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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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II. Replies received from Member States

Austria

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Question (i). 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 are generally described as flights up to a very high altitude that do not involve sending the vehicle into orbit.¹

The hybrid nature of suborbital flights raises the question — so far unresolved — of whether air law or space law is applicable to regulate them. The establishment of a definition and delimitation of outer space does not seem to solve this question as the flights will continue to be partly carried out in airspace and partly in outer space.

Question (ii). 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 definition of suborbital flights for scientific missions and/or for human transportation could be a first step towards the discussion of the nature of the legal regime applicable to them at the international level. This would be beneficial for States in the development of rules to control and supervise these activities at the national level.

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

So far no international definition of suborbital flight has been agreed. In view of ongoing technological development, a commonly accepted, legally binding definition at the international level seems difficult to achieve. Under these circumstances, the development of a non-binding description could be a practical option, which would also have the advantage of being adaptable to future technological innovation.

The International Civil Aviation Organization (ICAO) describes a suborbital flight as “a flight up to a very high altitude which does not involve sending the vehicle into orbit” (see above). Based on this description and until an internationally agreed definition or description is found, a generally acceptable formulation could be “a flight up to a very high altitude without completing one or several orbits around the Earth”.

In view of the fact that such flights can reach very high altitudes, such as 1,000 km, the term “suborbital” does not necessarily seem appropriate. It creates the impression that such flights are taking place below (low) Earth orbit. Perhaps a discussion could be started on developing a new term that would avoid this impression.

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

Given the hybrid character of suborbital flights, international space law (in particular 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 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of 1968, the Convention on International Liability

¹ Paragraph 1.2 of the International Civil Aviation Organization (ICAO) working paper contained in [A/AC.105/C.2/2010/CRP.9](#).

for Damage Caused by Space Objects of 1972 and the Convention on Registration of Objects Launched into Outer Space of 1974), international air law (including the Convention on International Civil Aviation of 1944, the Convention for the Unification of Certain Rules Relating to International Carriage by Air of 1929, the Convention for the Unification of Certain Rules for International Carriage by Air of 1999 and the Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface of 1952) and customary international law and national laws could be applied.

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

A commonly accepted definition or description of suborbital flights, together with a clarification of the applicable legal rules at the international level, could generate a common understanding on how to address the legal challenges connected to these activities. This could provide guidance for the development of national space legislation relating to suborbital flights. In addition, it could facilitate the development of a comprehensive space traffic management system and foster the commercialization of this sector.

Question (vi). 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) Which legal rules should be applied to suborbital flights?
- (b) What would be the consequences for safety, registration, insurance and liability if air law or space law were applied?
- (c) How can a definition of suborbital flights be formulated in a way that is flexible enough to adapt to new technological developments?
- (d) How will human transportation (space tourism) activities be certified?
- (e) Which organization could take care of space traffic management? Currently, there is no civil public authority responsible for world space traffic (equivalent to ICAO for airspace).

III. Replies received from permanent observers of the Committee

International Law Association²

[Original: English]

[3 February 2017]

A conference room paper on the matter was submitted by the Chair of the Space Law Committee of the International Law Association (ILA) to the Legal Subcommittee at its fifty-fifth session, in 2016.³ In that paper, the development of suborbital flight issues within the Space Law Committee in 2014-2015 was described. The present document, following the ILA seventy-seventh Conference in Johannesburg, South Africa, in August 2016,⁴ refers to new developments in the field reflected in the working session of the Conference, after having been the object of deep analysis.

² Further replies and updates from the Chair of the Space Law Committee of the International Law Association (ILA).

³ [A/AC.105/C.2/2016/CRP.10](#).

⁴ The report on the meeting of the Space Law Committee held in Johannesburg, South Africa, from 7 to 11 August 2016 is available at www-ila-hq.org: click on “committees” and “space law”. It will shortly be made available in book format (published by the International Law Association, London).

The Johannesburg discussion was an update of the report submitted to the Seventy-Sixth ILA Conference (held in Washington, D.C., in 2014). It carried forward the discussion on the definition and description of suborbital flight, the current concepts for suborbital reusable launch vehicles, projects under way, applicable law, the liability regime and perspectives for suborbital industry markets.

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

On that occasion it was noted that neither international agreements on suborbital flights nor a legally binding demarcation between airspace and outer space had been achieved so far, in spite of the continuing efforts in various circles. There were initiatives from ICAO, the International Telecommunication Union and the Office for Outer Space Affairs of the Secretariat, among others, which at times reflected an understanding of the interaction between the uses of airspace and outer space.

