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Committee on the Peaceful Uses of Outer Space

Questions on suborbital flights for scientific missions and/or for human transportation

Note by the Secretariat

Addendum

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Greece[1]

[Original: English]
[14 January 2022]

Question (a). Is there a relationship between plans to establish a system of space traffic management and the definition and delimitation of outer space?

The issue of the definition and delimitation of outer space could have an impact on plans to establish a system of space traffic management. However, the international community must be prepared to provide answers in this respect, even in the absence of such a definition or delimitation.

Question (b). Is there a relationship between suborbital flights for scientific missions and/or for human transportation and the definition and delimitation of outer space?

The definition and delimitation of outer space is linked with suborbital flights for scientific missions or crewed space flights. In this context, it has to be underlined that the functionalist approach to the definition and delimitation of outer space may provide greater clarity than the spatialist one, as it would result in the application of only one legal regime (i.e. space law) to suborbital flights, whose primary function is to enter outer space (despite the fact that they are also designed to traverse airspace). The functionalist approach distinguishes between aeronautical and astronautical activities on the basis of the primary purpose of a vehicle's design rather than the location of the vehicle at any single point in time. Under this approach, a company's suborbital operations would be governed under space law only (with the exception of air traffic management rules for that portion of the flight that crosses airspace), because suborbital flights are designed for space travel.

Question (c). Will the legal definition of suborbital flights for scientific missions and/or for human transportation be practically useful for States and other actors with regard to space activities?

The legal definition of suborbital flights for scientific missions or crewed space flights would be useful for States and other actors with regard to space activities, as it is closely linked with and would contribute to the setting up of a system of global space governance.

Question (d). How could suborbital flights for scientific missions and/or for human transportation be defined?

The definition of suborbital flights for scientific missions or crewed space flights has particularities, making it a complex subject that requires careful study, which we believe should be done within the competent United Nations bodies, following a wide-ranging, open consultation.

Question (e). Which legislation applies or could be applied to suborbital flights for scientific missions and/or for human transportation?

The choice whether to apply international or national law is related to the content of the definition of suborbital flights and to the specific characteristics of the flight.

Question (f). How will the legal definition of suborbital flights for scientific missions and/or for human transportation impact the progressive development of space law?

We consider that it will have a significant impact on the development of space law, and that the extent of the impact is directly related to the content of the definition of suborbital flights for scientific missions and crewed space flights.

[1] Greece provided replies to questions (a), (b), (c), (d), (e) and (f).

Morocco

[Original: French]
[24 January 2022]

Question (a). Is there a relationship between plans to establish a system of space traffic management and the definition and delimitation of outer space?

Space traffic management is dependent on the definition and/or precise delimitation of outer space.

Question (b). Is there a relationship between suborbital flights for scientific missions and/or for human transportation and the definition and delimitation of outer space?

There is no relationship between the definition and/or delimitation of outer space and suborbital flights because such flights enter outer space only briefly and never end their trajectory in an orbit.

Question (c). Will the legal definition of suborbital flights for scientific missions and/or for human transportation be practically useful for States and other actors with regard to space activities?

The legal definition of suborbital flights for scientific missions and/or for human transportation will not be useful to States or private actors in the space sector. However, the elaboration of an international legal framework applicable to such flights may be of interest to States and the private space sector. Such an international legal framework, the purpose of which would be to ensure legal certainty, would enable all actors (public and private) to take appropriate decisions ensuring the success of any programmes that they wished to implement in that area, taking into account, for example, aspects relating both to liability and to registration.

Question (d). How could suborbital flights for scientific missions and/or for human transportation be defined?

It is difficult to develop a definition of "suborbital flight" that is legally acceptable at the international level, as such flights can be defined in different ways. Several approaches may be considered, such as the approach based on altitude or that based on the type of mission concerned (scientific, transportation, etc.), or the functional approach, which consists in determining whether the management of an orbital flight would fall under the umbrella of air traffic or space traffic. It would therefore be wise to explore the possibility of establishing a definition that would reflect all of these considerations.

Question (e). Which legislation applies or could be applied to suborbital flights for scientific missions and/or for human transportation?

