launch of the first artificial satellite Sputnik 1. At the time, the USA and the USSR strived to make major technical and scientific advances in space from both a technological and a legal perspective. The situation today is notably different.

Firstly, the new space market does not support an ideological race. It focuses on the actual commercialization of outer space by states and private companies amidst the omnipresent need for constant telecommunications, GPS services, or even the desire for commercial space travel.[1] Secondly, not only has the space market become occupied by two major space powers, but it has encouraged new players, including China, India, and Japan, and Member States of the European Space Agency. If we consider the European Union as one launching state, then the number of countries engaged in the space industry amounts to twelve launching States.[2] The rapid development of space activities implies exponential utilization and exploitation of outer space by the parties involved. Therefore, the international community will be obliged to regulate and sanction space traffic management to maintain sustainable development and peaceful exploitation of outer space.

Over time, the increasing number of launching states proves that space debris mitigation measures will have to be coordinated across all above-mentioned stakeholders, since if one fails to do so it may inevitably affect all others. Furthermore, space activity generates and accumulates debris in orbit faster than any natural

[1] ESA's Annual Space Environmental Report, ESA Space Debris Office, European Space Agency, April 2022, pp. 50, https://www.sdo.esoc.esa.int/environment_report/Space_Environment_Report_latest.pdf (accessed 13.04.2023).

[2] P. Van Fenema, *Chapter 7. Legal Aspects of Launch Services and Space Transportation*, (in:) F. Von Der Dun, F. Tronchetti (eds), *Handbook of Space Law,* Cheltenham/Northampton 2015, pp. 409.

processes are able to remove it.[3] Although the future of space debris cannot be predicted with certainty, it is reasonable to assume that the rapidly changing space traffic landscape will contribute to its further accumulation. Even if the fragmentation of space debris can be eliminated to a certain extent, collisions of objects could become a much larger player in debris generation while the rise of technology and commercial space travel will generate heavier space traffic in the Lower Earth Orbit (LEO). Thus, even though the international community will aim to enforce space debris mitigation policies while constructing new rockets and satellites, questions of international responsibility and liability mechanisms (e.g., in the context of accidental collisions) in space may be on the rise in the coming decades.

2. THE SCOPE OF THE PROBLEM

Environmental pollution in outer space generally refers to the accumulation of human-made debris and waste materials in the Earth's orbit and beyond. This pollution includes items such as spent rocket stages, defunct satellites, and other debris generated by space activities. As there is no universal legal definition of space debris, scholars tend to use the working definition established by the Inter-Agency Space Debris Coordination Committee (IADC), which describes space debris as *all man-made objects including fragments and elements thereof, in Earth orbit or re-entering the atmosphere, that are non-functional*.[4] Examples may include derelict spacecraft and upper stages of launch vehicles; defunct satellites; fragments from explosions, collisions, or intentional destruction of objects in space; and other tools or objects lost during spacewalks or other activities. As space debris can range in size – from tiny paint flecks or gloves to large components of rockets – they all may pose a significant threat to operational spacecraft and satellites, as they can cause damage upon impact. Moreover, space debris that orbits Earth can move very fast, calculated at 18 000 miles per hour on average.[5] As a result, its exponential growth and dynamic movement threaten the sustainability of outer space and the safety of space-based services, explorations, and further operations by posing a serious risk to both people and property in space and on Earth.[6]

[3] IADC Space Debris Mitigation Guidelines, Inter-Agency Space Debris Coordination Committee (IADC) Steering Group, IADC-02-0, March 2020, pp. 6, https://orbitaldebris.jsc.nasa.gov/library/iadc-space-debris-guidelines-revision-2.pdf (accessed 13.04.2023).

[4] ARES, *Frequently Asked Questions*, https://orbitaldebris.jsc.nasa.gov/faq/# (accessed 07.07.2023).

[5] J.C. Liou, *Highlights of Recent Research Activities at the NASA Orbital Debris Program Office*, Paper presented at the 7th European Conference on Space Debris, Germany, April 2017, Report No. JSC-CN-3199.

[6] S.J. Garber, *Incentives for Keeping Space Clean: Orbital Debris and Mitigation Waivers*, 'Journal of Space Law' 2017, No. 41(2), pp. 179-180.

In fact, low Earth orbit (LEO) is now viewed as the World's largest garbage graveyard. To put this phenomenon into perspective, the amount of waste material orbiting LEO was approximately 9,000 metric tons as of January 2022,[7] with over 10,000 objects in a size of 10 cm or larger.[8] There are many reasons and examples of human activities, which explain why LEO has become an orbital graveyard. One of the most notable historical events includes the intentional breakup of the Chinese Fengyun-1C spacecraft in 2007, which caused the most severe artificial debris in Earth's orbit since the very beginning of space exploration.[9] Still, before the Fengyuan-1C, accidental explosions – including the explosion of the Soviet Cosmos 1275 or the United States Nimbus 4 rocket body (1970-025C) – dominated as sources of long-lived debris.[10] The afore-mentioned incidents have increased LEO's large orbital debris quantity by 70%, posing more significant collision risks for spacecraft operating in low Earth orbit.[11] On top of that, some scientists argue that the exponential growth of space debris increases the potential threat of the Kessler effect, which is used to describe a scenario in which too high density of objects in LEO results in cascading collisions between objects, thus generating space debris that increases the likelihood of further collisions.[12]

All in all, the aim of this article is to examine the current state of international legislation, analyse policy measures and identify legal gaps in addressing the space debris mitigation regime. As a result, the work will propose possible recommendations and *de lege ferenda* conclusions for regulators in designing effectively sustainable management of space traffic in the future.

3. CURRENT STATE OF AFFAIRS

3.1. POLICY DIRECTIONS

On the national level, one way to respond to this alarming problem was to launch the NASA Orbital Debris Program in 1979 in the Space Sciences Branch at the Johnson Space Center (JSC) in Houston, Texas. The program aims to explore possibilities to produce fewer orbital debris and design equipment to track and

[7] ARES, *op. cit.*

[8] NTSS, *Handbook for Limiting Orbital Debris*, July 2008, pp. 26, www.standards. nasa.gov/sites/default/files/standards/NASA/Baseline/1/nasa-hdbk-871914_baseline_with_change_1.pdf (accessed 13.04.2023).

[9] *Ibid*., p. 27.

[10] *Ibid*., p. 28.

[11] *Ibid*., pp. 29-30.

[12] D.J. Kessler, B.G. Cour-Palais, *Collision Frequency of Artificial Satellites: The Creation of a Debris Belt*, 'Journal of Geophysical Research' 1978, No. 83, pp. 2640–2641.

remove the debris already in space. As a result of the Orbital Debris Program, NASA was able to develop some general standards, policies, and procedural requirements, including a Handbook for Limiting Orbital Debris.[13]

On the horizontal level, among the critical international efforts to understand and mitigate the current issue we have the "Space Debris Mitigation Guidelines" developed by the Inter-Agency Space Debris Coordination Committee (hereinafter IADC) in 2002. The IADC is an intergovernmental forum for the worldwide coordination of activities and technical issues related to man-made and natural debris in space.[14] The guidelines have served a role of preventive practices designed to control the increase of space congestion in popular orbital regions such as LEO to preserve their scientific and commercial value and the possibility of space exploitation for peaceful purposes for future users.[15]