It was also noted that the link between suborbital flights for scientific missions and/or for human transportation, on the one hand, and the definition and delimitation of outer space or a legally binding definition of suborbital flights on the other, had yet to be adopted. Moreover, the definition suggested by ICAO — a flight up to a very high altitude not sending the vehicle into orbit — had not been accepted in any legally binding document, national or international. The main characteristics of those flights were that they were parabolic flights, and that they had no full orbital rotation. They involved vertical take-off, vertical landing and horizontal take-off, horizontal landing. The most relevant current projects were Virgin Galactic, XCOR, Blue Origin, Masten Space Systems and UP Aerospace. Virgin Galactic and XCOR (vertical take-off, vertical landing-based) were among the most successful flights of the kind. Furthermore, there was no agreement on terminology issues. In fact, some of the ILA Space Law Committee members suggested renaming “suborbital flights” as “non-orbital flights”, in the interest of precision.

Question (ii). 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 current view of ILA, as reflected at the above-mentioned Johannesburg Conference, is that linking the legal aspects of suborbital flight to delimitation issues would mean going round in circles and would hinder progress in the field. Rather, at this point in time, attention should be paid to the doctrine and to continuing to analyse State practice together with the development of the industry. Delimitation issues should not turn into a barrier to the development of national and international legislation on suborbital flight. Moreover, there is no political will in this sense. There seem to be high hopes that the delimitation issues, in the meantime, would gradually be sorted out by means of customary international law, as was the case in the law of the sea concerning the width of territorial waters.

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

As to definitions, or a possible scientific description of suborbital flight, the latter course of action appears preferable to the majority, at least in these early stages. The reason is that definitions tend to set limits and restrictions, whereas descriptions are usually non-exhaustive. The drafting of guidelines for a model law seems the best option today, as State practice is expected to increase. Along these lines, ILA has now embarked on the preparation of an international instrument of that kind; a first draft will be submitted to its next biennial conference, which will be held in Sydney, Australia, in August 2018. We shall, naturally, continue informing the Legal Subcommittee on the progress of this initiative.

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

At the national level, some legal rules have already been adopted. Australia has set 100 km as the boundary between airspace and outer space and the United States of America has specific regulations, issuing permits via the Federal Aviation Administration. Belgium has excluded suborbital flights from the scope of space law, the United Kingdom of Great Britain and Northern Ireland has established a task force under its Civil Aviation Authority and in Germany, all craft within airspace are aircraft.

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

As to State practice, replies to a questionnaire circulated by the ILA Space Law Committee Rapporteur for further clarification were received from Australia, France, India and Japan. France and Japan were involved in suborbital projects. Australia, France and Japan had legislation on the matter. Australia saw no immediate need for specific legislation. France considered that air law should apply in the first place and that a sui generis framework could be set up later. India was in the process of drafting its national space legislation, which did not seem to include suborbital flights. Japan was enacting a national space activity act, and would not be including suborbital flights in future legislation as it saw no need for their regulation at the current stage.

State practice has showed, so far, that most relevant national laws — without specifically regulating suborbital flights — considered them within the air law regime. National legislation rarely addressed such flights. In 2008, the European Space Agency stated that human suborbital flights should be considered as high-altitude aeronautics and the European Aviation Safety Agency placed civil suborbital operations under the competences and certification of the Agency.

Question (vi). 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.

Air and space law liability rules are not directly applicable to suborbital flight. Rules will probably evolve from national initiatives and detailed solutions are required because of the investment scope and high risk of aerospace activities. Proposals would have to deal with the creation of a (sui generis) contractual liability regime (fault-based limited liability) for suborbital flights, which could profit from early experience in the aviation field.

The ILA Committee Rapporteur considered that a new spaceflight industry might develop, as an increase in the demand for suborbital services was expected. International suborbital flights are likely to pose challenges to national sovereignty and the applicability of certain freedoms of the air as established by the Convention on International Civil Aviation of 1944 and complementary agreements. Technological solutions were also needed to minimize failure. Air traffic control would have to deal, at both the national and international levels, with the creation, coordination and monitoring of spaceport standards and logistic infrastructure guaranteeing air safety mechanisms.

The ILA members had a debate surrounding the need — or not — to register suborbital flight, as they did not meet the criteria of article IV of the Registration Convention. That point was considered most important for reasons of identification in cases of liability for damage as they could become a threat to space objects in the low orbits. As to liability, non-orbital flights could, if operated frequently, pose a threat to space objects in the low orbits. In case of damage, the Liability Convention should

apply. Regarding the impact of those activities on the space environment, it was important to bear in mind the principle of precaution and to avoid harmful interference with the space activities of other States.

Overall, in the two years between the ILA Washington, D.C., Conference and the Johannesburg Conference in 2016, and since the conference room paper on the matter submitted to the Legal Subcommittee in 2016, there had not been much progress on the achievement of legally binding rules for suborbital operators. However, technological progress and the increasing number of successful test flights will probably convert suborbital flights into a working market. In that framework, space tourism would possibly be the most highly marketed aspect of suborbital activities. A detailed legal approach would be necessary for reasons of clarification. The yet-unresolved legal issues should be further addressed for inclusion at the time of drafting the announced guidelines for a model law on suborbital activities. These guidelines should develop specific aspects and include others relating to suborbital transportation, such as air safety, air and space traffic management, infrastructural legal problems of spaceports and air and suborbital traffic coordination.
