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**Committee on the Peaceful
Uses of Outer Space**

Questionnaire on possible legal issues with regard to aerospace objects: replies received from member States

Note by the Secretariat

Addendum

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I. Introduction

1. At its thirty-eighth session, in 1995, the Committee on the Peaceful Uses of Outer Space agreed that the purpose of the questionnaire on possible legal issues with regard to aerospace objects that had been finalized at the thirty-fourth session of the Legal Subcommittee was to seek the preliminary views of States members of the Committee on various issues relating to aerospace objects. The Committee also agreed that the replies to the questionnaire could provide the basis for the Legal Subcommittee to decide how it might continue its consideration of the related agenda item. The Committee further agreed that States members of the Committee should be invited to give their opinions on those matters.¹
2. Information received from member States by 21 January 2004 is contained in the note by the Secretariat (A/AC.105/635 and Add.1-10).
3. At its forty-third session, in 2004, the Legal Subcommittee endorsed the report of the Working Group on Matters Relating to the Definition and Delimitation of Outer Space. The Working Group agreed that member States that had not yet replied to the questionnaire on aerospace objects should be invited to do so (A/AC.105/826, annex II, para. 9).
4. The present document was prepared by the Secretariat on the basis of information received by 7 January 2005 from the following member States: Finland, Lebanon, Portugal, Rwanda, Turkey and Ukraine.

II. Replies received from member States*

Question 1. Can an aerospace object be defined as an object which is capable both of travelling through outer space and of using its aerodynamic properties to remain in airspace for a certain period of time?

Finland²

[Original: English]

No, an “aerospace object” cannot be defined as having the aforesaid properties, as the term “aerospace objects” may include aerospace signals, natural cosmic particles that enter the Earth’s atmosphere, a defunct aerospace vehicle, robots, products resulting from the joint application of space technology and Earth science (aerospace product) and even aerospace infrastructure. An “aerospace vehicle” is just one of many “aerospace objects”, but if a definition is sought for “aerospace vehicle” or “aerospace craft”, then it is acceptable, provided that the expression “to remain in outer space for a certain period of time” is replaced with “to travel through airspace”. An “aerospace vehicle” could thus be defined as an

* The replies are reproduced in the form in which they were received.

¹ See *Official Records of the General Assembly, Fiftieth Session, Supplement No. 20 (A/50/20)*, para. 117.

² The responses of Finland should be read in conjunction with the explanatory memorandum attached to the present document as an annex.

aerospace object that is capable of “travelling through” outer space and using its aerodynamic properties while travelling through airspace.

Portugal

[Original: Spanish]

The proposed definition of an aerospace object is of a general nature and conveys a broad and unified concept that must be distinguished from those of “aircraft”, “spacecraft” and “space object”, which appear in the United Nations conventions on international space law. These differing concepts may be subject to different regimes. Furthermore, the phrase “for a certain period of time” is also very general in nature. Thus, in the interests of safety and credibility, these legal definitions need to be more precise.

Rwanda

[Original: French]

Rwanda considers that the definition of an aerospace object is of particular importance given that no such definition is set out in existing conventions or treaties. While the proposed definition refers to the dual capability of the aerospace object to travel through outer space and to remain in airspace for a certain period of time, it fails to determine the purposes that an aerospace object can serve or to highlight the distinction between aerospace and other objects such as meteorites, namely, that the aerospace object can be subject to human control at any altitude as regards its direction and speed.

Turkey

[Original: English]

The suggested definition of an aerospace object is acceptable, insofar as the aerospace object is performing a space mission. To make this statement clear and also to prevent misinterpreting of the expression “remain in airspace”, the definition should be replaced with the following definition:

“An ‘aerospace object’ is an object that is capable both of travelling through outer space and of using its aerodynamic properties to move in airspace for a certain period of time for exclusively space purposes.”

Ukraine

[Original: Russian]

1. An aerospace object can, in principle, be defined in this way, although the term “aerospace object” is found neither in international legal documents nor in scientific and technical literature relating to the flight of craft whether in airspace or outer space.
2. Since the chief purpose of the aerospace object is its use in outer space, the definition of the term “aerospace object” should be established in consultation with the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space.

Question 2. Does the regime applicable to the flight of aerospace objects differ according to whether it is located in airspace or outer space?

Finland²

[Original: English]

Considering the present state of laws, the regime applicable to “aerospace vehicles” differs according to whether a vehicle is “travelling through” airspace or outer space, but it is possible to envisage a new adaptive “purpose-based” regime.

Portugal

[Original: Spanish]

1. No. Space objects are governed by the principles set out in the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (General Assembly resolution 2222 (XXI), annex), in accordance with which they are subject to the customary rule that establishes the right to innocent (free and peaceful) passage. The launch of Sputnik I introduced a new dimension to the principle of freedom of exploration and use of outer space (enshrined in article 1 of the Treaty), namely that of freedom of movement. Experience has demonstrated the inalienability of sovereign rights over objects or vehicles to be one of the fundamental rules of customary space law.³ Thus it may be concluded that freedom to launch space objects and vehicles and freedom of movement already fall within the scope of the principle of freedom established under the Treaty.⁴

2. The problem lies in the broad scope of these principles in relation to space objects. Portugal considers that the passage of an aerospace object through airspace, that is, in transit only, is subject to international space law. However, if the object is an aircraft moving between airspace and outer space, international air law should apply from the moment the object enters airspace (see response to question 6).

