

# Safety Zones on the Moon: International and National Legal Dimension

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## Abstract

Extraction and utilization of lunar resources are most interesting today for specialists of different occupations in the space sphere. Even though people have not yet started actual activity on the Moon, and humanity does not know how will realize this activity in practice, different aspects of the international legal regime of this activity are of considerable interest for space lawyers. One of such questions is the safety of space activities on the Moon, where establishing safety zones is essential too.

The presented article will be devoted to the complex international and national legal research of safety zones. It will help single out characteristics and principles of enacting safety zones on the Moon.

## 1. Introduction

Safety questions of space activities are the most pressing issues these days. The increasing number of participants in space activities and the emergence of new types in space activities are required to draft new international legal regulations. The agenda items of the UN COPUOS include more and more topics for discussion, starting from space traffic management<sup>1</sup> and finishing by exploitation and utilization of space resources.<sup>2</sup>

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1 UN Doc. A/AC.105/1243 “Report of the Legal Subcommittee on its sixtieth session, held in Vienna from 31 May to 11 June 2021,” p. 30 – 33 (accessed 01.09.2021)

2 UN Doc. A/AC.105/1243 “Report of the Legal Subcommittee on its sixtieth session, held in Vienna from 31 May to 11 June 2021,” p. 30 – 33 (accessed 01.09.2021)

Many controversies have been raised in the UN COPUOS<sup>3</sup> and the doctrine<sup>4</sup> concerning the latest item. The first problem was an absence of an international legal “regime including appropriate procedures, to govern the exploitation of the natural resources of the Moon.”<sup>5</sup> The second question was how to draft it if lunar activities have not started yet in practice.

Due to these facts, these and other questions have started to be discussed under the UN COPUOS umbrella and based on different international non-governmental organizations and projects, such as the International Institute of Space Law,<sup>6</sup> the Moon Village Association,<sup>7</sup> the Outer Space Institute,<sup>8</sup> the Space Treaty Institute,<sup>9</sup> the Hague International Space Resources Governance

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- 3 See: Working group established under the Legal Subcommittee agenda item “General exchange of views on potential legal models for activities in the exploration, exploitation and utilization of space resources.” <https://www.unoosa.org/oosa/en/ourwork/copuos/lsc/space-resources/index.html>
  - 4 See: D. O’Brien, Is outer space a de jure common-pool resource? The space review, October 25, 2021. <https://www.thespacereview.com/article/4270/1> (accessed 29.10.2021); M.E. Burger, SpaceWatchGL Opinion: The Artemis Accords’ Proposed “Safety Zones” On The Moon A Good Start, [spacewatch.global/2020/05/spacewatchgl-opinion-the-artemis-accords-on-bringing-safety-zones-to-the-moon-and-some-expectations/](https://spacewatch.global/2020/05/spacewatchgl-opinion-the-artemis-accords-on-bringing-safety-zones-to-the-moon-and-some-expectations/) (accessed 29.10.2021); N. Rosso, The legal limitations of safety zones in Outer Space, [medium.com](https://medium.com/@NinoRosso/the-legal-limitations-of-safety-zones-in-outer-space-9faf949457be), Jul. 14, 2020. <https://medium.com/@NinoRosso/the-legal-limitations-of-safety-zones-in-outer-space-9faf949457be> (accessed 29.10.2021); J.K. Schingler, Imagining safety zones: Implications and open questions, The Space Review, June 8, 2020. <https://www.thespacereview.com/article/3962/1> (accessed 29.10.2021).
  - 5 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, entered into force July 11, 1984: 1363 UNTS 3 (Moon Agreement) // International space law: Documents of the United Nations. New York, 2017 / UN Document ST / SPACE / 61 / Rev.2, pp. 30–39. Article 11 (5).
  - 6 Statement by the Board of Directors Of the International Institute of Space Law (IISL) On Claims to Property Rights Regarding The Moon and Other Celestial Bodies. [https://iislweb.space/wp-content/uploads/2020/01/IISL\\_Outter\\_Space\\_Treaty\\_Statement.pdf](https://iislweb.space/wp-content/uploads/2020/01/IISL_Outter_Space_Treaty_Statement.pdf) (accessed 01.10.2021); Statement of the Board of Directors of the International Institute of Space Law (IISL) dated March 22, 2009. <https://iislweb.space/wp-content/uploads/2020/01/Statement-BoD.pdf> (accessed 01.10.2021); Position Paper on Space Resource Mining, Adopted by consensus by the Board of Directors on 20 December 2015. <https://iislweb.space/wp-content/uploads/2020/01/SpaceResourceMining.pdf> (accessed 01.10.2021).
  - 7 The Moon Village Association, Official Web Site. <https://moonvillageassociation.org/> (accessed 01.10.2021).
  - 8 The Outer Space Institute, Official Web Site. <http://outerspaceinstitute.ca/index.html> (accessed 01.10.2021).
  - 9 The Space Treaty Institute, Official Web Site. <http://spacetreaty.org/> (accessed 01.10.2021).

