Chapter 5
Suborbital Spaceflight: Legal Aspects

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ABSTRACT
The chapter outlines the legal aspects of suborbital spaceflight under international law with the aim of clarifying upcoming legal challenges to the existing space treaties. One of major problems lies in the applicability of air law to the spaceflight. In the case of using aircraft-type reusable launch vehicle (RLV), it fits into the definition of aircraft in air law. The other problems are also addressed, which include the different legal status of airspace and outer space, the lack of specific concepts and terms related the flights in the existing space treaties, and a need for international regulation to ensure safety in the flights. It concludes with recommendations for the present space traffic management.

INTRODUCTION
Suborbital flights highlight legal questions between space law and air law. When Reusable Launch Vehicle (RLV) such as the U.S. Space Shuttle started operational for scientific purposes, the questions mainly focused the definitions of outer space and spacecraft to clarify the applicability of space law to them. In the 1990s when private entities started entering into space activities, feasibly studies on the use of RLV for commercial purposes were explored and one of the representative business models was “space tourism”. In order to provide commercial space flight to space tourists, further legal clarification was attempted to draw a line between astronauts and space tourists and the issues of state responsibility and liability were reviewed in the case of accidents caused by private entities.

On the other hand, a need for international regulatory framework for space transportation including the use of RLV for suborbital flights has been increasingly recognized in the name of Space Traffic Management (STM). It is a set of “rules of the road” to ensure safety in accessing to outer space by coordination of rules and to reduce risks posed by solving congestion of space objects and space debris in Earth orbit.

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Taking them into consideration, the present Chapter consists of: types of suborbital flight from the legal perspective; the general international framework applicable to suborbital flight; and development of international regulatory framework - STM.

**TYPES OF SUBORBITAL FLIGHTS FROM A LEGAL PERSPECTIVE**

“Public” or “Private”

Legally speaking, there are two types of suborbital flights which are: public suborbital flights and private suborbital flights.¹ While the former is carried out by states with their authorized astronauts, the latter is divided into two types which are private suborbital flight and suborbital space tourism. While the term “tourism” is defined by the World Tourist Organization (WTO) and the U.S. Statistical Committee in 1994 as “[t]he activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure”, (Launius & Jenkins, 2006) space tourism is defined by scholars as “any commercial activity offering customers direct or indirect experience with space travel” (Hobe & Cloppenburg, 2004) which does not exclude parabolic flights. (Von der Dunk, 2007) Recognizing the vague concept of space tourism, the term “private spaceflight” is to be used in the present legal study (Von der Dunk, 2015).

“Plane-Type” vs. “Rocket- Type”

With the advances in space technology, the suborbital flights have become certain type of transportation activities, different from satellite missions, and legal issues are often identified in legal gaps between the existing rules for aviation and space transportation. In short, there is the possibility of applying air law to the use of RLV for orbital flights.

Such a problem is derived from using certain types of launch vehicle for the flights. In general, there are two types of launch vehicles originated in the beginning of space era: a rocket with a capsule on a top which was used for the Mercury manned exploration in 1961; and an aircraft-type vehicle which are equipped with a reaction control system, used to explore the lower end of the hypersonic flight regime in 1963. (Jakhu, Sgobba & Dempsey, 2011) Those two models still remain appropriate for the suborbital flights and most of legal issues debated in the 1980s were related to the aircraft-type vehicle such as Space Shuttle developed by the U.S. In the 1990s, similar legal studies attracted attention again when private entities started entering into space business by planning the use of the aircraft-type vehicle for the flight, namely, space tourism. Afterwards, with the increasing number of actors involved in suborbital flights, a need for international regulatory framework “Space Traffic Management (STM)” has been recognized to ensure safety in space transportation.

In the context of a distinction between manned and unmanned suborbital flight, it should be noted that neither Inter-Continental Ballistic Missiles (ICBMs) nor Fractional Orbital Bombardment System (FOBS) are RLV to which space law applies, even though they reach into Low Earth Orbit (LEO) and de-orbit before completing their first full orbit.