Since suborbital flights are of a hybrid nature, international space law (the five treaties), customary international law and air law are applicable.

Question (f). How will the legal definition of suborbital flights for scientific missions and/or for human transportation impact the progressive development of space law?

The legal definition of suborbital flights for scientific missions and/or for human transportation could undoubtedly facilitate the progressive development of the space law framework.

Question (g). Please propose other questions to be considered in the framework of the legal definition of suborbital flights for scientific missions and/or for human transportation.

(a) How can a definition of suborbital flights be formulated in such a way that it allows for new technological developments?

(b) Can the treaties relating to liability and registration be applied directly in order to ensure both the safety of operations relating to suborbital flights and the safety of States in case of damage caused by such flights?

Philippines[2]

[Original: English]
[26 January 2022]

Question (a). Is there a relationship between plans to establish a system of space traffic management and the definition and delimitation of outer space?

Plans to establish a system of space traffic management may benefit from the definition and delimitation of outer space, which would bring clarity and security to the application of "space traffic rules" that may be implemented at a later stage by space traffic management systems. This definition may also assist in harmonizing the mandates of various government agencies and departments and allow these actors to work towards ensuring the safe and responsible conduct of space activities.

Question (b). Is there a relationship between suborbital flights for scientific missions and/or for human transportation and the definition and delimitation of outer space?

Suborbital flights for scientific missions and/or for human transportation may need to be regulated at both the national and international levels. This regulation may require the definition and delimitation of outer space in order to draw the line between the application of air law and the application of space law. Any definition or delimitation of outer space must be responsive to advances or changes in technology relevant to suborbital flights for scientific missions and/or human transportation.

Question (c). Will the legal definition of suborbital flights for scientific missions and/or for human transportation be practically useful for States and other actors with regard to space activities?

A legal definition of suborbital flights for scientific missions and/or for human transportation may aid in the creation of a legal regime regulating the movement of space objects. This definition may also be helpful in distinguishing and coordinating between the activities of the aviation and space sectors and in identifying responsibility and/or liability for these activities. Any definition of suborbital flights for scientific missions and/or human transportation must be responsive to advances or changes in technology relevant to this matter.

Question (d). How could suborbital flights for scientific missions and/or for human transportation be defined?

Suborbital flights for scientific missions and/or for human transportation may be defined by identifying the purpose of the flight and its target and/or actual destination.

Question (e). Which legislation applies or could be applied to suborbital flights for scientific missions and/or for human transportation?

The Philippines does not currently have any national legislation applicable to suborbital flights for scientific missions and/or for human transportation. However, with regard to international legislation, the following treaties may be applicable:

(a) The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, in that there must be freedom of exploration and scientific investigation, which must be conducted for the benefit and interest of all humankind and for the maintenance of international peace. The Philippines is a signatory to but has not yet ratified the Treaty.

[2] The Philippines provided replies to questions (a), (b), (c), (d), (e) and (f).

(b) The Convention on Registration of Objects Launched into Outer Space, in that when a space object is launched into Earth orbit or beyond, the launching State must register the object. The Philippines is a signatory to but has not yet ratified the Convention.

Question (f). How will the legal definition of suborbital flights for scientific missions and/or for human transportation impact the progressive development of space law?

The legal definition of suborbital flights for scientific missions and/or for human transportation may assist in establishing a foundation for the creation of laws governing the commercialization of outer space, the international responsibility of States in the conduct of their space activities and the indispensable participation and responsibilities of the private space sector. Any definition of suborbital flights for scientific missions and/or human transportation must be responsive to advances or changes in technology relevant to this matter.

Saudi Arabia

[Original: Arabic]
[26 January 2022]

Question (a). Is there a relationship between plans to establish a system of space traffic management and the definition and delimitation of outer space?

The suborbital flights for scientific and human space transport activities currently being developed are directly related to the definition and delimitation of outer space.

Question (b). Is there a relationship between suborbital flights for scientific missions and/or for human transportation and the definition and delimitation of outer space?