Working Group,<sup>10</sup> the Action Team on Effective and Adaptive Governance for a Lunar Ecosystem (E.A.G.L.E. Team),<sup>11</sup> etc.

Various types of platforms for resolving the problem of necessity to draft and establish a specialized international legal regime of future activities on the surface of Moon were a consequence of numerous interesting subjects in lunar activities, first of all, of non-governmental entities (for example, iSpace company with its HAKUTO-R Project<sup>12</sup>).

This tendency led to the drafting of national legislation (ex. USA, Luxemburg, UAE, Japan)<sup>13</sup> programs (ex. the Artemis program<sup>14</sup>), principles (ex. the Building Blocks for the Development of an International Framework on Space Resource Activities<sup>15</sup> or the Moon Village Principles<sup>16</sup>), recommendations (ex. the Vancouver Recommendations on Space Mining<sup>17</sup>), and suggestions (ex. the Model Implementation Agreement for the Moon

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10 The Hague International Space Resources Governance Working Group, International Institute of Air and Space Law. <https://www.universiteitleiden.nl/en/law/institute-of-public-law/institute-of-air-space-law/the-hague-space-resources-governance-working-group> (accessed 01.10.2021).

11 The EAGLE Action Team. Space Generation Advisory Council. <https://spacegeneration.org/eagle> (accessed 01.10.2021).

12 HAKUTO-R Project. iSpace. <https://ispace-inc.com/project/> (accessed 01.11.2021).

13 The U.S. Commercial Space Launch Competitiveness Act dated November 25, 2015. Public Law 114-90. <https://www.congress.gov/bill/114th-congress/house-bill/2262/text> (accessed 01.10.2021); Law of July 20th 2017 On the Exploration and Use of Space Resources. [https://space-agency.public.lu/en/agency/legal-framework/law\\_space\\_resources\\_english\\_translation.html](https://space-agency.public.lu/en/agency/legal-framework/law_space_resources_english_translation.html) (accessed 01.10.2021); Federal Law No. 12 Issued on 19/12/2019 Corresponding to 22 Rabi' Al-Akhar 1441H. On the Regulation of the Space Sector. [https://space.gov.ae/Documents/PublicationPDFFiles/SpaceSectorFederalLaw\\_EN.pdf](https://space.gov.ae/Documents/PublicationPDFFiles/SpaceSectorFederalLaw_EN.pdf) (accessed 01.10.2021); Act on the Promotion of Business Activities Related to the Exploration and Development of Space Resources (the Space Resources Act. <https://kanpou.npb.go.jp/old/20210623/20210623g00141/20210623g001410004f.html> (accessed 01.10.2021).

14 NASA's Lunar Exploration Program Overview. 2020. [https://www.nasa.gov/sites/default/files/atoms/files/artemis\\_plan-20200921.pdf](https://www.nasa.gov/sites/default/files/atoms/files/artemis_plan-20200921.pdf) (accessed 01.10.2021).

15 The Building Blocks for the Development of an International Framework on Space Resource Activities. <https://www.universiteitleiden.nl/binaries/content/assets/rechtsgeleerdheid/instituut-voor-publiekrecht/lucht--en-ruimterecht/space-resources/bb-thissrww--cover.pdf> (accessed 01.10.2021).