Based on the developed policy guidelines, the United Nations (UN) General Assembly has endorsed them in its Resolution 62/217 of 22 December 2007 by underlying global mitigation standards with seven guiding principles. These include minimization of debris released during normal operations; limitation of potential break-ups during operational phases and post-missions resulting from stored energy; probability of accidental collision in orbit; avoidance of intentional destruction and other harmful activities; and finally, recommendations on limiting the long-term presence of spacecraft and launch vehicle orbital stages in the LEO region and or Earth orbit region after the end of the mission.[16] From a technical point of view, the guidelines apply to mission planning and the operation of newly designed spacecraft and, if possible, to implementation in existing ones.[17]

Lastly, the Committee on the Peaceful Uses of Outer Space (COPUOS) updated a Compendium of space debris mitigation standards in March 2023, which does not only provide guiding principles but also – based on the universal templates – compiles current instruments, best practices, and measures that States and international organizations have implemented.[18] As a result, the Compendium remains one of the most important sources and handbooks providing up-to-date knowledge and recommended solutions on space debris mitigation mechanisms. For example, it enumerates procedures chosen by the European

[13] NTSS, 2008, *op. cit.*

[14] UNOOSA, *Space Debris Mitigation Guidelines of the United Nations Committee on the Peaceful Uses of Outer Space*, Inter-Agency Space Debris Coordination Committee, A/AC.105/C.1/L.260, 2007, pp. 1, https://www.unoosa.org/pdf/publications/st_space_49E.pdf (accessed 13.04.2023).

[15] *Ibid.*, p. 2.

[16] *Ibid.*, p. 3.

[17] United Nations Committee on the Peaceful Uses of Outer Space, *Compendium: Space Debris Mitigation Standards adopted by States and International Organizations*, A/AC.105/C.2/2022/CRP.17, March 2023, pp. 91, https://www.unoosa.org/documents/pdf/spacelaw/sd/Space_Debris_Compendium_COPUOS_20_March_2023.pdf (accessed 13.04.2023).

[18] *Ibid.*

Code of Conduct for Space Debris Mitigation,[19] consistent with Space Debris Mitigation Guidelines. In addition, however, it provides much more technical details and explanations of enlisted guidelines. Interestingly, from the legal perspective, it also directly references Articles I and IX of the Outer Space Treaty of 1967 and the Liability Convention of 1972.[20] Moreover, in the Nicaraguan contribution to the Compendium the government noted that although it does not have a specific law on instruments relating to space debris mitigation, it expresses its devotion to the cause by noting the example of the Liability Convention, which was adopted by the government in 2017.[21]

It shall be noted that the guidelines in question aim only at encouraging international adoption of voluntary debris mitigation measures, which are not legally binding and, therefore, cannot enforce their applicability to States at the international level. Still, the example of the Nicaraguan statement or the European Code of Conduct may be perceived as a subjective element of *opinio iuris* that could also support the crystallization of the customary law in the international legal framework. Thus, the role of the guidelines and compendiums referred to above may not only lie in raising awareness of good practices but could also show what the State "thinks" about its legal obligation towards space debris mitigation measures.

3.2. LEGAL FRAMEWORK

3.2.1. MITIGATION AND PREVENTION OBLIGATION

To begin with, it should be underlined that the current space treaties do not define, address or imply a direct reference toward space debris.[22] The only indirect connection that might be considered relies on Article IX of the Outer Space Treaty, which obliges all State Parties to conduct all their activities in outer space with "due regard to the corresponding interests of all other States Parties" to the Treaty. Furthermore, any exploration of outer space shall avoid its "harmful contamination" and "adverse changes in the environment of the Earth," which

[19] The Code was developed and adopted in cooperation with Italian, British, French, German, and the European space agencies.

[20] European Space Agency, *European Code of Conduct for Space Debris Mitigation*, ESA/IRC(2004)20, June 2004, https://www.unoosa.org/documents/pdf/spacelaw/sd/2004-B5-10.pdf (accessed 13.04.2023).

[21] *Ibid*., p. 59.

[22] These include Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies; Agreement on the Rescue of Astronauts, the Return of Astronauts and Return of Objects Launched into Outer Space; Convention on International Liability for Damage Caused by Space Objects; Convention on Registration of Objects Launched into Outer Space and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.

resulted from "the introduction of extra-terrestrial matter".[23] The passage also indicates that States should consult with other States beforehand in case of engaging in activities that might cause "harmful interference" with the activities of other States. Moreover, any State Party has the right to request consultations if it considers that activities of another State(s) might cause harmful interference.[24]

Article IX undoubtedly creates a treaty obligation upon State Parties to take reasonable measures and accurate procedural steps while conducting any space activity by assessing any interference with the interests of other States or possible causation of harmful contamination. It also lays down a duty and a right to consult such activities between relevant stakeholders. This reasoning may imply that if a State creates debris during its activities in outer space, then it may cause interference with other States' interests or it may even face an allegation of harmful contamination.

Nevertheless, international law does not prohibit States from creating debris while performing their activities. As outer space "shall be free for exploration and use by all States,"[25] any state can use this privilege – based also on the *Lotus* presumption – and justify its actions with its national interests while creating debris as a side effect, which is not prohibited by international law. As the quoted treaty language needs a definitional setting for space debris, it is also impossible to assess the amount of debris that could result in a too high degree of possible interest interference or harmful contamination, thus breaching the before-mentioned obligation. Likewise, it would be difficult to put any allegations or salvage procedures against a debris-producer given the discrepancies between space debris, property, and remedial mechanisms.

The said issues lead to the question of enforcing such vague treaty obligations. In the context of space debris, Article IX encourages States to limit its generation without specifying any definitional or procedural scope. As a result, there is little chance a State would ever be held internationally liable for violating Article IX based on activities that create orbital debris in any ordinary manner. Apart from this provision, the international legislative process has not scrutinized space traffic management except for a few non-binding policy documents illustrated above.

[23] Treaty Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 27 January 1967, RES 2222 (XXI), (hereinafter: Outer Space Treaty).

[24] *Ibid.*

[25] *Ibid.*, Article 1.

3.2.2. THE ROLE OF RESPONSIBILITY AND LIABILITY RULES

The United Nations Register of Objects Launched into Outer Space[26] and its implementation was established as a consequence of the Convention on Registration of Objects Launched into Outer Space.[27] State Parties to the treaty must establish their own national registries and provide information on their space objects, thus ensure transparency on space operations. Furthermore, exemplifying Articles VI, VII, and VIII of the Outer Space Treaty is needed to understand the legal framework of all objects and their ownership in outer space. Article VI prescribes international responsibility of States for their national activities in outer space, which include both activities carried on by governmental agencies and by non-governmental entities.[28] As mentioned before, in the past – when the Outer Space Treaty came into force – private commercial activity in space was virtually non-existent.[29] The situation started to change in the 1990s and now varies significantly as civil and commercial entities perform a substantial portion of space activity.[30] Still, as the legal framework has not changed and States bear international responsibility for governmental and non-governmental enterprises, private entities require authorization and continuing supervision by the appropriate State Party to the Treaty in all their space activities.[31] Thus, based on the interpretation of Article VI, States are directly responsible to other States for any possible consequences of orbital debris generated by non-governmental entities.

Furthermore, Article VII of the Outer Space Treaty addresses liability of States. It includes several concepts relevant to orbital debris and different categories of "launching States," whereby it is vital that they are analysed step by step. Article VII states:

> " Each State Party to the Treaty that launches or procures the launching of an object into outer space […], and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air or in outer space, including the moon and other celestial bodies."[32]

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[26] See United Nations Register of Objects Launched into Outer Space, United Nations Office for Outer Space Affairs, official website: http://www.unoosa.org/oosa/en/spaceobjectregister/index.html (accessed 13.04.2023).

[27] Convention on Registration of Objects Launched into Outer Space, 12 November 1974, RES 3235 (XXIX), (hereinafter: Registration Convention).