3. In view of the importance of clarifying the regime applicable to innocent passage through airspace, the relevant international norms should be formulated and clarified as a matter of urgency and based on the model provided by the law applicable to innocent passage through territorial waters.

Rwanda

[Original: French]

1. The airspace of a State forms part of the territory of that State. Therefore, any aerospace object passing through such territory usually falls within the jurisdiction of the State in question.

³ See I.H.Ph. Diederiks-Verschoor, *An Introduction to Space Law*, 2nd rev. ed. (The Hague, Kluwer Law International, 1999), pp. 11 and 12.

⁴ For further reading, see Pablo Mendes de Leon, “Unilateral efforts designed to enhance security in the context of international law”, *The Use of Air and Outer Space: Cooperation and Competition*, Chia-Jui Cheng, ed. (The Hague, Kluwer Law International, 1998), p. 291, note 4.

2. An aerospace object located in outer space is subject to the law of the State where it was registered.

Turkey

[Original: English]

If an aerospace object operated in areas subject to the jurisdiction of a State, it would be subject to the laws of that State and international air law, but if the passage of an aerospace object through the airspace of another State was part of its direct passage to or from outer space during launch or return for landing where the purpose is to perform exclusively space activities and the exploration of outer space and was only incidental thereto, it would be subject to the principles of international space law.

Ukraine

[Original: Russian]

The regime applicable to flight depends on the purpose of the mission of an aerospace object. The regime of air law should apply throughout the duration of flight of craft used for Earth-to-Earth transport of materials or persons. Where the purpose of the mission of an aerospace object is the exploration and use of outer space, the regime of space law should prevail throughout the duration of the mission.

Question 3. Are there special procedures for aerospace objects, considering the diversity of their functional characteristics, the aerodynamic properties and space technologies used, and their design features, or should a single or unified regime be developed for such objects?

Finland²

[Original: English]

At present, there are no existing legal procedures for aerospace vehicles. Developing a new regime is possible and would be viable only if air/outer spaces were demarcated. Once this was done, then with a “purpose-based approach”, an adaptive new regime could be developed within the existing air and space law frameworks, while at the same preserving and upholding their normative values.

Portugal

[Original: Spanish]

While the definition of space objects may be based on a single criterion (in which case a single legal regime would apply), the differences in their technological features may call for the adoption of differing criteria to be set out in specific legislation incorporated in international law promulgated by the United Nations. It is therefore vital to carry out an in-depth study of the characteristics of such objects from a technical perspective.

Rwanda

[Original: French]

Rwanda is not aware of any special procedures for aerospace objects. It would appear that this has posed no problems to date, since the United States Space Shuttle does not pass through foreign territory, re-enters the Earth's atmosphere above open sea and can land on United States territory. In the interest of seeking satisfactory solutions, this question should be dealt with in relation to some specific problem that could arise.

Turkey

[Original: English]

The regime should be developed following in-depth study, since advances in aerospace technology could mean that in future a specific regime would need to be established to take into account situations not considered under current international air and space law. Such a regime could also help identify aerospace objects and their legal status without violating current air and space law.

Ukraine

[Original: Russian]

No special procedures are broadly applied. However, Ukraine considers that, should the number of such objects increase, potentially giving rise to a range of issues regarding their functioning, it will be necessary to amend and develop the norms of air and space law in order to take into account the distinctive features of aerospace objects.

Question 4. Are aerospace objects while in airspace considered as aircraft, and while in outer space as spacecraft, with all the legal consequences that follow therefrom, or does either air law or space law prevail during the flight of an aerospace craft, depending on the destination of such a flight?

Finland²

[Original: English]

Aerospace vehicles cannot be considered either aircraft or spacecraft when they are in their respective domains. They can be considered only as aerospace craft. A "destination-based" approach is possible when air and space law are adequately adapted to meet the requirements of aerospace craft and both domains are clearly demarcated.

Portugal

[Original: Spanish]

Objects should not be classified according to their location at a given time. We consider that the fundamental criterion is that of the purpose or destination of the

object. Assuming that the destination is outer space, the object should be considered a spacecraft and therefore subject to space law during the entire flight (see response to question 2).

Rwanda

[Original: French]

Rwanda considers that an aerospace object passing through the airspace of a State is subject to the jurisdiction of that State and while in outer space it is subject to space law, that is, it falls within the jurisdiction of the State where it was registered.

Turkey

[Original: English]

The purpose and the destination of aerospace objects are important factors in determining whether an object should be considered an aircraft or an aerospace object. Aerospace objects flying in airspace, especially through another State's territorial airspace and performing an air mission, even if they were flying for a certain period in outer space, would continue to be considered aircraft. Similarly, aerospace objects flying through airspace for the purpose of their ascent or descent from outer space would be considered spacecraft.

Ukraine

[Original: Russian]

During flight, aerospace objects may be considered to fall within the scope of international space law or international air law, depending on the purpose of the mission. The development of aerospace technology may necessitate the amendment of prevailing norms of international air and space law.

Question 5. Are the take-off and landing phases specially distinguished in the regime for an aerospace object as involving a different degree of regulation from entry into airspace from outer space orbit and subsequent return to that orbit?