16 The Moon Village Principles (MVP) Issue 2, draft. <https://moonvillageassociation.org/moon-village-principles-mvp-issue-2-draft-public-consultation-opens/> (accessed 01.10.2021).

17 The Vancouver Recommendations on Space Mining. [http://www.outerspaceinstitute.ca/docs/Vancouver\\_Recommendations\\_on\\_Space\\_Mining.pdf](http://www.outerspaceinstitute.ca/docs/Vancouver_Recommendations_on_Space_Mining.pdf) (accessed 01.10.2021).

Treaty<sup>18</sup>, a Lunar Governance Charter<sup>19</sup>) dedicated to the lunar governance regime and the use of lunar resources.

Considering that discussion at the beginning of that process started earlier at the national level compared to the international level, some national initiatives had been seemed to be contrary to international space law. One of such questions is the establishment of safety zones as a requirement of safety and sustainability of lunar activities in the future, and the fulfillment of obligations under international treaties and principles of international space law. Further, there will be a detailed analysis of that question.

### 1.1. **The Outer Space Treaty 1967 and the Moon Agreement 1979 on Safety Zones**

The Outer Space Treaty 1967 does not contain specific articles on safety zones; however, it stipulates some related provisions:

1) It states that:

*Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States [...], and there shall be free access to all areas of celestial bodies.*

At the same time, it is said that “*there shall be freedom of scientific investigation*” (Art. I, part 2 and 3).

2) Then the Outer Space Treaty 1967 enshrines the provision which says that States shall be guided by the **principle of cooperation and mutual assistance** and shall conduct all their [space] activities (in outer space, including the Moon and other celestial bodies), with **due regard** to the corresponding interests of all other States (Art. IX, sentence 1).

3) After that it is said that if a State

*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*

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18 The Model Implementation Agreement for the Moon Treaty <http://spacetreaty.org/modelimplementationagreementcurrent.pdf> (accessed 01.10.2021).

19 Effective and Adaptive Governance for a Lunar Ecosystem, Lunar Governance Report. Approved and adopted by SGAC, May 10, 2021. <https://spacegeneration.org/wp-content/uploads/2021/12/EAGLE-Report.pdf> (accessed 01.10.2021).

In that case, there is a possibility to request **consultation** concerning the activity or experiment (Art. IX, sentences 3-4).

Moreover, the Outer Space Treaty 1967 contains a special provision on a lunar regime. For instance, openness of all stations, installations, equipment and space vehicles on the Moon on a basis of reciprocity with reasonable advance notice of it (Art. XII).

From the point of establishing safety zones, these provisions could seem contradictory. If a State establishes safety zones, how it would provide free access to all areas of celestial bodies (Art. I) with due regard to the corresponding interests of all other States (Art. IX) and with open access to all stations, installations, equipment, and space vehicles on the Moon (Art. XII)?

However, it is not a violation of these provisions. It is well known that all provisions of the Outer Space Treaty 1967 are interrelated. It contains principles of exploring and using outer space, the Moon, and other celestial bodies. So that, establishment of safety zones could be a possible instrument for safe and sustainable lunar activities on an equal basis with respect to the rights of other participants, including one of the main principles of international space law – the non-appropriation principle (Art. II).

Unfortunately, the Outer Space Treaty 1967 does not contain any detailed provisions on safety zones as it was mentioned before. Only interpreting can be applied here to understand some basic provisions which could be helpful in the process of establishing and regulating safety zones and other questions on lunar activity.

This is precisely why the Moon Agreement 1979 as *lex specialis* was supposed to expand and to concretize the international legal regime of the Moon and to clarify all questions. Partially this Agreement repeats the provisions of the Outer Space Treaty 1967:

Article 4: “*The exploration and use of the Moon shall be the province of all mankind and shall be carried out for the benefit and in the interests of all countries...*”

Article 8(1): “*States Parties may pursue their activities in the exploration and use of the Moon anywhere on or below its surface ...*” There should not be any interference with the activities of other States Parties on the Moon and if interference may occur, the States Parties concerned shall undertake consultations (Art. 8 (3)).