[28] Outer Space Treaty, Article VI.

[29] B. Cheng, *Studies in International Space Law,* Oxford 1997, p. 607.

[30] ESA's Annual Space Environmental Report, 2022, *op. cit*., p. 50.

[31] *Ibid.*

[32] Outer Space Treaty, Article VII.

As mentioned beforehand, Article VII enumerates possible facets of a "launching State" – demonstrated in Article I of the Liability Convention[33] and Article I of the Registration Convention – in four different dimensions:

1. a State that launches a "space object";
2. a State that procures the launching of a space object;
3. a State from whose territory a space object is launched;
4. a State from whose facility a space object is launched.

Consequently, as different States may be defined as launching States simultaneously, multiple States may be jointly liable for the damage. This damage may be caused by space debris resulting from the collision of space objects caused in outer space, on Earth, or in the atmosphere.

Thus, the Liability Convention is a critical source of treaty law – especially regarding analysis of the space debris concept – that defines and clarifies the liability regime established by Article VII of the Outer Space Treaty. First and foremost, it defines "damage" as the "loss of life, personal injury or other impairment of health; or loss of or damage to property of States or persons, natural or juridical, or property of international intergovernmental organizations".[34] In the next two articles the Convention establishes two distinct regimes of liability that depend on (1) the location where the damage occurred and (2) the type of object that was damaged. First, the absolute liability of a launching State to pay compensation occurs for damage caused by its space object on the earth's surface or to aircraft in flight.[35] The second branch refers to a fault-based system in which a launching State is liable only if the damage is due to its fault or the fault of persons for whom it is responsible when the damage occurred elsewhere than on the earth's surface.[36]

Last but not least, Article VIII of the Outer Space Treaty declares that a "State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object […] while in outer space […]." It further explains that ownership of objects launched in outer space is not affected by their presence in outer space, on a celestial body, or by their return to Earth.[37] Together with Article II of the Registration Convention, these provisions explain that only one State (and in case of multiple States, then always one of the launching States) will have jurisdiction and control over space objects it launched.

[33] Convention on the International Liability for Damage Caused by Space Objects, Res. 2777 (XXVI), 29 March 1972 (hereinafter: Liability Convention). In Article I (c), the launching State is defined as a State which launches or procures the launching of a space object as well as a State from whose territory or facility a space object is launched.

[34] Liability Convention, Article I(a).

[35] Liability Convention, Article II.

[36] Liability Convention, Article III.

[37] Liability Convention, Article VIII.

In fact, as most scholars ultimately agree, every object launched into space has the potential to become debris.[38] As exemplified before, the Outer Space Treaty and the Liability Convention make a State liable for damage caused by any "object or its component parts" launched into outer space.[39] Thus, whether it relates to non-functional payloads (e.g. satellite running out of fuel) or any other type of small object launched into outer space, it must be considered a space object that might become space debris. Consequently, the provisions mentioned above – of the Liability Convention, the Outer Space Treaty, and the Registration Convention – govern the consequence of possible liability of orbital debris.[40] It must be noted, though, that these regulations do not provide any guidance on definitional scope of how and when a space object may be interpreted as a space debris..

4. DISCUSSION – RECOMMENDATIONS AND PROPOSALS FOR CHANGE

4.1. CREATION OF A SPECIALIZED INTERNATIONAL TREATY WITH A CONSULTATIVE FORUM

In order to introduce any enforcement mechanisms that would not discourage State Parties of the Outer Space Treaty and Liability Convention, rather than introducing a sanctioning system, a specialized international organization with a flexible instrument of a consultative forum could be a practical solution to this emerging global problem. This platform could be a source of possible financial incentives and funding opportunities, an instrument for transferring knowledge with a repository of good practices, and a creative lab with innovative technological solutions. Furthermore, by introducing an international treaty, which would constitute an international organization, it would be possible to integrate all soft laws and policies discussed above in comprehensive and binding space law. This regime, based on existing international environmental law principles and the existence of an international obligation to cooperate to ensure sustainable development of outer space activities, would be able to offer legal and technical solutions and dispute resolution mechanisms.

[38] See e.g., H.A. Baker, *Space Debris: Legal and Policy Implications*, Dordrecht 1989.

[39] Outer Space Treaty, Article VII; Liability Convention, Articles I-III.

[40] Some scholars do not agree with conclusions that space debris is governed by existing liability rules. See e.g., C.D. Williams, *Space: The Cluttered Frontier*", 'Journal of Air Law and Commerce' 1995, No. 60(4), p. 1147.

4.2. INTRODUCING BINDING LEGAL INSTRUMENTS

Based on the analysis of the legal framework presented above, the primary issue in the sustainability of space traffic is the need for a binding and comprehensive international law to provide norms on space debris removal and prevention. In a nutshell, a revision of international space treaty law should consider, among other concepts, a legal definition of space debris (that differentiates between space objects and space debris), technical solutions for a regime on the removal and prevention of space debris, space traffic management, a clear notion of fault, negligence, and causation as well as the application of environmental law principles in space. Notably, interpretative manuals or guiding interpretations should be established to explain the volume of debris caused by State(s)' activity that can constitute harmful the contamination illustrated in Article IX.

Firstly, one of the main starting points would be establishing a standard legal definition of space debris, which will be essential to any effective remediation regime. The reason is that without such a definition, it will be impossible to implement salvage rights in outer space as neither the Outer Space Treaty nor the Registration Convention recognizes these rights. Thus, a space object remains the property of its launching state – even if in no further use – and it is illegal to move such objects without prior permission from that state. By establishing a legal working definition of space debris, as a derivative from Article IX of the Outer Space Treaty, it would be possible to differentiate between a space object[41] and space debris. As overlapping between these definitions is inevitable, the distinction between space objects and space debris should focus on evolving a remediation regime to establish more accessible procedures for debris remediation in outer space.[42]

4.3. LEGAL AND TECHNICAL MEASURES

When it comes to possible legal measures, there are two main options available. The first proposal, rendered more radical, would include a total deletion of the

[41] The term "space object" is not used in the Outer Space Treaty, but it appears in the Liability Convention, the Registration Convention, the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, RES 2345 (XXII), 22 April 1968 (hereinafter: Rescue Agreement), as well as the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, RES 34/68, 18 December 1979 (hereinafter: Moon Agreement). The treaties are inconsistent in terminology, the Liability Convention and Outer Space Treaty do not have any agreed legal definition, and the closest description of a space object appears in the Liability Convention in Article I, which notes "[t]he term 'space object' includes component parts of a space object as well as its launch vehicle and parts thereof."

[42] F. Haroun, S. Ajibabe, P. Oladimeji, J.K. Igbozurike, *Toward the Sustainability of Outer Space: Addressing the Issue of Space Debris*, 'New Space' 2021, No. 9(1), 2021, p. 66.

current space treaty law to construct a new comprehensive space treaty regime that would include all essential changes, such as orbital debris and commercial entities' engagement in space traffic management. Some States put forward this proposal during discussions in one of the COPUOS Legal Subcommittees, but other countries condemned this idea as neither necessary nor wise.[43] Secondly, legislators should consider improving the responsibility and liability regime under international space law. Here, legal terms of fault, negligence, and causation with respect to the Liability Convention in accordance with the current meaning of space traffic rules should be defined. Notably, the proposal could aim at broadening and modifying liability rules to also affect orbital debris and support the unification of private international law.[44] For example, some amendments could be introduced to the already-explained fault-based standard applicable to damage occurring in outer space. In addition, the modification could include a system in which a State would be presumed liable for damage caused by its space objects, but only if it failed to implement all necessary mitigation measures.[45]

Hence, international technical and legal standards should be enacted and regularly updated based on the work primarily expressed in the IADC Guidelines. The universal standardization should include the technical requirements of satellites and their operationalization, e.g. collision avoidance mechanisms and other possible procedures. In particular, mitigation regimes, efforts at tracking objects and debris, and guidelines for satellite specifications should be unified, like, for example, standards of the International Civil Aviation Organization.