Finland²

[Original: English]

This question is immaterial.⁵

Portugal

[Original: Spanish]

The take-off and landing phases are distinguished, but for the purpose of clarifying the regime governing the flight of aerospace objects (in accordance with the principle of freedom and of the peaceful use of outer space as established in the

⁵ See the annex for an explanation of this answer in the explanatory memorandum (questions 1-4).

1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies), the two phases need not be considered as subject to different legal regimes, since the distinction is of a technical nature. However, the two phases should be subject to space law rather than air law.

Rwanda

[Original: French]

Since there are no norms of international law applicable to this question, Rwanda is unable to provide a response.

Turkey

[Original: English]

The phases should be distinguished, in particular in the case of an aerospace object that was capable of taking off and flying as an aircraft, including launching itself into outer space from airspace and subsequently operating as a spacecraft; also in the case of an object launched into outer space that, after re-entry into the Earth's atmosphere, could operate independently as an aircraft and thereby delay its landing.

Ukraine

[Original: Russian]

All phases of Earth-orbit missions should be fully subject to space law. The regime of air law should apply to craft that temporarily enter outer space during Earth-to-Earth missions to transport materials or persons.

Question 6. Are the norms of national and international air law applicable to an aerospace object of one State while it is in the airspace of another State?

Finland²

[Original: English]

Fundamental principles of air law would be applicable to an aerospace vehicle of one State while in the airspace of another State, but considering the diverse jurisprudential base of air law and space law, the range of its applicability must be rationally determined. The most crucial elements would be the principles of national sovereignty over airspace and freedom in outer space activities. Principles of liability, state responsibility, criminality and so on would also require consideration.

Portugal

[Original: Spanish]

The first issue that this question raises is that of the destination of the flight. If the aerospace object is simply in transit between Earth and outer space, international space law should apply. However, it is important to consider problems arising in

relation to the security of the State over which the aerospace object passes or in which it takes off or lands. In order to ensure that the norms of international law reflect such issues while taking into account the principle of free passage, it will therefore be necessary to negotiate and conclude international agreements in order to guarantee the rights of States in relation to security, environmental protection and pollution (see response to question 2).

Rwanda

[Original: French]

Yes: see response to question 2. If an aerospace object is located in the airspace of a State, it is subject to the jurisdiction of that State, whereas if it is located in international airspace, the principle of nationality applies, that is, the jurisdiction of the State where the object was registered.

Turkey

[Original: English]

Aerospace objects travelling through airspace should be regarded as aircraft and therefore the norms of national and international air law would be applicable to an aerospace object of one State while it was in the airspace of another State.

Ukraine

[Original: Russian]

The norms of national and international air law will apply only during Earth-to-Earth missions of aerospace objects, but not to aerospace objects that are intended for the exploration and use of outer space.

Question 7. Are there precedents with respect to the passage of aerospace objects during take-off and/or re-entry into the Earth's atmosphere and does international customary law exist with respect to such passage?

Finland²

[Original: English]

1. There are no precedents in Finland in this regard, although there are precedents in some other parts of the globe. None of these concern "aerospace vehicles" (as strictly defined), however. The fall of Cosmos 954, the re-entry of Skylab, the Shuttle disintegrations, the splash-down of Mir and other related incidents pertain to the passage of "space objects" upon re-entry into the Earth's atmosphere.

2. No international customary law exists with respect to the passage of an "aerospace vehicle", though for a "space object" there are principles like rescue of astronauts, assist and return of space objects, mutual assistance and cooperation in the peaceful uses and exploration of outer space, good neighbourliness, absolute liability for damage caused and so on.

Portugal

[Original: Spanish]

As indicated above, customary law provides for innocent and free passage. However, it is important, taking into account the reply to question 6, to consider the possibility of amending the 1972 Convention on International Liability for Damage Caused by Space Objects (General Assembly resolution 2777 (XXVI), annex) with a view to clarifying the provisions governing liability for damage resulting from lawful activities.

Rwanda

[Original: French]

With the exception of a single case in which a Russian space shuttle passed through Turkish airspace, which did not present any legal problems (assuming that prior negotiation had taken place between the two States), Rwanda is not aware of any precedent with respect to the passage of aerospace objects through the Earth's atmosphere. There is no international customary law with respect to such passage.

Turkey

[Original: English]

There are precedents with respect to the passage of aerospace objects during take-off and/or re-entry into the Earth's atmosphere and international practice exists as regards furnishing the States whose territories are to be overflown with relevant information. Yet international practice regarding the right of passage for an ascending or descending aerospace object has not sufficiently proved to be evidence of a general practice accepted as law and therefore does not constitute international customary law.

Ukraine

[Original: Russian]

To date there are no precedents with respect to the passage of aerospace objects during take-off and/or re-entry into the Earth's atmosphere and no international customary law exists with respect to such passage.

Question 8. Are there any national and/or international legal norms with respect to the passage of aerospace objects during take-off and/or re-entry into the Earth's atmosphere?**Finland²**

[Original: English]

The answer has already been given in question 7.

Portugal

[Original: Spanish]

In Portugal there are no national legal norms relating specifically to space law.

