CHAPTER 10

QB 50: Legal Aspects of a Multinational Small Satellite Initiative

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Exploiting Moore’s Law and the enormous commercial investments in microelectronics, we can now build highly capable, low-cost, rapid-response and reliable operational small satellites technologies, [...] changing the economics of space...

Professor Sir Martin Sweeting, Surrey Satellite Technology Ltd, 2012

1 Introduction

The multiplication of small satellite missions is a direct result of the ‘democratisation’ of outer space. Several factors explain this trend: first, the continuous investment of states in the privatisation of the national space sector and its technological autonomy, raising a new generation of space users whose core-business is not necessary satellite design and/or operation, but who have a strategic interest in demonstrating their capabilities in key-technology fields. Secondly, the technological progress, as observed in all technical and scientific areas, leading to a continuously improved design, miniaturisation, integration and production of components, together with global standardisation. Thirdly, a facilitation of knowledge exchange and dissemination, notably through the Internet. Finally, the growth of launch services and of launch capacity has the effect that small satellites and very small satellites provide economical and technical solutions to distribute financial risk associated to launch services and facilitate a more sustainable business model.

The phenomenon calls for an effective intervention from states. Indeed, the ‘democratisation’ process implies a multiplication of activities, not limited anymore to traditional space actors, but extended to newcomers. Institutes, universities and startup companies can now benefit from access to space, notably (as it is the case in the European Union) in the framework of (inter) governmental support programmes. National legislation must be further developed or adapted to tackle issues with regard to this new involvement. Moreover, the type of missions induces a remarkable growth of space object populations and of radiofrequency use. Small satellites pose new questions
with regard to concerns and policies issued from the first age of the Space Era. The idea of ‘Space for All’ has now to be transposed from the states community to McLuhan’s Global Village.

II An Illustrative Case: The QB50 Mission

The QB50 Project has been initiated and cofunded by the European Commission within its Seventh Framework Programme for Research & Development. Participants in the project have contributed through the delivery of small satellites (‘CubeSat’ class) or payload instruments.

The main mission’s purpose is the study of the lower thermosphere – a relatively unknown region of the Earth’s atmosphere between 90 and 320 km of altitude – and of the re-entry process of space objects. The mission involves about 50 candidate CubeSats from institutes disseminated in some 40 countries all around the world, making it the widest international space cooperation to date. The project is placed under the coordination of the ‘Institut Von Karman pour la Dynamique des Fluides’ (vK1), which acts as maître d’oeuvre vis-à-vis the European Commission.

Operation of CubeSats and of their payload rests in principle with the institute of origin (that is use of radiofrequencies, telemetry, and so on). Specific agreements may however be concluded in case a participating country would not have the capacity for ground control. Some CubeSats will be equipped with autonomous propulsion means, while the majority will not be manoeuvrable once positioned in orbit. The project implies two launches: the first launch took place on 19 June 2014. Three CubeSats were successfully launched for test and validation purpose in the frame of the QB50 Precursor Flight mission, using a Dnepr launcher from the Yasny base in Russia. The main mission is scheduled for 2015/2016: after the abandonment of the launch solution using a Cyclon-4 rocket from Alcantara, Brazil, a new launch opportunity is currently assessed using the International Space Station (ISS) as a platform for the positioning of a majority of the 50 CubeSats involved. The rest of the CubeSats should be launched at a later stage, using more conventional launch solutions.

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1 See the website of the QB50 Project: <https://www.qb50.eu/>.
3 The solution had to be abandoned after the cancellation of the Ukraine-Brazil joint venture in launch services provision from Alcantara, in 2015.