4.4. DISPUTE RESOLUTION MECHANISMS

Furthermore, the vagueness of international space law, including treaty law, acquiesces the international community to refrain from reacting to possible negligence and cease taking necessary legal steps to mitigate and prevent the accumulation of debris in outer space. More distinctively, one major issue concerns the need to revise the dispute resolution mechanism under the Liability Convention. For example, Article XIX (2) of the Liability Convention illustrates that the decision can be final and binding if the parties have so agreed, and otherwise, its Commission shall render a final and recommendatory award, which the parties shall consider in good faith.[46]

[43] UN COPUOS, Report of the Legal Subcommittee on Its Forty-Fifth Session, A/AC.105/871, 2006, para. 45-48.

[44] D. Maniatis, *The Law Governing Liability for Damage Caused by Space Objects: From State Responsibility to Private Liability*, 'Annals of Air and Space Law' 1997, No. 22(1), pp. 399-400.

[45] J.P. Lampertius, *The Need for an Effective Liability Régime for Damage Caused by Debris in Outer Space*, 'Michigan Journal of International Law' 1992, No. 13(2), pp. 464.

[46] Liability Convention, Article XIX.

Thus, without the introduction of proper enforcement mechanisms and sanctioning tools, the management of space debris will not be effective. One of the possible solutions to overcome this issue would be to recommend some options of binding or non-binding procedures of the ILA Draft Convention on the Settlement of Disputes in Space for the disputing parties to use, with the ultimate goal of a compulsory third-party dispute settlement and to prescribe arbitration as the preferred subsidiary method, which is accessible to private parties who have become essential players in the current space industry.[47]

5. CONCLUSIONS

As the number of space activities and amount of debris generated grow exponentially, it is necessary to guarantee sustainable development of Outer Space and Earth's orbit, which does not only foster protection of human life in space but also sustains the development of space exploration and travel per se.

The current international legal regime regulating space activities needs to be updated as, in many ways, it is unable to address contemporary issues thrown up by new vital stakeholders, space traffic, and generation of space debris. The lack of a regulatory framework in space debris management may pose a severe risk to man's ability to travel and further commercialize outer space.

The utmost priority of the international space community would be to set strict legal rules against pollution damage and provide universal technical standards in order to organize outer space activities in a manner that preserves outer space and mitigates the creation of possible space debris. The accumulation of debris in space poses a risk not only to the protection of the space environment but also to the safety of manned missions and space objects. Embracing sustainable management policies is a necessity for the future of the space industry in order to support and ensure safety and a thriving market of innovative business enterprises.

Therefore, the legal definition of space debris and further explanations on liability, ownership, causation, and negligence should be clearly defined in the space context. Moreover, international policy changes should focus on introduction of co-financed traffic coordination mechanisms and affordable removal services, including technology development, missions, and embedded interface standards, which would reduce the cost and risk of removing space objects in case of failure. Otherwise, without legal instruments and policy developments at the inter-

[47] Arbitration of Disputes Regarding Space Activities, proceedings of the 36th Colloquium on the Law of Outer Space, IISL, October 1993, Graz, AIAA, 1994, pp. 137, 139.

national level, there will be no incentives for a greater collective action towards sustainable development of space activities.

As more countries and private corporations gain the technology and economic means to launch spacecraft, more focus should be exerted on standardizing and unifying debris mitigation procedures – both technical and legal – while adhering to international agreements.

As shown before, international involvement in the regulation-making process regarding space traffic management and space debris removal has been minimal and envisaged in a few non-binding documents. Adopting an international treaty on space debris removal and creating a dedicated international organization is a plausible option for policymakers and legislators. The main agenda of this body would be to coordinate activities harmonizing national rules and policies as well as developing space debris mitigation and clean-up plans that rely on a fund fed by financial grants supported proportionally by State Parties.

Thus, possible dispute resolution mechanisms in the form of consultations or judicial arbitration proceedings, under the supervision of the created international organization, would intend to assess the liability regime related to space debris.

Still, until significant difficulties with applying the legal liability regime to space debris are resolved, it will be impossible to launch any proceedings in this regard. Therefore, an update of international space law requires (1) the creation of a legal definition of space debris differentiated from space objects; (2) a test on proving causation between damage suffered by a standard space object and debris in orbit; (3) the establishment of a negligence regime; (4) procedures on the identification of the liable launching State; and lastly (5) construction of a mandatory international standard, from which it would be possible to assess the behaviour of a State concerned and determine whether or not this behaviour is at fault or negligent.

If issues of identity, negligence, and causation are not resolved, the Liability Convention will be ineffective in preventing debris accumulation and providing redress for damage caused by orbital debris.

REFERENCES

Baker H.A., *Space Debris: Legal and Policy Implications*, Dordrecht 1989

Cheng B., *Studies in International Space Law,* Oxford 1997

Garber S.J., *Incentives for Keeping Space Clean: Orbital Debris and Mitigation Waivers*, 'Journal of Space Law' 2017, No. 41(2)

Haroun F., Ajibabe S., Oladimeji P., Igbozurike J.K., *Toward the Sustainability of Outer Space: Addressing the Issue of Space Debris*, 'New Space' 2021, No. 9(1)

Kessler D.J., Cour-Palais B.G., *Collision Frequency of Artificial Satellites: The Creation of a Debris Belt*, 'Journal of Geophysical Research' 1978, No. 83

Lampertius J.P., *The Need for an Effective Liability Régime for Damage Caused by Debris in Outer Space*, 'Michigan Journal of International Law' 1992, No. 13(2)

Liou J.C., *Highlights of Recent Research Activities at the NASA Orbital Debris Program Office*, Paper presented at the 7th European Conference on Space Debris, Germany, April 2017, Report No. JSC-CN-3199.

Maniatis D., *The Law Governing Liability for Damage Caused by Space Objects: From State Responsibility to Private Liability*, 'Annals of Air and Space Law' 1997, No. 22(1)

Williams C.D., *Space: The Cluttered Frontier*, 'Journal of Air Law and Commerce' 1995, No. 60(4)

Van Fenema P., *Chapter 7. Legal Aspects of Launch Services and Space Transportation*, (in:) F. Von Der Dunk, F. Tronchetti (eds), *Handbook of Space Law,* Cheltenham/ Northampton 2015

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THE EUROPEAN INTERPARLIAMENTARY SPACE CONFERENCE – THE WAY TO INFLUENCE THE SPACE LAW AND POLICIES IN POLAND

Abstract

The article presents the European Interparliamentary Space Conference as an interesting and effective way to collaborate on space law. It shows the path that needs to be followed to join the European Interparliamentary Space Conference. The presentation of its activities is assessed in light of the space governance concept.

The European Interparliamentary Space Conference affects the creation of law by national parliaments and the legal regulations of European institutions working for space. It also affects law-making by the European Parliament and the European Commission. The article assesses the role of the European Interparliamentary Space Conference as an actor in the European space arena. It evaluates the ability of the EISC to determine a common strategy for Europe's space activity, the shape of its space policy, and the directions of the European space industry integration. The history of Poland in the EISC is presented, and the assessment of Polish activities in the forum is characterized. Conclusions underline that the EISC is a significant actor in the space sector in Europe. Moreover, Polish participation in the activities of the ESIC should be more visible, especially at the national level.