Rwanda

[Original: French]

Rwanda is not aware of any national or international legal norms applicable to the passage of aerospace objects following re-entry into the Earth's atmosphere.

Turkey

[Original: English]

As far as the relevant articles of the Turkish Civil Aviation Code are concerned, space objects moving through Turkish airspace are subject to the same rules as aircraft and other flying objects. The United Nations treaties and principles relating to various aspects of the issue must also be considered.

Ukraine

[Original: Russian]

To date, no specific national legal norms have been established in Ukraine with respect to the passage of aerospace objects during take-off and/or re-entry into the Earth's atmosphere. Ukraine believes that the relevant international legal norms are those set out in the United Nations treaties on outer space.

Question 9. Are the rules concerning the registration of objects launched into outer space applicable to aerospace objects?

Finland²

[Original: English]

The rules concerning the registration of objects launched into outer space cannot be applied as such to aerospace vehicles. In air law, registration determines the nationality of the craft and is vital for all subsequent claims, civil, commercial and criminal. In space law, it is the registration that determines the exercise of jurisdiction and control and liability. This significance of registration must be maintained even in the case of application to aerospace vehicles.

Portugal

[Original: Spanish]

There is an instrument that specifically governs the registration of objects launched into outer space, namely the 1975 Convention on Registration of Objects Launched into Outer Space (General Assembly resolution 3235 (XXIX), annex). This Convention should be reviewed and amended in order to extend the scope of application of existing or similar rules to aerospace objects. In the interests of security and public information (in accordance with the principle of safety and

credibility), a comprehensive register of all aerospace objects and objects launched into outer space should be maintained in collaboration with the United Nations.

Rwanda

[Original: French]

Yes.

Turkey

[Original: English]

An aerospace object capable of serving both purposes (aeronautics and astronautics) should be registered both as an aircraft and a spacecraft, unless a single regime is developed and provides for a different procedure. Such a regime would need to include appropriate provisions on the establishment of special national registries and possibly also a special international register for such aerospace objects.

Ukraine

[Original: Russian]

The rules concerning the registration of objects launched into outer space are applicable to aerospace objects only in cases where the purpose of the mission of those objects is the exploration and use of outer space. However, a number of additions must be made to the norms of space law.

Question 10. What are the differences between the legal regimes of airspace and outer space?

Portugal

[Original: Spanish]

The two legal regimes differ with respect to their rules, but first and foremost with respect to their guiding principles. Air law is based on the principle of the exclusive sovereignty of States over their territories, whereas space law is based on the principles of freedom of use of outer space, non-appropriation by States and the peaceful uses of outer space for the benefit of mankind. These are the fundamental principles set out in the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and they should continue to regulate space activities by States and private entities. In that regard it should be stressed that international cooperation is the cornerstone of the principle of applicability of international law.

Rwanda

[Original: French]

Each State has sovereignty over the airspace above its territories and territorial waters, whereas outer space is not subject to appropriation and is free for exploration and use by all States.

Turkey

[Original: English]

The fundamental difference between the two legal regimes is based on the principles of each regime. Air law is based on the principle that each State has complete and exclusive sovereignty over the airspace above its territories and territorial waters, whereas space law is based on the principle that outer space, including the Moon and other celestial bodies, is free for exploration and use for peaceful purposes and is not subject to national appropriation by claim of sovereignty, by means of use or occupation or by any other means.

Ukraine

[Original: Russian]

1. While each State enjoys complete and exclusive sovereignty over the airspace above its territory and territorial waters, outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation or by any other means.
2. Activities conducted in airspace are subject to the norms of national and international air law, whereas those conducted in outer space are regulated by the norms of international space law.
3. The flight of an aerospace object from Earth into orbit is subject to the norms set out in the 1972 Convention on International Liability for Damage Caused by Space Objects, whereas Earth-to-Earth missions performed by aerospace objects are subject to the norms established in the 1929 Convention for the Unification of Certain Rules Relating to International Carriage by Air, the 1952 Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface and other instruments.
4. There are substantial differences between the two regimes in terms of the regulations governing procedures for the registration of aerospace objects: the registration of aircraft is provided for by the 1944 Convention on International Civil Aviation whereas the registration of space objects is governed by the 1975 Convention on Registration of Objects Launched into Outer Space. These agreements establish different procedures and requirements for registration.

General responses

Lebanon

[Original: English]

Lebanon at present has no activities related to the legal issues concerning aerospace objects.

Annex

Explanatory memorandum to Finland's reply: study of the questionnaire on possible legal issues with regard to aerospace objects*

[Original: English]

Introduction

1. The questionnaire on possible legal issues with regard to aerospace objects is the last thread in the debates on the delimitation of outer space that have been going on in the Committee on the Peaceful Uses of Outer Space and its subcommittees for the past 45 years. With the 1976 Bogotá Declaration by which certain equatorial countries made a claim over the geostationary orbit, the delimitation issue took on a new dimension. At the thirty-second session of the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space, there was debate on the definition and delimitation of outer space; the character and utilization of the geostationary orbit; and ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union (see A/AC.105/544, annex IV, sect. A). At the thirty-fourth session, matters relating to the delimitation of outer space and to the character of the geostationary orbit came under agenda item 4. During its thirty-eighth session, the Subcommittee finalized the text of the questionnaire. The purpose of the questionnaire, as stated, was to seek the primary views of States members of the Committee on various legal issues relating to aerospace objects. Later on, slight modifications and changes were made to the structure of the questionnaire, but it remains more or less the same.