Article 9(1): “*States Parties may establish manned and unmanned stations on the Moon*”.

Article 9(2): “*Stations shall be installed in such a manner that they do not impede the free access to all areas of the Moon of personnel, vehicles and equipment of other States Parties.*”

Article 11(2): “*The Moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means.*”

Article 15(1): “*All space vehicles, equipment, facilities, stations and installations on the Moon shall be open to other States Parties.*” This includes necessity to “*give reasonable advance notice of a projected visit, in order that appropriate consultations may be held and that maximum precautions may be taken to assure safety and to avoid interference with normal operations.*”

Analysis of the Moon Agreement shows that there are also no provisions on safety zones, even though some of them touch on safety questions during the lunar activity.

## **1.2. The UN Guidelines for the Long-Term Sustainability of Outer Space Activities 2019 and Safety Zones**

The UN Guidelines for the Long-Term Sustainability of Outer Space Activities 2019, of course, does not contain any provisions on safety zones but has some basic recommendations about safety and international cooperation, which could help regulate safety zones on the surface of the Moon.

Firstly, in the Long-Term Sustainability Guidelines 2019 lots of attention pays to information sharing based on international cooperation. Thus, part B of the Guidelines titled “Safety of space operations” is dedicated to space aeronavigation aspects in the context of space objects’ operation in near-Earth space. This part shows how sharing information is important for space activities to save outer space and ensure its sustainability. Considering that many States and non-governmental entities are interested in the lunar activity and going to exploit lunar resources and/or build some stations or bases, it is crucial to share information about special safety zones on a timely basis.

Today near-Earth space includes many actors using and exploring it; the same situation could be on the Moon – with numerous actors and stakeholders.

The following guidelines could be used for drafting specialized rules on safety zones from the point of information sharing:

Part B “Safety of space operations”, especially guideline to “provide updated contact information and share information on space objects and orbital events” (Guideline B.1), which underlines that:

The information exchanged should, to the extent practicable, be reliable, accurate and complete, and be concluded to be so by the providing entity. The information to be exchanged, including time reference and period of applicability and other relevant information, should be provided in a timely manner and on a mutually agreed basis.

Part C. “International cooperation, capacity-building and awareness” is dedicated to the significance of international cooperation in general in the context of space activities and capacity-building. There could be underlined such guidelines as:

Guideline C.1 “Promote and facilitate international cooperation in support of the long-term sustainability of outer space activities;”

Guideline C.2 “Share experience related to the long-term sustainability of outer space activities and develop new procedures, as appropriate, for information exchange;”

Guideline C.3 “Promote and support capacity-building.”

The guidelines show and suggest possible directions how States should follow principle of cooperation and mutual assistance enshrined in the Outer Space Treaty 1967, despite that Long-Term Sustainability Guidelines 2019 (as a whole document) “are voluntary and not legally binding under international law”, although “any action taken towards their implementation should be consistent with the applicable principles and norms of international law” (Status of Guidelines, para. 15).<sup>20</sup>

### **1.3. Safety Zones in Different Branches of International Law**

For understanding the legal nature of safety zones, it is interesting to consider the experience of other branches of international law, especially, law of the sea and its main international treaty – the United Nations Convention on the Law of the Sea (hereinafter – UNCLOS 1982).

UNCLOS 1982 suggests the opportunity of States to provide safety zones around its installations in the context of activities in the Area (Art. 147 of Part XI “Area,”) and carry out maritime scientific research in the Area (Part XIII “Marine Scientific Research”).

Article 147 stipulates that “Activities in the Area shall be carried out with reasonable regard for other activities in the marine environment,” (1) in that context “installations used for carrying out activities in the Area shall be subject” to several conditions (2), one of them is establishment of safety zones “around such installations with appropriate markings to ensure the safety of both navigation and the installations” (2.c).