KEYWORDS

space governance, the European Interparliamentary Space Conference, space law

SŁOWA KLUCZOWE

zarządzanie przestrzenią kosmiczną, Europejska Międzyparlamentarna Konferencja Kosmiczna, prawo kosmiczne

1. INTRODUCTION

The Space Era beginning with the launch of the first satellite in October 1957 is continuing until now. It has permeated human activities related to space exploration, space technology, and many cultural aspects of our civilization.

The United States and the former Soviet Union invested tremendous resources to obtain results in space exploration. These space powers involved their state infrastructure to develop space-related activities. Therefore, the role of parliaments in the creation of this policy grew to be important. Soon it proved clear that space activity became a technology driver in many areas of daily life and other nations became space-faring too. These countries formed structures to support creation of space policy and commercial applications of space-based technologies. The space era has introduced not merely competition but also cooperation between the nations involved. National parliaments have become crucial actors in this policy.

As Oltrogge and Christensen state, "the space domain today is characterized by a broadening and increasingly diverse set of activities and actors. Developing effective legal and policy regimes for these activities requires the coordination of multiple different stakeholder groups and the identification of enhanced mechanisms for improving understanding between the private sector and the multilateral space governance".[1] To meet the need for improved communication in the space sector it is worth presenting the European Interparliamentary Space Conference (EISC) which plays "an important role as a hub for international, inter-regional cooperation".[2]

[1] D. Oltrogge, I. Christensen, *Space Governance in the New Space Era*, 'Journal of Space Safety Engineering' September 2020, Vol. 7(3), https://doi.org/10.1016/j.jsse.2020.06.003 (accessed 21.02.2023), p. 434.

[2] *Ibid*.

Even though the EISC was omitted in Balogh's presentation of the institutional aspect of space exploration[3], it fits the definition presented by this author as "regional governmental forums and organization or mechanism that involves entities that have close links to governments".[4] Its achievements through the years of its activities confirm that it is worth increasing its importance. Additionally, its specific structure, described below, raises its attractiveness, as Vent argues that "space has increasingly become a political issue." This shows that we need to build upon the area where we have already created regional political cooperation on space activity.[5]

2. EUROPEAN INTERPARLIAMENTARY SPACE CONFERENCE

The European Interparliamentary Space Conference[6] (EISC) is an entity to which national parliaments can submit their delegations. This is a proven and most frequently practiced form of permanent interparliamentary cooperation. The EISC was established in 1999 on the initiative of parliamentarians from four countries: France, Germany, Italy and Great Britain (and established its Charter in 1999).[7] The parliaments of Belgium and Spain joined the initiative the year after. Delegations of the parliaments reformulated the Charter in 2006 (now known as EISC Charter 2006).

Currently, Austria, Belgium, the Czech Republic, Estonia, France, Spain, Luxembourg, Germany, Norway, Poland, Romania, Great Britain, and Italy are its permanent members.[8,9] I can also add that the Polish delegation, during the 2022 Plenary Conference in Paris, submitted an application to initiate the procedure of admitting Ukraine to the Conference with its status of associate member.[10] The application was accepted, and thus the procedure was started.

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[3] W. Balogh, *Institutional Aspects*, (in:) Ch. Brunner, A. Soucek (eds), *Outer Space in Society, Politics and Law*, Vienna 2011, p. 208.

[4] *Ibid*.

[5] C. Vent, *The Political Dimension*, (in:) Ch. Brunner, A. Soucek (eds) *Outer Space in Society, Politics and Law*, Vienna 2011, p. 73.

[6] https://eisc-europa.eu (accessed 21.02.2023).

[7] *Ibid*.

[8] *Ibid*.

[9] The Sejm of the Republic of Poland, Parliamentary Delegation – Space Group, https://www.sejm.gov.pl/SQL2.nsf/skladdelinna?OpenAgent&61&PL (accessed 21.02.2023).

[10] Proceedings of ESIC 2022, https://eisc-europa.eu/wp-content/uploads/2022/10/EISC-2022-Proceedings-EN.pdf (accessed 21.02.2023).

The EISC is headed by the state that holds the presidency in a given year. The presidency is rotary. However, which state will head the EISC is decided upon by the permanent members' vote during the Plenary Conference.

In terms of content, organization and technology, the EISC supports the European Space Policy Institute in Vienna. The role of the European Space Agency (ESA) should not be downplayed either.[11]

The Conference is open to all European countries that meet the specific requirements set out in the Charter 2006 of the European Interparliamentary Space Conference.[12] Admittedly, it is necessary to obtain an approval of the majority of the permanent members of the EISC in a voting at a plenary meeting of the Conference, but, as practice shows, after meeting the formal requirements, including a positive acceptance of the presentation of a given state, and submission of an appropriate request by the chairman of a given parliament, it is a formality.[13] A state may have the status of a permanent Conference member; an associate member; or an observer.[14]

A parliament wishing to participate in the EISC as a member must have a body that deals with space activity. Most often, these are National Parliamentary Space Groups. The group members represent a given parliament in the EISC and participate in all the activities of the Conference. The National Parliamentary Space Groups respond to proposed resolutions and presented opinions and programs related to the activities of the ESIC. Moreover, the ESIC National Groups, within the competence of the parliament, participate in the space activity in which a given country is involved. This is also the case with Poland. The Polish Parliamentary Space Group currently consists of 51 members of parliament and operates at the International Affairs Office of the Sejm of the Republic of Poland.[15,16] Permanent membership may only be held by a state which is a member of the European Union or the European Space Agency.[17] The presiding state organizes and sets work directions in a given year. It also proposes program topics for debate.

The main form of EISC activity is the Conference organized in the autumn each year. In addition to the members, representatives of the European Commission, the European Space Agency, invited delegations of non-member parliaments (e.g. from China), selected national space agencies (including NASA), organizations of the European space industry (e.g. Eurospace), as well as other institutions

[11] https://www.esa.int (accessed 21.02.2023).

[12] Documents stored in the Archives of the Office of International Affairs of the Sejm of the Republic of Poland.

[13] Art. 2 of the Charter of the European Interparliamentary Space Conference.

[14] *Ibid*.

[15] The Sejm, *op. cit*.

[16] Statute of the Polish Parliamentary Space Group.

[17] Art. 2 of the Charter of the European Interparliamentary Space Conference.

of the space sector and space industry attend the meetings. It is customary for the Conference to be opened by the head of the presiding parliament, and a representative of the government presents their country's achievements and plans regarding space policy. The EISC Conference concludes with its stance on the issues included in the agenda in a Resolution adopted by voting.

Thematic seminars are also organized. At least one by the currently presiding parliament and by other members. Plenary conference topics are generally preceded by seminar agendas. Bilateral meetings of the National Space Groups of particular parliaments are also organized. They are often accompanied by a presentation of the infrastructure, policy and ways to strengthen mutual cooperation. Their achievements are submitted to the Presidency for inclusion in the program materials of the Plenary Conference planned in a given year. The EISC members also organize or support the organization of seminars for scientific or business communities aimed at, for example, leading to their cooperation.

The purpose of the Conference meetings is, among other things, to determine a common strategy for Europe's space activity and the shape of its space policy. The activity of the EISC has shown that the visions and directions of development regarding space adopted in this group's resolutions have formed the basis for defining the European Space Policy and related agreements adopted by the European Union and the European Space Agency. This also relates to the EISC's contribution to determining the directions of the European space industry integration. The resolutions of the annual meetings (Conferences) are addressed to the parliaments and governments of the member states.