2. It appears (see A/AC.105/635/Add.5) that the questionnaire stems from the Working Group of the Subcommittee on agenda item 4 on matters relating to the definition and delimitation of outer space and to the character and utilization of the geostationary orbit. Even United Nations documents (for example, A/AC.105/C.2/L.204, a comprehensive analysis of the replies to an earlier version of the questionnaire on possible legal issues with regard to aerospace objects) were issued with the title "Matters relating to the definition and delimitation of outer space and to the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union".

3. Since the questionnaire seeks to define the term "aerospace object" and thereby to achieve the goals of agenda item 4 of the Working Group of the Subcommittee (i.e. delimitation of outer space and utilization of the geostationary

* The present study was conducted by the Institute of Air and Space Law, Faculty of Law, University of Lapland (Finland) and should be regarded as the explanatory memorandum to the response of Finland to the questionnaire.

orbit), the Institute of Air and Space Law of the University of Lapland has attempted to provide its opinion with a focus on those objectives.

4. Also, as regards questions of delimitation, the Institute's approach has been progressive and, based on its studies and research, has considered airspace as extending up to 80-100 kilometres (km) (these points are highlighted in the answers to the questionnaire).

5. The issues are dealt with in the same order as in the questionnaire. The findings of the Institute and its viewpoints are provided in detail. At the end of every issue, the probable way of answering the particular question is also given. The answers reflect the general policy and approach of the Institute.

Question 1. Can an aerospace object be defined as an object which is capable both of travelling through outer space and of using its aerodynamic properties to remain in airspace for a certain period of time?

6. As a first step, what is required is to define the scope of the expression "aerospace objects".

A. Scientific definitions

7. General science speaks of "aerospace" as the "atmosphere and outer space considered as a whole".

8. It could also fall within the following three definitions:

(a) "A blend of space science and technology and those pertaining to the Earth's atmosphere";

(b) "An integration of astronautics (science and technology of space flight) into aeronautics (theory and practice of aircraft navigation)";

(c) "Aircraft and spacecraft, including the design, manufacture and flight of vehicles or missiles that fly in and beyond the Earth's atmosphere".

9. It must be inferred that the term "aerospace" is not limited to air/spacecraft. "Aerospace" may include other matters that apply jointly to atmosphere and outer space. So when "aerospace" is coined as "aerospace objects", its application is not limited merely to air/space vehicles. Had the objective been only to determine the liability and jurisdiction of air/space vehicles, then "aerospace vehicles" could have been treated as synonymous with "aerospace objects". For the present context, however, the objective behind defining "aerospace objects" is to determine not merely liability and jurisdiction concerning space/aero vehicles but also the utilization of the geostationary orbit and the delimitation of outer space. So, for the present case, "aerospace objects" would mean any object that has a joint association with air and space and not necessarily aerospace craft.

10. If one takes the approach of general science, it could be construed that "aerospace objects" may include aerospace vehicles, aerospace signals, natural cosmic particles that enter the Earth's atmosphere, a defunct aerospace vehicle,

robots, products resulting from the joint application of space technology and Earth science (aerospace products) and even aerospace infrastructure.

B. Legal definitions

11. No legal instrument proffers a definition for “aerospace objects”, although there are certain that come close to it. Hence, for further construal, definitions are sought by distinguishing between “space objects” and “aero/aerial/air objects”.

Space objects

12. The 1972 Convention on International Liability for Damage Caused by Space Objects (General Assembly resolution 2777 (XXVI), annex) defines “space objects” in article 1, subparagraph (d) thus: “The term ‘space object’ includes *component parts of a space object* as well as its *launch vehicle* and *parts thereof*.” [Emphasis added.]

13. Instead of defining “space objects”, the Liability Convention emphasizes that even the component parts as well as the launch vehicle of a space object would also be a space object. Though it leaves “space object” undefined, it illuminates the fact that the “launch vehicle” is also a “space object” and not synonymous with it. This means that the expression “space object” has a wider connotation. Since the component parts of a space object are also “space objects”, it may embrace the satellite, its accessories, payload, signals and so on. The launch vehicle that carries it is one among the “space objects”. Thus, from the language of the Liability Convention, it appears that “space objects” are broader than “space vehicles”.

14. If this definition is applied to space shuttles, as they are the only aerospace vehicles now in operation and a prototype delineation of such vehicles, it fully conforms to the requirements of the definition. This would bring the launch vehicle of the shuttles, the shuttle itself (as a space object and not as a vehicle), its accessories, the products made in the shuttle’s laboratory and even men inside it into the domain of “space objects”. However, if the definition is applied to a craft that could take off and land horizontally, then the second part of the definition regarding the launch vehicle becomes obsolete. So if that part is removed from the definition, then “space object” would mean only the component parts of a “space object”. This makes it abundantly clear that, under space law, “space objects” are not limited to “space vehicles”.

15. The 1975 Convention on Registration of Objects Launched into Outer Space (General Assembly resolution 3235 (XXIX), annex), in defining “space objects”, goes beyond a verbatim reproduction of the definition in the Liability Convention.

