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**Committee on the Peaceful
Uses of Outer Space****Legal Subcommittee****Fifty-fifth session**

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Item 14 of the provisional agenda*

**General exchange of views on the
application of international law to small
satellite activities****The European Space Agency and small satellite activities****1. Introductory remarks on the European Space Agency**

The European Space Agency (ESA) is an international intergovernmental organization with legal personality, established by the Convention on the Establishment of a European Space Agency signed in 1975 and entered into force in 1980. As of 2016, ESA has 22 Member States, a number of cooperating States under diverse legal frameworks and international cooperation partners in Europe and beyond. ESA carries out activities in domains ranging from research and technology development to launch vehicles, space applications, solar system exploration, astronomy, fundamental physics and human spaceflight. ESA is a permanent observer to the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and was the first international intergovernmental organization to declare acceptance of the rights and obligations provided for in the Rescue Agreement, the Liability Convention and the Registration Convention.

2. The notion of ‘small satellites’ and ‘small satellite activities’

ESA notices that there is no established definition of the term “small satellite” in international law, although there are viable ways of classifying and distinguishing artificial satellites by determining factors such as mass, size, shape, cost, orbital lifetime or others. Originating as experimental devices or technology test-beds, small satellites are taking on a growing number of roles alongside larger satellites. Technological developments such as miniaturisation and micro-electrical-mechanical systems (MEMS) have improved their capabilities, broadened their range of uses

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and enhanced their maturity to a point where they are employed in operational applications as well as scientific missions. It can be observed that the notion of “small satellite activities” does not only refer to the spacecraft but is at times extended to its operational environment. An increasing number of new, often non-governmental actors are developing and operating small satellites to such an extent that the notion of “small satellite markets” emerged. While there are approaches today to allow for a common understanding of small satellite activities, the term “small” ultimately unites a heterogeneous group of space objects.

3. ESA and small satellite activities

Considerations with regard to small satellite activities within the context of ESA can be traced back as far as the 1980s when the Agency, mindful of the need to increase the frequency of mission opportunities, sought means of introducing smaller missions into its mandatory and optional programmes. However, the notion of “small” developed under these early strategic considerations should be distinguished from the modern, widespread notion of “small satellites”.

ESA’s involvement in small satellite activities may be characterised along two main lines: (a) small ESA satellite activities, and (b) small satellite activities in ESA Member States with a relation to the Agency. Small satellites have been and are being developed as part of ESA programmes, for example for the purposes of technology development and demonstration, research and applications. In parallel, small satellites are increasingly being deployed by actors, non-governmental in particular, in ESA Member States to carry out a variety of missions. This includes small satellite activities by universities and other educational establishments. Some of these small satellites have been released from the International Space Station. ESA takes on diverse roles with regard to such activities: technical support ranging from advisory services to testing and verification, facilitation of launch and operation or activities related to spacecraft end of life and space debris mitigation.

In addition, ESA contributes to small satellite activities through research and development, the Agency’s involvement in standardisation and coordination as well as outreach and education. An example is ESA’s *Fly Your Satellite!* initiative which, since its inception in 2013, has allowed student teams of ESA Member States to participate in the conception, development and integration of a small satellite project ahead of testing and, eventually, launching into orbit.

ESA recognizes the benefits that small satellites may bring to developers, operators and users, while being conscious that satellites, regardless of their mass, size or programmatic label, are objects which need to satisfy a range of requirements in order not to run counter to the sustainable use of outer space.

4. Considerations regarding the application of international law to small satellites

While small satellites may be distinguished based on their technical characteristics, the United Nations space treaties do not characterise the term “space object” by technical or geometrical properties. Consequently, for the purpose of implementing its activities and safeguarding an adequate response to its obligations under international space law, it is ESA’s practice to consider small satellites, independently of their technical characteristics or programmatic characterisation, as

“space objects” as per the definition provided for in Article 1 lit. d Liability Convention.

ESA space objects are registered in the ESA Space Object Register and notified to the United Nations Secretary-General in observance of the Registration Convention and ESA’s Space Object Registration Policy. Moreover, a variety of norms are applicable to ESA missions beyond the question of whether or not they are to be regarded as small satellite activities. This includes ESA’s Space Debris Mitigation Policy for Agency Projects, ESA’s Space Debris Mitigation Compliance Verification Guidelines as well as standards such as those developed through the European Cooperation for Space Standardization (ECSS) mechanism. Where small satellite activities are carried out under the jurisdiction and control of one of ESA’s Member States with technical assistance of the Agency, ESA is attentive to appropriately coordinate with the respective governmental authorities.

At the same time, certain technical, operational or programmatic characteristics of small satellites and small satellite missions may differ from larger-scale satellite missions, and this may entail the need for apposite regulatory approaches. It can be observed that some national space laws provide for rights or obligations specific to certain types of space activities, to certain types of space objects or to certain objectives and purposes. For example, some States provide for distinct authorisation, licensing or insurance requirements when it comes to certain space activities. Members of what is at times referred to as the “small satellite community” (i.e. developers, service providers, operators and users) have underlined specific regulatory needs with regard to small satellites. Such needs could arise from technical characteristics as well as from operational or managerial specificities of small satellite activities.

Considerations regarding the applicability and application of international law to small satellite activities should strive to take into account the balance of interests inherent to space law. It may also be helpful to distinguish between established principles of general international space law on the one hand and specialized norms, administrative procedures and technical guidelines on the other hand. While the first category represents the international legal foundation for the exploration and use of outer space, including small satellite activities, the second category has historically given rise to the development of norms specific to certain types of space activities. This can be illustrated through examples such as the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space or the Safety Framework for Nuclear Power Source Application in Outer Space. In this regard, it may prove helpful to distinguish three spheres when considering small satellite activities: (i) the applicability of existing legal norms to small satellite activities; (ii) the application of international law to small satellite activities as reflecting past and current practice; and (iii) the discussion of future developments.

Within its mandate and competences, ESA continues to foster the understanding and application of space law by offering advice as to the legal framework which underpins small satellite activities. It provides for related education and information of new actors, such as student teams developing a small satellite, and helps to establish the necessary contacts between them and the relevant governmental authorities of ESA Member States for the purposes of authorisation and continuous supervision. Technical and non-technical departments in ESA coordinate their efforts to provide guidance aimed at actors in ESA Member States and beyond who

operate or consider operating a small satellite. In this regard, ESA commends the United Nations Office for Outer Space Affairs and the International Telecommunication Union for the “Guidance on Space Object Registration and Frequency Management for Small and Very Small Satellites” (A/AC.105/C.2/2015/CRP.17).

5. Conclusion

Activities related to small satellites are becoming increasingly common both within ESA Member States and within ESA itself. The Agency is actively involved in technical and legal aspects of such activities and cooperates with its Member States to ensure that they are carried out safely, in a beneficial manner and in compliance with the obligations rooted in international law.