3. POLAND'S ACCESSION TO THE EUROPEAN INTERPARLIAMENTARY SPACE CONFERENCE AND THE 14TH EISC EUROPEAN INTER-PARLIAMENTARY SPACE CONFERENCE HELD IN POLAND

In 2002, during the "Space Information Seminar" organized in Warsaw by the European Commission and the European Space Agency, the issue of the participation of representatives of the parliaments of the then-candidate countries to the European Union in the work of the EISC was raised.

Since this seminar, the EISC has opened up and the Speaker of the Sejm of the Republic of Poland has received invitations for the Polish Parliament to participate in the events organized by the EISC. Also, the scientific community carried out undertakings aimed at convincing the Speaker of the Sejm of the Republic of Poland to the activity of the members of parliament in the EISC. As a result, the Speaker of the Sejm of the Republic of Poland appointed two deputies from the

Committee for Education, Science and Youth to participate in the works of the EISC. The deputies, with the support of the Space and Satellite Research Committee of the Polish Academy of Sciences[18] and the Space Research Center of the Polish Academy of Sciences[19], began their activity and thus initiated the journey to Poland's permanent membership in the European Interparliamentary Space Conference. They have established the National Parliamentary Space Group and asked the Speaker of the Sejm of the Republic of Poland to apply for EISC membership.[20]

In the second half of 2006, the Speaker of the Sejm sent a letter to the Chairman of the then Belgian Presidency of the EISC, in which he declared the will of the Polish Parliament to join the works of the EISIC. The Belgian Presidency forwarded the request to the Italian Presidency, which took over the duties. The Italian Presidency, after previous presentations on the scope of Polish space activities delivered by Deputy Bogusław Wontor at seminars in Kourou and Rome and discussions among ESIC members, accepted the Polish application and submitted it with a positive recommendation to the plenary session of the Conference. The 9th ESIC Plenary Conference, which was held in October 2007 in the Chamber of Deputies of Italy, accepted Poland's full membership in the ESIC.

As far as Polish activity in the EISC is concerned, it is worth emphasizing that Poland, at the invitation of the Speaker of the Sejm of the Republic of Poland, was awarded the organization and chairmanship of the 14th European Interparliamentary Space Conference in 2012.[21] As part of the presidency, among other things, we organized a seminar at the Collgium Maius of the Jagiellonian University during which we discussed the impact of space policy on ensuring sustainable development in the European economy. The seminar was attended by parliamentarians from national parliaments and the European Parliament. There were also scientists and experts from the European Space Agency, national space agencies of member states, space sector institutions and representatives of the European space industry and science.[22]

The main event of our presidency was the Plenary Conference organized in the Sejm of the Republic of Poland. Its theme was "The space sector and sustainable development". The debates were ceremonially opened by the Speaker of the Sejm Ewa Kopacz and Deputy Speaker Jerzy Wenderlich, who chaired the first part of the debates. The conference was also attended by a delegation of the Polish gov-

[18] https://kbkis.pan.pl (accessed 21.02.2023).

[19] https://cbkpan.pl/en/ (accessed 21.02.2023).

[20] Documents stored in the Archives of the Office of International Affairs of the Sejm of the Republic of Poland.

[21] Documents stored in the Archives of the Office of International Affairs of the Sejm of the Republic of Poland.

[22] E. Mamos-Gawryś, *Europejska Międzyparlamentarna Konferencja Kosmiczna*, Radio Parlament – Polskie Radio SA, 14.05.2012, https://www.polskieradio.pl/51/640/Artykul/603420, Europejska-Miedzyparlamentarna-Konferencja-Kosmiczna (accessed 21.02.2023).

ernment headed by Deputy Prime Minister and Minister of Economy Waldemar Pawlak. In addition to the delegation of EISC member countries, as well as MPs, the conference was attended by numerous experts and scientists from Poland[23] and abroad and representatives of: ministries, the President of the Republic of Poland, the National Security Bureau[24] and state administration offices.[25]

During the meeting, the following topics, among other things, were discussed: the issue of stimulating the development of life on Earth through the achievements in space and the use of space applications. The participants of the debate discussed the global management of space research, the possibilities of its use and the sustainable development of the space industry.

The speakers included: Japan's Deputy Minister of Foreign Affairs Kazayuki Hamada, who spoke about his country's involvement in space science and its support for space policy. He emphasized that Japan has regulated activities related to space exploration by law. Hamada added that the exchange of information between parliaments is an important element of space policy.

The Chairman of the UN Committee on the Peaceful Uses of Outer Space (COPUOS) Yasushi Horikawa spoke about the cooperation of UN member states in the field of space research. He stressed that space science, Earth observation and climate research are critical fields of international cooperation. The Chairman of COPUOS pointed out that the UN Committee is an important international platform that serves, among other things, as a negotiation forum for space-related decision-making. Horikawa, discussing the stages of the global regulation of space research, added that it is vital that we support the sustainable and safe development of space. "Space is getting more and more crowded (…) we have to be careful," said COPUOS Chairman in his speech during the Conference in the Polish Parliament.[26]

The speeches of participants focused on showing the importance of the space sector for the economic development of the world, especially in the European context. Members of the European Parliament: prof. Vittorio Prodi (President of the Space Group in the European Parliament), prof. Jerzy Buzek and prof. Bogusław Liberadzki spoke about the use of space in the European Union.[27]

The then Director General of ESA Jean-Jacques Dordain also delivered a speech devoted to the relations between the European Space Agency and the

[23] Kronika Sejmowa (The Sejm Chronicle) No. 24 (749) of 31 October 2012.

[24] National Security Bureau, *The 14 European Interparliamentary Space Conference*, 23.10.2012, https://www.bbn.gov.pl/pl/wydarzenia/4173,14-Europejska-Miedzyparlamentarna-Konferencja-Kosmiczna.html (accessed 21.02.2023).

[25] Documents stored in the Archives of the Office of International Affairs of the Sejm of the Republic of Poland.

[26] Documents stored in the Archives of the Office of International Affairs of the Sejm of the Republic of Poland.

[27] Kronika Sejmowa (The Sejm Chronicle) No. 24 (749) of 31 October 2012.

European Union (EU). He recognized the rightness of the close cooperation postulate, which was applauded by the participants of the meeting.

During the 14th EISC European Space Conference, the issue of European projects in a global context was also raised. The representative of the European Commission Rudy Aernoudt presented the idea of Global Monitoring for Environment and Security (GMES). Its goal was to create ways to monitor the state of the environment from satellite, air and ground levels. The data collected in this way will be processed in order to enable more effective management of the environment and to increase the level of EU citizens' security. GMES consists of three components. The first one is outer space, which allows for obtaining data from the satellite level. The second one is the ground component, i.e. devices and instruments for ground measurements. The third one is the data delivery infrastructure, i.e. the service component. – "GMES allows for long-term continuous monitoring, costless access to free information, common scales in all regions, as well as rapid information updating" – stressed Rudy Aernoudt (currently GMES has been renamed to COPERNICUS).

Axelle Pomies, a permanent representative of the Galileo Service, discussed the developing Global Navigation Satellite System (GNSS) market. The idea behind the GNSS is to create a civil navigation system with a worldwide coverage. Such an investment will contribute to the economic growth of the EU countries. "We cannot lose the opportunity that has opened up to us, it is a very important opportunity for today's Europe" – noted Pomies. The European satellite navigation system Galileo is an element of the designed solution (GNSS).