Suborbital flight involves a space transport system (a space object or vehicle) that operates between air space and outer space at very high altitude without reaching orbit. As indicated in the discussions of the Committee on the Peaceful Uses of Outer Space regarding some of the member States' space activities and the scientific and technical progress and innovation which they have achieved, the concept of suborbital flights has recently emerged with the advent of commercial human space flights and investments in space and air transport. This new field benefits from the application of space science and technology to international flight operations. Some member States are developing suborbital flights for scientific, commercial or human-transport purposes. This has given rise to a need to develop international provisions on commercial space transport. Those provisions should take into account the fundamental difference between the requirements of international air law and those of international space law, as well as differences between current air traffic control systems and future systems for managing space traffic and registering objects.

Question (c). Will the legal definition of suborbital flights for scientific missions and/or for human transportation be practically useful for States and other actors with regard to space activities?

Yes, it will be practically useful, because it will regulate activities.

Question (d). How could suborbital flights for scientific missions and/or for human transportation be defined?

There is no international consensus on a definition because of the mixed nature of suborbital flights. Such flights could be defined by applying air or space law, with preference given initially to a scientific description. Alternatively, new legal instruments covering this area could be developed on the basis of a consensus among States.

Question (e). Which legislation applies or could be applied to suborbital flights for scientific missions and/or for human transportation?

This activity could be regulated by international law, taking into account the location of the activity and national legislation governing the activity. It would be useful for the States and local bodies that conduct space activities to be informed about the legal framework applicable to their activities.

Question (f). How will the legal definition of suborbital flights for scientific missions and/or for human transportation impact the progressive development of space law?

The space environment and the aerospace environment of suborbital flights must be considered in the progressive development of space law. An agreement on the definition of suborbital flights will create a common concept, which will facilitate managing space traffic in the future and dealing with the legal challenges associated with these activities.

Question (g). Please propose other questions to be considered in the framework of the legal definition of suborbital flights for scientific missions and/or for human transportation.

What are the technical and legal matters that must be considered regarding suborbital flights, and how can the broad ambitions or benefits of scientific initiatives and innovations be balanced with the problems they may cause in the space and air environment?

III. Replies received from permanent observers of the Committee

Space Generation Advisory Council

[Original: English]
[14 January 2022]

Question (a). Is there a relationship between plans to establish a system of space traffic management and the definition and delimitation of outer space?

Yes. The legal end of airspace is the boundary to consider when creating rules of the orbital road for space activities and space law. Air and space have fundamental legal differences, the most pertinent of which is that airspace above sovereign territory is also sovereign, whereas outer space is not subject to appropriation. Space traffic management plans must therefore include a uniform boundary and rules to respect the equality of States under international law, unless agreed otherwise by consensus. The practicalities of future upper airspace and near-space traffic management may, however, require aerospace regulatory integration, both domestically and internationally, in order to coordinate hazard response and debris mitigation.

Question (b). Is there a relationship between suborbital flights for scientific missions and/or for human transportation and the definition and delimitation of outer space?

Yes. The spatialist approach, which proposes a clear demarcation between airspace and outer space, entails a definition of suborbital flight based on its capacity to reach a certain altitude. Under this approach, it is essential to delimit the two domains in order to locate the activity and identify the applicable legal regime. However, the approach does not consider the velocity of a suborbital vehicle and therefore its ability to reach orbit.

Alternatively, a functionalist approach requires a suborbital vehicle and its flight to be regarded as an activity. In this case, there is no substantial relationship between the delimitation and definition of airspace and outer space, since the applicable legal regime is determined regardless of a suborbital vehicle’s location.

Question (c). Will the legal definition of suborbital flights for scientific missions and/or for human transportation be practically useful for States and other actors with regard to space activities?

As illustrated by the previous answer, it will depend on the approach adopted. If a spatialist approach is adopted, the delimitation between airspace and outer space will have significant practical utility, as it will steer the choice of the applicable legal regime between air law and space law. In this regard, a more complicated matter is the application of responsibility and liability regimes. Under this approach, a suborbital flight would require the application of two different legal regimes. Under air law, States are responsible for aviation safety in their national airspace. A suborbital flight would fall under a regime of national responsibility while it was located in airspace. In contrast, once the flight reached outer space, it would be subject to the legal regime established by 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 Convention on International Liability for Damage Caused by Space Objects with regard to responsibility and liability deriving from space activities. Therefore, it would be necessary to identify the multiple launching States liable for any damage for the portion of the activities conducted in outer space.