16. The 1998 Space Activities Act (Australia) defines “space object” as including:

- (a) A launch vehicle; and
 - (b) A payload (if any) that the launch vehicle is to carry into or back from outer space; or any part of such a thing, even if:
 - (c) The part is to go only some of the way towards or back from outer space;
- or
- (d) The part results from the separation of a payload or payloads from a launch vehicle after launch.

The Space Activities Act further defines a space vehicle as a vehicle that can carry a payload into or back from outer space.

17. The 1986 Outer Space Act (Great Britain and Northern Ireland) defines “space objects” as including “component parts of a space object as well as launch vehicle and parts thereof”.

18. The 1964 Convention for the Establishment of a European Organisation for the Development and Construction of Space Vehicle Launchers defines a space vehicle as “a vehicle designed to be placed in orbit as a satellite of the Earth or of another heavenly body or to be caused to traverse some other path in space”.

19. In all the aforesaid definitions, one common factor is that a space vehicle is supposed to be a launcher that could carry “space objects” and it also qualifies as a space object itself.

Aero/aerial/air objects

20. Annex 7 to the 1944 Convention on International Civil Aviation (the “Chicago Convention”) defines an aircraft as “any machine that can derive support in the atmosphere from the reaction of the air”.

21. The 1958 Federal Aviation Act (United States of America) defines the term “aircraft” as “a device that is used or intended to be used for flight in the air”. The Act further defines an airplane as “an engine-driven fixed-wing aircraft heavier than air, that is supported in flight by the dynamic reaction of the air against its wings”. It also provides definitions of “instrument”, “airframe” and so on. From the approach of this Act, it is apparent that “aircraft” here means an air/aerial/aero object.

22. The 2001 Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Aircraft Equipment defines “aircraft” in the same manner as the Chicago Convention and also includes airframes with aircraft engines and helicopters. Though the Protocol does not define “air object”, it includes a definition of “aircraft object” as including airframes, aircraft engines and helicopters. So it must be inferred that air/aerial/aero objects fall outside the purview of “aircraft”.

23. A perusal of these definitions also tends to indicate that an “aerocraft” or “aircraft” is an air/aero/aerial object.

C. Conclusions

24. The first question of the questionnaire, concerning the definition of “aerospace objects”, is a closed one, as the respondents are asked to say whether an aerospace object is one that: (a) is capable of travelling through outer space; and (b) uses its aerodynamic properties to remain in airspace. Respondents are not required to define “aerospace objects”, instead they are asked to either acquiesce to or disagree with the two features of an “aerospace object”.

25. Keeping the main objectives of the questionnaire in view and having reviewed the documents, related definitions and the legal implications thereof, the Institute is of the view that an “aerospace object” cannot be defined in the manner provided in the questionnaire, since the expression “aerospace object” has wider connotations

and may have serious ramifications in application (discussed in the answers to other questions).

26. If the expression “aerospace object” is replaced with “aerospace vehicle” or “aerospace craft”, then the two features specified in the questionnaire could be satisfied and the definition would be acceptable. At the same time, as pointed out by many member States in their responses, the expression “to remain in airspace for a certain period of time” must also be clarified. The Institute is of the view that it could be replaced with “to travel through airspace”.

Question 2. Does the regime applicable to the flight of aerospace objects differ according to whether it is located in airspace or outer space?

27. If the answer to the question is negative, this automatically discharges the respondent from the need for any further clarification, but it would be an undiscerning approach to the whole issue at hand and is likely to foil the efforts and objectives of the Legal Subcommittee. If the answer is in the affirmative, however, this requires the respondent to tender further amplification, as the applicability of a different regime would come into effect only when both domains are clearly demarcated. Also the legal impact that the “aerospace vehicles” are going to have on these regimes needs elucidation, as “aerospace vehicles” are defined neither technically nor legally.

28. Before going further, the Institute reiterates its stand that the expression “aerospace objects” must be replaced with “aerospace vehicles” or “aerospace craft”.

29. The question also does not clarify whether the “regime”, as mentioned, is a “legal regime”. Some of the replies provided by member States emphasize the technical nature of the regime and this adds ambiguity to the issue. For all intents and purposes, however, the Institute treats it as a “legal regime”.

30. Since it has been decided to approach the answer progressively by proposing separate regimes for an “aerospace vehicle” while in airspace and in outer space, the question of delimitation arises. Though a good number of theories^a exist in connection with the delimitation issue, the Institute relies on just two among them. One is the theory of “effective orbiting” and the other that of “arbitrary distances”. The distance of 80-100 km is fixed on this basis. Though the Institute respects the functional approach, its views, unlike others, are not based solely on the “functional theory”. If focused through any perspectives, this view would find solid justification.^b

31. On the basis of this delimitation of air/outer space, for an “aerospace vehicle”, air law with certain adaptation as suggested in question 3 would be the applicable law, as long as the vehicle is in airspace. Once the threshold is crossed, space law, with adaptation, could be invoked. But this cannot be ruled out with minimalism, as

^a Some of the major theories in this connection are the functional approach theory, the aerodynamic lift theory, the *usque ad infinitum* theory, the effective orbiting theory and the arbitrary distances theory.