The Head of the Space Forum in the Directorate for Science, Technology and Industry of the Organization for Economic Co-operation and Development (OECD) Claire Jolly drew attention to the development of space economy. However, she noted that it is still small compared to other sectors.

ASD-Eurospace Secretary General Jean-Jacques Tortora estimated that the turnover of space industry producers in Europe is EUR 6 billion per year. He also added that the manufactured products are mainly used in science and the military.

Director of the European Space Policy Institute (ESPI) Peter Hulsroj raised the issue of the prospects for the sustainable development of the space industry in Poland.[28] He emphasized the importance of the space industry for the economy. He pointed out that the sustainable development of the space industry is not self-sufficient and requires investment from public funds and the involvement of public authorities.

Director of the Space Research Center of the Polish Academy of Sciences Marek Banaszkiewicz spoke about the achievements of the Polish space sector.

[28] More about ESPI in M. Polkowska, *Prawo kosmiczne w obliczu nowych problemów współczesnośc*i, Warsaw 2011, p. 138.

President of BUMAR Krzysztof Krystowski presented the prospects for the development of Polish companies in the space sector, which he exemplified with the company he manages.

Director General of HERTZ Systems Zygmunt Rafał Trzaskowski discussed the regional development of the space industry. He emphasized that the creation of the space economy sector has provided Polish investors, among others, with opportunities for establishing an interesting and responsible business.

In addition to the scientific and industrial dimension of the use of space, the issue of educational programs for young people and the need to create incentives for young people to gain qualifications that will enable their active involvement in the further development of this sector in the future were important topics of the debate. The search for such mechanisms was inscribed in an idea, which arose on the initiative of the Belgian and Polish delegations, to establish, under the auspices of the EISC, the ESA "Outer space as a space for sustainable development" Award, which was discussed during the conference by prof. Kai-Uwe Schrogl, the then Director of the ESA Strategy Department. He said that "… [t]he originators want to draw young people's attention to the importance of sustainable development. The submitted projects should combine space and sustainable development, using them together in such areas as telecommunications or navigation."[29] I can add that the program is very popular among young people. Many projects are submitted to ESA every year. During the conference, Secretary of State at the Ministry of National Education Tadeusz Sławecki gave praise to this program. He also said that school curricula should include elements related to the broadly understood space.

The conference was accompanied by an exhibition dedicated to the Polish space sector organized in the Sejm. Our devices were also presented during the exhibition. The following companies presented their achievements: ABM Space, Astri Polska, BUMAR, CBK PAN, Geo Systems, GMV, HERTZ Systems, KNP-LiK, Kosmonauta.net, MAGMA 2, PIAP, Warsaw University of Technology, Radiotechnika, Robotics Inventions, SENER, Small GIS and SKA.[30]

It may be added that the EISC Plenary Conference coincided with the final phase of the legislative process related to Poland's accession to the European Space Agency, which was not accidental.

After the presidency of the Polish Parliament, the headship was taken over by the following parliaments:

- In 2013, the presidency was held by the Belgian Parliament.
- In 2014, the presidency was held by the French Parliament.
- In 2015, the presidency was held by the Spanish Parliament.
- In 2016, the presidency was held by the Romanian Parliament.

[29] Documents stored in the Archives of the Office of International Affairs of the Sejm of the Republic of Poland.

[30] Kronika Sejmowa (The Sejm Chronicle), No. 24 (749) of 31 October 2012.

- In 2017, the presidency was held by the Estonian Parliament.
- In 2018, the presidency was held by the Belgian Parliament.
- In 2019, the presidency was held by the German Parliament.
- Due to the pandemic, the presidency was held by the Norwegian Parliament for two years, i.e. in 2020 and 2021.
- In 2022, the presidency was held by the French Parliament.

In 2023, the presidency will be taken over by the Austrian Parliament.[31]

Each Conference yields the passing of a resolution by parliamentary delegations, which is the result of work during the entire presidency. It is the most important political document that goes to national parliaments in Europe, the European Union bodies and institutions of the space sector. Below are the resolutions adopted by the 14th EISC – Polish presidency and the last 24th EISC – French presidency.[32]

4. CONCLUSIONS AND RECOMMENDATIONS

Stelmackh believes that Global Space Governance "is not about taking a leadership but about interacting and involving all space actors". This is why it is worth underlining that the EISC should be included in this global structure.[33] Considering this concept, it is also essential that membership in this entity be expanded, whereby we can build a stronger understanding and familiar voice of actors involved in space exploration.

At the same time, the EISC voice takes into consideration national interests represented by the parliaments involved. Each country has its own regulations with respect to national law regulating its involvement in space exploration. One of space activities applications is military, which requires that space national systems be oriented towards national security.

The EISC as a parliamentary platform provides the possibility for partners to create the necessary political understanding at the early stage of discussion.

[31] The EISC homepage, eisc-europa.eu (accessed 21.02.2023).

[32] Appendix 1.

[33] O. Stelmakh, *Global Space Governance for Suitable Development*, UNISPACE +50 – High Level Forum, 22 November 2016, https://www.unoosa.org/documents/pdf/hlf/1st_hlf_Dubai/Presentations/75.pdf (accessed 21.02.2023).

REFERENCES

Balogh W., *Institutional Aspects* (in:) Ch. Brunner, A. Soucek (eds), *Outer Space in Society, Politics and Law*, Vienna 2011

Oltrogge D., Christensen I., *Space Governance in the New Space Era*, 'Journal of Space Safety Engineering' September 2020, Vol. 7(3), https://doi.org/10.1016/j.jsse.2020.06.003 (accessed 21.02.2023)

Polkowska M., *Prawo kosmiczne w obliczu nowych problemów współczesności*, Warsaw 2011

Stelmakh O., *Global Space Governance for Suitable Development*, UNISPACE +50 – High Level Forum, 22 November 2016, https://www.unoosa.org/documents/pdf/hlf/1st_hlf_Dubai/Presentations/75.pdf (accessed 21.02.2023)

Vent C., *The Political Dimension*, (in:) Ch. Brunner, A. Soucek (eds), *Outer Space in Society, Politics and Law*, Vienna 2011

Appendix 1:

Resolution 14th EISC European Interparliamentary Space Conference Parliament of the Republic of Poland Warsaw, 22–23 October 2012	Resolution 24th European Interparliamentary Space Conference Paris, France, 15-16 September 2022
RECOGNIZING space activity as not only advancing the knowledge and applications domain but also the unique means to understand, measure and monitor most of the environment and climate related phenomena in a regular way over the world on large regions, hence providing invaluable awareness, insight and indicators to inform the political decision makers. BEING AWARE of the negotiations of the European Commission's proposal on the Next Multiannual Financial Framework of the EU (MFF, 2014 - 2020), including space matters, TAKING INTO ACCOUNT the ESA Council Meeting at Ministerial Level to be held on November, 20/21, 2012, The 14th European Inter-parliamentary Space Conference strongly encourages: a successful and appropriately funded European space policy	RECALLING the crucial role of space for economic growth, innovation and employment, for Europe's security and defence, and for dealing with global challenges, in particular climate change and its consequences; NOTICING the deterioration of the geopolitical context resulting in particular from the unacceptable Russian aggression in Ukraine, and its consequences for the European space sector and for international cooperation in space; RECOGNIZING the strategic need, in this context, for Europe to have autonomous and sustainable access to space; EMPHASIZING the importance to keep in mind the economics of the European autonomous and sustainable access to space; RECALLING that Europe should develop its independent human and robotic space exploration capabilities while continuing to coop-

- CONSIDERS therefore the development of a European space policy and its implementation as a joint responsibility of the EU, ESA and Member States, which has to take into account the contribution of this policy towards sustainable development by the integration of space and ground-based segments in R&D, industrial areas and space-enabled applications;
- URGES the definition of clear roles, with no duplication of responsibilities; for the implementing bodies – the EU, ESA and other related agencies (including GSA, EEA, EUMETSAT, FRONTEX, EUSC, EMSA, EDA);
- INVITES the ESA Council Meeting at Ministerial Level 2012 to encourage those EU Member States which are not Members of ESA to engage in ESA activities of common interest;

A sustainable European Space Policy
- WELCOMES ESA's approach to the comprehensive application of principles of sustainability, encompassing technology development, governance and operations as well as social factors;
- INVITES the EU, ESA and the Member States to safeguard the future of space activities by protecting the environment, both on Earth and in Space and ENCOURAGES all parts involved to continue working towards a fully operational European SSA program, building on the work performed so far.
- WELCOMES the announcement by ESA to launch a 'Space for Sustainability Award', under the auspices of the EISC, for students and young professionals in order to promote the link between space and sustainable development in response to European and international challenges.