Article 256 of the UNCLOS 1982 says that States “have the right, in conformity with the provisions of Part XI, to conduct marine scientific research in the Area.” (this provision resembles the principle of freedom of scientific investigation enshrined in Art. I of the Outer Space Treaty 1967 and principle of freedom of scientific investigation on the Moon – art. 6 of the Moon Agreement 1979).

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<sup>20</sup> UN Doc. A/74/20. Annex II. Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee on the Peaceful Uses of Outer Space.

Section 4 “Scientific Research Installations or Equipment in the Marine Environment” (articles 258 – 262, Part XIII “Marine Scientific Research”) of the UNCLOS 1982 concretizes legal status and regime of scientific research installations:

The installations or equipment [...] do not possess the status of islands. They have no territorial sea of their own, and their presence does not affect the delimitation of the territorial sea, the exclusive economic zone or the continental shelf (Art. 259).

Also, States may create around scientific research installations safety zones with a reasonable breadth not exceeding *a distance of 500 metres*. “All States shall ensure that such safety zones are respected by their vessels” (Art. 260). Certainly, in that case, establishment of safety zones bounds with scientific activity in international space – Area. But this example shows that international law has in its practice a notion of ‘safety zone’ without any territorial claims and for ensuring the safety of such kind of activity. States can use this practice to establish safety zones on the surface of the Moon, conducting lunar activities with due regard for the principles of international space law and provisions of the Outer Space Treaty 1967.

There are no other similar examples in international law as in international law of the sea, where the specific chapter is dedicated to safety zones in some “common” areas, to its legal status and regime.

At the same time, the international law of telecommunication and international air law, which are close by some characteristics to international space law, contain some provisions on safety aspects.

ITU Constitution has the following provisions:

Article 44 establishes rules for “Use of the Radio-Frequency Spectrum and of the Geostationary-Satellite and Other Satellite Orbits,” and Article 45 “Harmful Interference” stipulates that:

All stations, whatever their purpose, must be established and operated in such a manner as not to cause harmful interference to the radio services or communications of other Member States or of recognized operating agencies, or of other duly authorized operating agencies which carry on a radio service, and which operate in accordance with the provisions of the Radio Regulations.

Convention on International Civil Aviation 1944 together with the Annex 19 “Safety Management or safety management” regulates safety of civil aviation.

#### 1.4. International Initiatives and Safety Zones

The special attention to safety zones firstly has appeared in the documents drafted on the use, exploitation, and utilization of space resources by the Hague International Space Resources Governance Working Group and in the Artemis Accords (Principles for a Safe, Peaceful, and Prosperous Future) in the framework of the US lunar program “Artemis.”

The document drafted by the Hague International Space Resources Governance Working Group titled “Building Blocks for the Development of an International Framework on Space Resource Activities” 2019 has para. 11 “Technical standards for, prior review of, and safety zones around space resource activities.” It says that “space resource activity has to be carried out ‘in a safe manner to avoid harmful impacts’” (para. 11.1). Under such conditions States and international organizations responsible for space resource activities may

establish a safety zone, or other area-based safety measure, around an area identified for a space resource activity as necessary to assure safety and to avoid any harmful interference with that space resource activity (para 11.3)

To continue, para. 11.3 permits to establish a safety zone with *saving free access to any area but can restrict access to it for a limited period of time with prior timely public notice*. Appropriate international consultations are undertaken in case of possible overlap of safety zones or conflicts (para. 11.4). It is important, that Article II of the Outer Space Treaty 1967 allocating principle of non-appropriation is underlined at the very beginning of the para. 11.3.

Moreover, the Building Blocks 2019, in the framework of sharing information about space resources activities, says about the necessity to give advance notification of such activities, “including any area-based safety measure associated with them...” (para. 14b). In that case, for making publicly available “advance notifications of space resource activities, including any area-based safety measures,” it is required to establish and maintain an international database (para. 18b).