^b For further details, please consult the Institute.

air and space jurisprudence has its own character, objectives and philosophical roots. There also remain questions such as registration, carriage, accidents and liability, standardization and so on (details are provided under question 3).

32. The opinion expressed in relation to the first issue regarding replacing the expression “to remain in airspace for a certain period of time” also applies to this question. Here the expression “located in air/outer space” must be replaced with “travelling through”.

33. The mode of applying the diverse regimes is dealt with in the third question.

Question 3. Are there special procedures for aerospace objects, considering the diversity of their functional characteristics, the aerodynamic properties and space technologies used, and their design features, or should a single or unified regime be developed for such objects?

34. The question is in a way an extension of the earlier one. It has two parts:

- (a) Are there special procedures for aerospace vehicles?
- (b) Should a uniform regime be developed for such vehicles?

35. The first part can be answered easily, since there are no existing special procedures for aerospace vehicles either in air law or space law.

36. As regards the second part, since there are no special procedures, there is a need to develop a unified regime. But the decisive question is on what lines the new regime must be developed: What should be its characteristics? On what principles must it be based?

37. The Institute has derived three alternatives:

- (a) A totally new regime;
- (b) Air law or space law;
- (c) An adapted regime.

These possibilities for a new regime are studied below.

(a) A totally new regime

38. If a totally new regime is to be developed, primary consideration must go to the characteristics mentioned in the question itself, that is, a regime based on the functional characteristics, aerodynamic properties, space technologies used and design features. Certainly, these technical features deserve consideration, but the more decisive issue would be reconciliation of the new legal regime with the existing norms of air and space law. Problems would be centred mainly on doctrines, like national sovereignty over airspace, common heritage of mankind and so on. A totally new regime that discarded the existing norms of air and space law would create havoc. This option is thus the least advisable.

(b) *Air law or space law*

39. This means designating either air law or space law to govern the activities of aerospace vehicles. If air law is adopted, the problems would start with the definition itself, as aerospace vehicles, owing to their characteristics, cannot fall within the ambit of an “aircraft” as meant by the Chicago Convention or its related conventions. Choosing space law would also run into similar problems. Then would emerge the clash between “air sovereignty” and “freedom” and parallel to that another one between the Warsaw System (derived from the 1929 Convention for the Unification of Certain Rules Relating to International Carriage by Air) and the “space liability and registration regime”. The issue would have been easier to settle, had the first question on the definition of aerospace vehicle been of a legal nature rather than seeking to define it through its ability to fly through outer space and the use of aerodynamic properties to travel through air. Above all, there would be severe a jurisprudential clash, as air law, since its genesis, in its outlook is more or less a transportation law, whereas the spirit of space law lies in ensuring the freedom of States in outer space counterbalanced by the demand of the common interest of mankind as a whole. The entire normativity of space law is imbued with this spirit.

40. In a state of affairs where space law with its entire norms governs “aerospace vehicles”, an aerospace craft flying over a national territory would be carrying a chain of legal issues just as when such a craft governed by air law flew through outer space. This “air law or space law approach” would still leave questions relating to standardization, bilateralism, proprietary claims and so on. Thus it does not appear to be apposite for the given situation.

(c) *An adapted regime*

41. This option has viability only if a clear demarcation between airspace and outer space can be made. The approach is, as suggested by many member States, “functional” or “purpose-based”. Owing to the absence of the concept of aerospace vehicles in legal texts, however, some slight adaptation would be required. In other words, both air law and space law need to accommodate, by way of slight insertions and alterations, “aerospace vehicles” within their scope, while at the same time upholding the values of both air and space law. The International Civil Aviation Organization and the Committee on the Peaceful Uses of Outer Space, with their expertise in the fields concerned, could negotiate with each other and play a decisive role here.

42. In this approach, the destination determines the regime. So an aerospace vehicle meant to transport passengers and cargo to another point on Earth through outer space would be governed by the “adapted air law” and an aerospace vehicle meant for outer space exploration would be subject to the “adapted space law”.

43. An aerospace vehicle, intended for civil aviation, would be under the governance of the Chicago Convention for all flight-related purposes (with the five freedoms), under the Warsaw System for all carriage- and liability-related issues and the 1963 Convention on Offences and Certain Other Acts Committed on Board Aircraft for all penal issues. All these apply only when the aerospace vehicle is below the stipulated altitude, however. When the craft is in outer space, that is, above the stipulated altitude, due regard must be given to the liability regime in

outer space. Issues such as registration, standardization and navigation would be regulated by existing aviation rules.

44. In the same manner, an aerospace vehicle meant for space exploration (other than transportation) shall be governed by space law. Registration, standardization, ground control and so on would be subject to the space legal system. When such a space vehicle flies through the airspace of a sovereign State, the spacecraft could exercise the freedom of over flight.

Question 4. Are aerospace objects while in airspace considered as aircraft, and while in outer space as spacecraft, with all the legal consequences that follow therefrom, or does either air law or space law prevail during the flight of an aerospace craft, depending on the destination of such a flight?

45. This question is a more specific version of the second question. There it was asked whether the regime applicable to an aerospace vehicle differed according to whether it was located in airspace or outer space. Here the question is more specific, whether air law could be applied by considering it an aircraft when in airspace and space law could be applied by considering it a spacecraft when in outer space. The question also gives another option, namely, to choose between air law and space law. That choice is to be made on the basis of the aerospace vehicle's destination.