The sustainable deployment and exploitation of the European flagship programmes
- WELCOMES the discussions between the EU Council, the European Parliament and the European Commission in the context of the negotiations related to the adoption of the Regulation on GNSS programmes, which make possible a further role of ESA, erate internationally in this field of strategic, economic and societal importance;

ENCOURAGING therefore all efforts to increase participation in the EISC, including through the extension of participation to European States which are not yet members in accordance with Art. 2 of the Charter of the European Interparliamentary Space Conference;

EMPHASIZING the challenges of sustainability in space, particularly in view of the proliferation of space debris in low earth orbit;

BEING CONCERNED that space pollution, which includes phenomena such as but not limited to space debris, light pollution, and congestion of the frequency spectrum, may restrict the access of European States to space and jeopardize the safety of the space infrastructure and the security of space actors;

CONSIDERING that regulating activities through appropriate national or multilaterally agreed regulations in outer space is essential to ensure the economic growth and sustainability of the orbital environment and the continuation of space exploration activities;

CALLING therefore on all European States to continue their efforts in adopting such national or multilaterally agreed regulations and space laws in line with the objectives of sustainable development and in accordance with international space law.

The XXIV European Interparliamentary Space Conference (EISC):

On the objective of European strategic autonomy to guarantee a more sustainable access to space

- AFFIRMS that European strategic autonomy in space is more than ever a priority that must be pursued by all European States;
- CONSIDERS European strategic autonomy in space requires a competitive and

in addition to its original role vis-à-vis its Member States;
- ENCOURAGES ESA, the EU and Member States to continue dialogue to define stable and sound governance and industrial policy for future common space projects; which should clearly define responsibilities, avoid duplications and preserve a balanced and competitive space sector throughout Europe

- ENDORSES the Resolution of the European Parliament on the financing of GMES by allocating within the next EU Multiannual Financial Framework (MFF) the means to secure GMES deployment and operations in the timeframe 2014 -2020;
- WELCOMES the 2011 Space Council Resolution on "Benefits of space for the security of European citizens" in which it "RECOMMENDS that the European Commission in close collaboration with the European External Action Service (EEAS), Member States and relevant EU agencies, such as FRONTEX, EUSC and EMSA, finalize the definition of, and accelerate the transition towards, fully operational GMES security services in support of EU external actions and border and maritime surveillance, based on user demand;"
- CALLS UPON the European Commission, in close consultation with all relevant stakeholders, to study and apply in the context of the GMES security services a sound governance structure taking into account their specificities;

A competitive European space industry
- CONSIDERS that the independence of Europe in space depends on the availability of a sustainable supply chain that can deliver the critical technologies required for the implementation of its programs;
- CALLS UPON the need to develop and expand commercial markets in Europe through and for space technologies.
- RECOGNISES the importance of a competitive space industry, taking into account the crucial role of exports to the health of the European space sector, and therefore welcomes the ambitious proposals of ESA at

innovative industry in Europe in a context of an increasing international competition;
- RECALLS the importance of competitive approaches in the European launcher sector;
- AFFIRMS that the continuation and the development of Ariane 6 is a main priority for at least the next ten years;
- CONSIDERS in this regard that it is essential to master the technologies of the future and their supply, production and marketing chains in order to guarantee autonomous and sustainable European access to space;
- DEFENDS the preference for the European space infrastructure, through priority use of European launchers from European launch bases, and that exemptions to this principle may apply in case adapted European infrastructures are unavailable.

On the development of "New Space" to guarantee a more sustainable access to space

- RECOGNIZES the complementary role that can be achieved, at all levels, by the traditional economic and industrial actors of the space sector and those of "New Space";
- SUPPORTS the development of micro--launchers and small launchers as a complement to heavy launchers in order to allow a European preference for the whole range of launchers;
- ENCOURAGES in particular the research, development and financing of promising technologies, such as but not limited to reusable technologies, in order to allow European States to have a more sustainable access to space and to ensure the pace and sustainability of their own launches;
- CALLS UPON the European States to Use public procurement as a leverage as well as to establish ecosystems of specialized investment funds to support the growth of European "New Space" actors at all stages of their development;
- EMPHASISES that "New Space" activities, in particular deployment of large constellations of satellites, need to be conducted in a sustainable way and thus

the Ministerial Council and urges the EU to encourage the development of space based telecommunications throughout Europe
- CALLS FOR agreement to ensure a sustainable, independent European launcher capability

A responsible use of outer space
- WELCOMES the ESA Clean Space Initiative, which ensures the proactive environmental awareness of European space programmes and promotes innovation for the sustainable exploitation of space for future generations;

The use of space assets to promote global sustainable development
- ENCOURAGES the EU, ESA and Member States to take a joint approach to implementing space applications and services as an instrument in the European sustainable development regulations in eco-strategy;
- SUPPORTS CALLS FOR European space programmes to make a greater contribution towards the sustainable management of natural resources and the protection and preservation of the environment in developing countries.

The further development of EISC

EISC welcomes and accepts the request for Full Membership by the Parliament of Estonia.

Appointment of the next presidencies

The Presidency of 15th EISC, from 1 January to 31 December 2013, will be held by the Parliamentary Space Group of the Parliament of Belgium.

The Presidency of 16th EISC, from 1 January to 31 December 2014, will be held by the Parliamentary Space Group of the Parliament of France.

Therefore, the Trio of the EISC for 2013 comprises: Poland, Belgium and France.

ENCOURAGES the European States to develop technologies for safe spacecraft operation, maintenance and disposal at end of life.

On the fight against space pollution to develop more sustainable uses of space

- RECALLS that the development of space applications contributes to better observation of the Earth, monitoring of climate change and its consequences, and thus plays a key role in supporting public policies implemented to preserve our environment;
- INSISTS on the need to guarantee the peaceful and more environmentally friendly uses of outer space in order to limit space pollution, in particular the proliferation of space debris of all sizes in lower orbit;
- CONSIDERS it necessary to strengthen synergies between governmental and commercial space situational awareness (SSA) data collection and analysis capabilities in order to improve capabilities for the identification of space debris of all sizes and the prevention of collision risks;
- CALLS on the European space community to strengthen the obligations of space sector actors to avoid and reduce space debris in terms of equipment sustainability, mitigating space debris, and the safe disposal and deorbiting of space systems and objects which are no longer used and, for the Member States of the European Union, to support and contribute to the development of common standards and rules for space spacecraft operations and space traffic management, while preserving the competitiveness of the European space industry on the global market.
- HOPING that the next ministerial conference of the European Space Agency will allow rapid progress on these strategic subjects.