

# **1. Answers to the questionnaire on the application of international law to small-satellite activities**

## **Reply by the International Society for Photogrammetry and Remote Sensing**

### **1. Overview of small-satellite activities**

*1.1 Are small-satellites serving the needs of your society? Has your country determined whether small satellites could serve an identified technological or development need?*

Often, small-satellites provide vital contribution to scientific projects and/or research related initiatives. If this is the case, small-satellites contribute to meet the needs of societies. Interestingly, certain countries (i.e. Austria) have taken the following approach: if a satellite pursues activities in the public interest, not only the amount of the mandatory third-party liability insurance to be purchased in order to get a license might be lowered but also, in some circumstances, be entirely waived.

*1.2 Is your country involved in small-satellite activities such as designing, manufacturing, launching and operating? If so, please list projects, as appropriate. If not, are there future plans to do so?*

The answer varies on a case-by-case basis. Certain countries may not take direct part in the manufacturing and operation of small-satellites and merely perform launching services, while other may be involved in all phases of a small satellite activity, from manufacturing to operation.

*1.3 Which kind of entity in your country is carrying out small-satellite activities?*

The situation changes depending on the country considered. Generally speaking, in the early days of utilization of small satellites, universities, research centers, non-profit organizations, were mostly involved in carrying out small-satellites activities. Nowadays, the number and kind of entities involved in the use of small-satellites have vastly broadened, as a consequence of the fact that these satellites are used to provide commercially oriented services (i.e. broadband internet services).

*1.4 Is there a focal point in your country responsible for coordinating small-satellite activities as part of your national space activities?*

The entity responsible may change from country to country. In principle, the licensing authority of space activities may play the role of coordinator of small-satellite activities.

*1.5 Are small-satellite activities carried out in the framework of international cooperation agreements? If so, what type of provisions specific to small-satellite activities are included in such cooperation agreements?*

Often, small-satellite operators based in different countries join forces to collaborate in international projects. In this case, the legal framework governing their activities will be provided by an international cooperation agreement. While the specific elements of each agreement change on a case-by-case basis, each agreement will make sure that the activities are consistent with fundamental space law principles and the terms of the UN space treaties as applicable and do not undermine national security interests and international relations.

## **2. Licensing and authorization**

*2. Do you have a legal or regulatory framework to supervise any aspect of small-satellite activities in your country? If so, are they general acts or specific rules?*

The launch of small satellites must be authorized under the licensing procedure set forth in domestic space law; indeed, despite their small size, small satellites fall within the definition of ‘space object’, hence their activities need to be properly authorized and controlled to ensure their consistency with international law. Certainly, due to their specific characteristics, the licensing procedure can be accommodated or rendered more flexible. For example, certain countries have lowered the amount of the third-party liability insurance that an applicant must purchase in order to be authorized to launch an object in space, when such an object is a small satellite (Austria and others). Other countries, like Belgium, have included provisions dealing with ‘passive’ satellites, namely satellites that lack autonomous form of propulsion or any means to control them, particularly clauses dealing with the liability of the owner of the small satellite. Other countries, particularly those dealing with large constellations of satellites, require such satellites to possess a minimum level of maneuverability.

## **3. Responsibility and liability**

*3.1 Are there new challenges for responsibility and liability in view of small-satellite activities?*

A State that authorizes the launch of small satellites will be internationally responsible and likely liable for their activities. Challenges exist in relation to the characteristics of small-satellites and their number. As to the former, the largest majority of small satellites are not maneuverable, meaning that their operators cannot perform any maneuver to avoid collision. Regardless of such lack of maneuverability, the launching State of a small satellite that cause damage, even when the satellite is operated by a private entity, will be internationally liable for such damage. Some States have taken steps to address these problems by either

requiring the small satellite to have communication links on board or to possess a minimum level of operation capability. As to the latter point, when small satellites are part of a large constellation, there are several regulatory challenges, for example those related to the effective control of the licensed activities, the mitigation of their detrimental impact on the environment, the registration of the satellites and insurance requirements, just to name a few.

*3.2 How are liability and insurance requirements enforced on an operator in your country, for a small satellite under your country's responsibility, in the event that "damage" occurs on the surface of Earth, to aircraft in flight or to another space object in orbit?*

On a general basis, national space laws require small satellites' owners to purchase a third-party liability insurance as a pre-requisite to obtain a license to launch their object/s, in a manner similar to the one that applies to the owners and operators of 'traditional' larger satellites. Nevertheless, the amount of such an insurance might be lowered when compared to the one required to launch traditional satellites.

Questions remain in connection with the licensing of large groups of small satellites, such as in the case of mega-constellations, in particular whether the insurance requirement would address the constellation as a whole or each individual satellite that composes it.

#### **4. Launching State and liability**

*4.1 Since small satellites are not always deployed into orbit with dedicated rockets as in the case of larger satellites, there is a need for clarification in the understanding of the definition of "launch". When a launch of a small satellite requires two steps – first, launching from a site to an orbit and, second, deploying the small satellite to another orbit – in your view, would the first step be regarded as the "launch" within the meaning of the United Nations treaties on outer space?*

In the example given, the 'first step' could be considered as a 'launch' because through it small satellites are launched in outer space, even though at that stage without reaching their final destination and also because without the 'first step' the 'second step' could not take place. However, it would be advisable for the domestic licensing authority of a small-satellite operation to take these problems into account and shape the license and its requirements.

In the scenario that is given in the question, an additional question to be considered would be the moment from which the rights and obligations of the owners/operators of small satellites would become relevant, as until the satellites reach their intended orbital locations there is practically very little that they can effectively do in terms of guiding and communicating with their satellites.

*4.2 Do you think that the current international regulatory regime is sufficient to regulate operators of small satellites or that there should be a new or different international regulatory approach to address operations of small satellites?*

The existing regulatory regime provides the basic principles applicable to all space objects, including, thus, also small satellites. Certainly, however, such a regime was not designed to take into account the specific characteristics of small satellites. In order to fill up the gaps that the existing international regulatory regime presents in relation to the regulation of small-satellite activities, States have adapted their domestic space licensing procedures to properly address the regulatory challenges and the issues that the launch and operation of small satellites present. Considering the different approaches that States have taken at domestic level, it might certainly be beneficial to have a new, and more specific, international regulatory approach to deal with the operations of small satellites, even though one has to recognize the challenges associated with elaborating and agreeing upon such an approach.

## **5. Registration**

*5. Does your country have a practice of registering small satellites? If so, does your country have a practice of updating the status of small satellites? Is there any legislation or regulation in your country that requires non-governmental entities to submit to the Government information for the purpose of registration, including updating of the status of small satellites they operate?*

Each country may take a different approach to this problem; practice, however, shows that small satellites are not an exception in the context of the implementation of the obligation to register objects launched in outer space. This means that when small-satellite operators apply for a license to launch their satellites, they must indicate the expected date and location of the launch and, after the launch has been performed, communicate the relevant information to the licensing authority for insertion of these data in the national registry of space objects.

## **6. Space debris mitigation in the context of small-satellite activities**

*6. How has your country incorporated specific requirements or guidelines into its national regulatory framework to take into account space debris mitigation?*

*Answer.* Small-satellites operators have to comply with space debris mitigation requirements as part of their space licensing process, even though practical challenges exist when such satellites do not possess any capability to maneuver. For this reason, the licensing authorities of the countries (i.e. the United States) that are dealing with the operation of mega-constellations of satellites require the operators of such constellations to provide their small-satellites with some minimum capability to maneuver and correct their orbit.