46. The issues involved were discussed in detail under the two preceding questions. On that basis, it could be construed that an aerospace vehicle is neither an aircraft nor a spacecraft. It is but an "aerospace craft". When it is in airspace, the full air law cannot be applied as such and when it is in outer space, the full space law cannot be applied either. The second option sounds more relevant and, in that perspective, destination would have to determine the applicable law. Although the Institute agrees with this approach, it is not fully in favour of a choice between air law or space law in their present form. Certainly, the choice must be made on the basis of the destination and the applicable law would be either space law or air law, but this must be with proper adaptations, as suggested in the third question.

Question 5. Are the take-off and landing phases specially distinguished in the regime for an aerospace object as involving a different degree of regulation from entry into airspace from outer space orbit and subsequent return to that orbit?

47. Considering the issues discussed above, this question is immaterial.

Question 6. Are the norms of national and international air law applicable to an aerospace object of one State while it is in the airspace of another State?

48. This question highlights the jurisprudential differences between air law and space law. Whereas space law aims at ensuring the "freedom" of States in outer space counterbalanced by the demands of the common interest of mankind as a

whole, air law, quite often referred to as “aviation law”, is a transportation law. The thread that runs through the entire body of space law is the inclusive access to and interdependent interests of all participants in space activities. Air law mainly attempts to ensure the best operation of aviation technology, which at times assumes the form of a consumer law. The roles law is required to perform in both the spheres are entirely different. There even exist slight differences with regard to the subjects that are the bearers of rights and obligations. The normativity in these branches of law has been greatly influenced by its objectives and the rights conferred. Moreover, air law is a private law with the characteristics of public law, whereas space law is a purely public law. In recent years, however, owing to the shift in the nature of space activities, space law has started reacting to private activities in this sector, but space activities are state-controlled and state-governed.

49. The principles that would be pertinent in the present context are:

(a) *Air law*: national sovereignty over airspace, individual and organizational liability, penal principles and rational use of airspace;

(b) *Space law*: freedom in outer space activities, state responsibility for space activities, peaceful uses of outer space, cooperation and mutual assistance.

50. An aerospace vehicle travelling through airspace and then outer space shall have due regard for the fundamental principles of both branches of law. Since the idea of an adaptive regime is being mooted, neglect of the fundamental doctrines is not feasible. Such a regime would confer certain rights and obligations on an aerospace vehicle, which must be exercised in good faith with due regard for the corresponding interests of other participants.

Question 7. Are there precedents with respect to the passage of aerospace objects during take-off and/or re-entry into the Earth’s atmosphere and does international customary law exist with respect to such passage?

51. For the first part of the question, concerning precedents, the Institute’s reply provided below is self-explanatory.

52. As regards the existence of international customary law with respect to the passage of an “aerospace vehicle”, the answer is negative. In the context of “space objects”, however, certain provisions of space treaties have crystallized into international customary law.

53. The most important in this connection is the duty to rescue, assist, and return, as codified in the 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (General Assembly resolution 2345 (XXII), annex). Through generality, uniformity and consistency of practice this has attained the status of customary international law. This duty extends to assisting in all search and rescue operations and the safe return of astronauts and the “space object” to the launching authority. Also, while exercising this obligation, States shall also be bound by the principle of mutual assistance and cooperation in the peaceful exploration and use of outer space. The general principle of good neighbourliness may also find application here.

54. The principle of absolute liability for the damage caused by a “space object” on the surface of the Earth also applies to a “space object”.

Question 8. Are there any national and/or international legal norms with respect to the passage of aerospace objects during take-off and/or re-entry into the Earth’s atmosphere?

55. This question concerns the applicability of national and international legal norms with respect to “space objects”. Hence the answer provided to the second part of the previous question applies here.

Question 9. Are the rules concerning the registration of objects launched into outer space applicable to aerospace objects?

56. At present, the law relating to the registration of objects launched into outer space is governed by the 1975 Registration Convention. The entire registration process is based on the notion of the “launching State”. In other words, the Convention requires the launching State to register the object that it has launched into outer space. Moreover, the applicability of the Convention is limited to “space objects”. Certainly, the Registration Convention cannot be applied as such to the registration of “aerospace vehicles”.

57. Registration of aircraft is governed at present by the Chicago Convention, which also cannot be applied as such to “aerospace vehicles”.

58. Another international instrument that deals with the registration of space objects is the 2001 preliminary draft protocol on matters specific to space assets to the Convention on International Interests in Mobile Equipment. This Protocol refers to a Supervisory Authority for maintaining a registry of interests in space assets. “Space assets”, as defined in the Convention,^c assume significance for aerospace vehicles when the aforesaid adaptation takes place. Similar registration provisions, but for aircraft, are also present in the Protocol to the Convention on International Interests in Mobile Equipment of 2001 on Matters Specific to Aircraft Equipment.

^c “Any indefinable asset that is intended to be launched and placed in space or that is in space;
“Any identifiable asset assembled or manufactured in space;
“Any identifiable launch vehicle that is expendable or can be reused to transport persons or goods to and from space; and
“Any separately identifiable component forming a part of an asset referred to in the preceding subparagraphs or attached to or contained within such assets.”