The Artemis Accords in the section 11 contains provisions for the “Deconfliction of Space Activities”. Firstly, this section has references to the before-mentioned articles IX, XI of the Outer Space Treaty 1967 and to the whole treaty in the context of principles due regard and avoidance of the harmful interference (paras 1, 3). Secondly, it has reference to the Long-Term Sustainability Guidelines 2019 (para. 2). Besides that, section 11 covers requirement to “seek to refrain from any intentional actions that may create harmful interference with each other’s use of outer space” (para. 4) and to inform each other “with necessary information regarding the location and

nature of space-based activities” (para. 5). Parties of the Artemis Accords are intending to contribute to further development of “international practices, criteria, and rules applicable to the definition and determination of safety zones and harmful interference” (para. 6).

Finally, Artemis Accords suggests a definition of a ‘safety zone’ and contains principles related to it. The establishment of a safety zone is based on the thought that it is an *implementation of Article IX of the Outer Space Treaty* in the context of requirements on the necessity to notify on, to coordinate activities, and to avoid harmful interference (para. 7). ‘Safety zone’ in accordance with the Artemis Accords is an “area wherein this notification and coordination will be implemented to avoid harmful interference” (para. 7). Then there are 4 principles: two principles are about size and scope of safety zones, one principle is about the nature and existence of safety zones (it is said that “safety zones will ultimately be temporary, ending when the relevant operation ceases”) and the last one again underlines conformity of these provisions with Article IX of the Outer Space Treaty.

Establishing safety zones Parties of the Artemis Accords are committing “to respect the principle of free access to all areas of celestial bodies and all other provisions of the Outer Space Treaty in their use of safety zones.”

Only one phrase makes a little concern that safety zones are expected “to change, evolve, or end based on the status of the specific activity (para. 11).” It means that any lunar activity could make harmful interference and that territory with such activity will require a safety zone, which in turn would exist for a long time. Maybe this formulation could be a trick to get around the principle of non-appropriation (Article II of the Outer Space Treaty 1967), bearing in mind that official opinion of the USA that “*extraction of space resources does not inherently constitute national appropriation under Article II of the Outer Space Treaty*” (section 10, para. 2 of the Artemis Accords). If we put together the possibility of extracting resources and establishing a safety zone to avoid harmful interference for an unlimited period, *de facto*, it could be appropriation. Hopefully, it is just a suggestion as establishment of safety zones

may at any time become a subject of international discussion with relation to any specific zone, should other states display an interest in this, and compromise decisions on controversial issues may be taken in the process of such discussions<sup>21</sup>

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21 G. Zhukov, Y. Kolosov, *International Space Law*. 2<sup>nd</sup> edition, stereotyped, Statut, Moscow, 2014. P. 64.

The Moon Village Principles 2020 do not have mentioning of safety zones but have several principles dedicated to the safety of lunar activities in elaboration of the context Article IX of the Outer Space Treaty 1967. Principle 8 says about taking appropriate measures to avoid:

causing harm to the Moon, cislunar space, or existing lunar activities, including the harmful contamination of the Moon” and “harmful interference with existing lunar activities”, as well as to avoid “changes to sites of significant scientific or historical interest.

Principles 9-11 are about establishing of a publicly available international land-use registry (principle 9) and an international publicly available database (principle 11) which will be used but not limited to sharing information about different lunar activities.

Principle 12, among other tasks, includes a recommendation to support the development of safety practices.

Model Implementation Agreement for the Moon Treaty (version of 2021, September) contains several sections which highlight a right of *safe* access any resources (para. 3) and *safe* utilization of outer space resources (para. 6).

A Lunar Governance Charter – the beginning idea of the E.A.G.L.E. Team also has a chapter on safety zones. It determines the purpose of safety zones as “avoidance of harmful interference among lunar operations.”<sup>22</sup> A safety zone includes limited size (only to avoid interference) and conditions for its temporal extension and classification on the basis of ongoing operations in the concerned area. Safety zones are not keep-out zones.<sup>23</sup> Novelty of the proposal to the safety zones is to expand “the concept of safety zones and introduce several zones requiring different coordination levels between actors.”<sup>24</sup> In comparison with the Artemis Accords, a part on safety zones is built on Articles I, II, and IX and XI of the Outer Space Treaty 1967, not limited to Article IX.