Question (d). How could suborbital flights for scientific missions and/or for human transportation be defined?

Suborbital flights can be defined as flights that can reach outer space (altitudes of 100 km or more above sea level), but at a velocity equal to or less than orbital velocity, which is not sufficient to orbit Earth. These flights could be also defined on the basis of their functionality, mission purpose and design, in order to understand their impact on applicable air or space regulations.

Question (e). Which legislation applies or could be applied to suborbital flights for scientific missions and/or for human transportation?

Domestic air and space law, according to the respective approaches of States to delimitation. International civil aviation law (United Nations treaties and bilateral, multilateral and regional air service agreements) may be adapted to accommodate civil suborbital human transportation, or international space law may apply. Bilateral, multilateral or regional agreements on scientific cooperation may also apply.

Question (f). How will the legal definition of suborbital flights for scientific missions and/or for human transportation impact the progressive development of space law?

The legal definition of suborbital flights will affect the determination of applicable law. Legally, certainty regarding applicable law will then affect registration requirements for suborbital vehicles, liability rules and criteria for transferring ownership of such vehicles. The definition of these activities thus has the potential to harmonize national regulatory approaches to suborbital activities, both domestically and internationally, through further bilateral or multilateral agreements.

Question (g). Please propose other questions to be considered in the framework of the legal definition of suborbital flights for scientific missions and/or for human transportation.

(a) What is the role of the International Civil Aviation Organization and domestic airspace regulations in the regulation of suborbital flights for scientific or human transportation purposes?

(b) What are the legal solutions for dealing with the entry into airspace of orbital debris while at the same time respecting territorial sovereignty and achieving sustainability in space activities?

(c) What legal solutions may be adapted to the fluctuating nature of technology applied to suborbital flights, such as artificial intelligence?

United Nations Development Programme

[Original: English]
[22 December 2021]

Space technologies have become significant enablers of communication and of Earth observation, defined as the gathering of information about the physical, chemical, and biological systems of the planet through remote sensing technologies. Space data now support our programmes in almost all 170 of our country offices, including in the preparation of our *Human Development Report* and many analyses on the impacts of climate change. Although we do not have detailed proposals that would support a definition of outer space or how to manage space and suborbital activities, the United Nations Development Programme (UNDP) supports the principles set out below for consideration by the Committee on the Peaceful Uses of Outer Space.

Open data

Earth observation data should remain accessible to all citizens and organizations, free of charge or at a reasonable cost, since they contribute to development, mitigating the impact of climate change, studying migrations, understanding the evolution of inequalities, etc. Any organization launching satellites and scientific missions in space should commit itself to an open data policy, to which UNDP will be happy to contribute.

Protecting our atmosphere

We are glad to see that space and suborbital flights are becoming more accessible, also to private companies, and will continue to foster innovation and benefit humankind. We also see that these technologies are intensively using fossil fuels and polluting our atmosphere. In these days of climate emergency, we strongly encourage the Committee to establish a framework that protects our atmosphere and limits pollution by non-essential space and suborbital activities, while at the same time preserving scientific missions.

Access to space and suborbital flights for all nations

Many countries do not have a space agency and are not yet able to launch satellites or space missions. We hope that future laws governing space will ensure that countries will still have free access to space. Every nation must have an equal opportunity to launch missions and satellites into orbit, and UNDP supports mechanisms that will ensure that no Government or commercial entity can pre-empt the right to access space.

Access to space and suborbital technologies for United Nations missions

We see that access to space is easier and more affordable, including experimentation with pseudo-satellites or high-flying drones. We see potential in the near future for the United Nations to use these technologies to better coordinate the responses to crises and to accelerate the delivery of help to people in need. We recommend that the Committee start establishing a framework that allows the United Nations and its partners to be authorized rapidly to use modern space and suborbital technologies, especially in crisis situations.