### 1.5. National Space Law and Safety Zones

The last level of regulation is national. Article VI of the Outer Space Treaty 1967 contains provision that States shall bear international responsibility for

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22 Effective and Adaptive Governance for a Lunar Ecosystem. Lunar Governance Report, Approved and adopted by SGAC, May 10, 2021. <https://spacegeneration.org/wp-content/uploads/2021/12/EAGLE-Report.pdf>, p. 40, para. 3.2.9, Recommendation.

23 Effective and Adaptive Governance for a Lunar Ecosystem. Lunar Governance Report, Approved and adopted by SGAC, May 10, 2021. <https://spacegeneration.org/wp-content/uploads/2021/12/EAGLE-Report.pdf>, p. 40, para. 3.2.9, Recommendation.

24 Effective and Adaptive Governance for a Lunar Ecosystem. Lunar Governance Report, Approved and adopted by SGAC, May 10, 2021. <https://spacegeneration.org/wp-content/uploads/2021/12/EAGLE-Report.pdf>, p. 40, para. 3.2.9, Elaboration.

national activities in outer space. National space legislation is a way to implement this commitment.

Provisions on safety zones mostly meet in the nuclear, energy, or water spheres of regulation at the national level. Curiously enough, national space legislation also contains provisions about the capability to establish zones around space objects for the safety of its space activities.

For example, Law of the Russian Federation “About Space Activity» (Decree No. 5663-1 of the Russian House of Soviets) in its Section IV “Space Infrastructure”, Article 17 “Space Object” constitutes:

The rights of jurisdiction and control over space objects, as well as of ownership thereof shall not affect the legal status of the area of outer space or the surface or subsoil of a celestial body occupied by it. In direct proximity to a space object of Russian Federation within *the zone minimally necessary for ensuring safety of space activity*, rules may be established that shall be binding for Russian and foreign organizations and citizens.

This provision shows a link between jurisdiction and control over space objects (1), ownership over space objects (2) and space activity carried out by space objects based on safety. This affirms Articles VI, VIII, and IX of the Outer Space Treaty 1967 and means, in other words, an opportunity to establish safety zones.

## 2. Conclusion

Taking all the aforesaid about safety zones into consideration, look at the doctrine of international space law. Prof. G. Zhukov and prof. Y. Kolosov, in the context of the problem on the retention by States of sovereign rights over space objects launched, wrote that:

[...] the principle of the retention of jurisdiction and control over space objects is of exceptional importance in assuring spaceflight safety. That is why Soviet legal experts have raised the question of surrounding space objects with safety zones, within which the states on whose registry the objects are carried would exercise their sovereign rights of jurisdiction and control.<sup>25</sup>

Thus, we can single out several characteristics of safety zones. The main aim of safety zones is to ensure safety during any space activities on the Moon or

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<sup>25</sup> G. Zhukov, Y. Kolosov, International Space Law. 2nd edition, stereotyped, Statut, Moscow, 2014. P. 64.

another celestial body; this flows from Article IX of the Outer Space Treaty 1967. Principles of operating by safety zones include sharing information (Art. XI), international cooperation (Art. IX), free access to all areas of celestial bodies (Art. I), and non-appropriation (Art. II) of territory over which safety zone is established.

At the same time process of establishing safety zones has many uncertainties, like the universal legal notion of a 'safety zone', period of time for its existence, size of a safety zone (will it be similar to the size of space object under which a State has jurisdiction and control, or it will be an area of lunar activity with potential harmful interference to other participants), classification of safety zones, rules for notification about safety zones, choosing a responsible body for the collecting data and sharing information about safety zones, etc. To resolve the last question the best variant will be to use the platform of the UN OOSA.

Nevertheless, to create a working mechanism of safety zones' management, it will require to draft international legal regime for the establishment and operation of safety zones. On the one hand, it could happen in the process of discussion of a future international legal regime (framework) of space resources, on the other hand, it could be some soft law document with principles and technical requirements to safety zones drafted by the UN COPUOS and its Subcommittees. Approaches of different international intergovernmental organizations and scientific projects and experience of other branches of international law will be efficient too.

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