Legal Considerations for Commercial Space: An Overview

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ABSTRACT

This article provides a basic overview of the legal and regulatory obstacles facing new entrants to the commercial space industry. It is meant to provide access to the essential primary sources of space law for those who wish to learn more about the direct relevance of space law to space business. This high-level review of space law is intended to provide a picture of the reach and complexity of space law (as well as its overlap with other fields of law). The interconnections between international law and national law/regulations are highly emphasized. The article begins with a summary of the key provisions of the Outer Space Treaty, including commentary meant to assist commercial actors to ascertain the relevance of each such provision to their business model. It then leads into a brief discussion of other international space law instruments such as the other four COPUOS treaties and relevant International Telecommunications Union instruments. The discussion of national space law focuses on the United States, as a state with significant space activities and well-developed laws and regulations for commercial space actors.

INTRODUCTION

merging commercial space actors have to face a variety of hurdles before they can successfully engage in space activities. These hurdles can be legal, regulatory, financial, or operational in nature. This article focuses on the legal and regulatory issues, though these necessarily often implicate financial and operational concerns, and attempts to demonstrate the extent to which these hurdles are not insurmountable, providing they are tackled with the appropriate approach that emphasizes the importance of performing legal and regulatory due diligence early in the process.

Laws and regulations are developed in a particular context. In the case of space, this context is heavily rooted in international law and the understanding that space activities are inherently high-risk activities. Though there is a great deal of risk involved in participating in such activities, there is also potentially a great deal of reward available, both financially and in terms of prestige, to those individuals and entities who are bold enough to seek participation in the space arena in the near term.

KEY ELEMENTS OF INTERNATIONAL SPACE LAW

In general, states that are host to space activities have national legislation in place to ensure their compliance with the international space law regime, particularly the Outer Space Treaty, to which there is near-universal subscription.¹ A summary of key provisions of the Outer Space Treaty, with brief commentary relevant to new space business interests, follows:

- Freedom of use. Space is free for the exploration and use of all States, which is to be carried out both for the benefit and in the interests of all States. This principle includes a freedom of scientific investigation, which is to be facilitated and encouraged by international cooperation. (Article I) This nondiscriminatory principle is inherently beneficial for those entities wishing to undertake space activities, as it secures their right (with state authorization, see Article VI) to do so.
- Nonappropriation. Space cannot be appropriated by use, occupation, or other means. This includes both "territory" which may be found on celestial bodies, as well as positions in space such as orbital slots. (Article II) This widely accepted principle can be seen as problematic for the commercial space industry, as it could foreseeably limit the rights of a state or entity that may have invested substantial capital into a space project with the express purpose of utilizing one or more specific areas of space. While it could be particularly problematic for those seeking to utilize natural resources that are found in space or to set up human settlements in space, it has not yet proved problematic for those states and entities that have substantially invested in geostationary communications. International agreements have been reached to deal with concerns regarding long-term satellite placement.
- Incorporation of international law. *Exploration and use* of space are to be carried on in accordance with international law, in order to maintain international peace

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and security. (Article III) General international law is substantially more well-developed and tested than the *lex specialis* of space law, and thus provides a more substantial legal basis for understanding interactions between international or multinational entities in space, as well as the protection of the UN Charter, which is specifically cited by this treaty article. Article 38.1 of the Statute of the International Court of Justice provides insight into the sources of international law.²

- Peaceful use of space. Weapons of mass destruction, including nuclear weapons, cannot be placed in orbit around the earth, on celestial bodies, or otherwise stationed in outer space. The placement of military installations or conduct of weapons testing or military maneuvers on celestial bodies is expressly prohibited (though the use of military personnel, equipment, and facilities for peaceful purposes is permitted). (Article IV) While this article does restrict the development of weapons in space, it provides for a stable, peaceful environment in which to conduct business, and clarifies the extent to which military personnel and equipment may be utilized.
- Assistance to astronauts; dangerous phenomenon. Astronauts are to be rendered all possible assistance in the event of an accident, distress, or emergency landing on the territory of another State and returned promptly to their spacecraft's State of registry. Astronauts are to render all possible assistance to other astronauts of other States in carrying on space activities. It is required for a State to immediately inform other States Parties to the Outer Space Treaty of any phenomena in outer space that could present a danger to astronauts. (Article V) This provision is only relevant to those activities that involve human spaceflight. While the term astronaut is problematically undefined in either the Outer Space Treaty and the Return and Rescue Agreement, it is likely to be construed in a broad way that protects human lives,³ including the lives of those individuals who may be more like passengers than traditional astronauts. In the event that human spaceflight becomes more common, this provision helps to clarify the rights and obligations that will exist between such human participants. Given the breadth of issues raised by space activities that involve human participants, the topic is largely beyond the scope of this article.
- State responsibility for national activities. States bear responsibility for activities of their nationals in space (which can include both natural and corporate persons), including for their compliance with the Outer Space Treaty. They are to authorize and provide continuing supervision for any such space activities. In the case of activities car-

ried on by an international organization, responsibility falls both to the international organization and the State participants in the organization who are parties to the Treaty. (Article VI) This provision is the basis for national space legislation, unusually placing responsibility for private activities on states. From a business perspective, it is important to be aware of an individual state's policy in terms of promoting its space activities and/or protecting itself from responsibility and liability for such activities.

- State liability. Each State bears liability for damage its space objects or their component parts may cause to another State (including natural and corporate persons), whether such damage is caused on the Earth, in the air, or in space. (Article VII) Risk management is a key feature of any business plan, arguably more so in space. The placement of liability with the state of registry means that states are more likely to include stringent insurance and/or other financial requirements on space actors in their national space legislation (though this is not always the case; Japan, for example, is willing to absorb liability in exchange for promoting its national space industry).⁴
- Jurisdiction and control. The State of registry retains jurisdiction and control over a space object, as well as the personnel of that space object. The placement of an object in space, or its subsequent return to Earth, does not affect the ownership of such objects. If such objects or their component parts are found beyond the limits of the registering State, they are to be returned, though identifying data may be required from the State of registry. (Article VIII) This article guarantees continuity of ownership, which is extraordinarily important for space enterprises. Of course, the private ownership laws of the state of registry will be of paramount importance in dealing with an entity's property, and should be considered when selecting a registry state (which, by the rules of the Registration Convention, must also be a launching state-a state that either launches or procures the launch of a space object, or from whose territory or facility such an object is launched.⁵)
- Due regard. Space activities are to be carried on with due regard to the corresponding interests of other States. The principle of due regard includes both environmental considerations and noninterference with other States' activities. Harmful contamination of outer space is to be avoided, as is adverse change to the Earth's environment from the introduction of extraterrestrial matter. States are required to undertake international consultations if they have reason to believe that their activities will cause "harmful interference" to another State's activities. A State believing its activities may be harmfully interfered with by another

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State's activities may also request such a consultation. (Article IX) While this provision to some degree limits the operational freedom of an entity carrying out space activities in terms of environmental considerations, the requirement for consultations if it seems likely to an actor that their activities will harmfully interfere with those of another state's actor, and the call for implementation of the principle of cooperation, it also attempts to protect those activities from actors from other states. It is important to note that, because this provision is contained in a treaty formed between states, it does not serve to set standards of behavior for actors originating from the same state.

• Information sharing regarding planned activities. *States are to provide information to the "greatest extent feasible and practicable of the nature, conduct, locations and results" of their space activities. (Article XI) This provision is worth noting for those entities wishing to enter the space arena, as a reminder that space activities (along with their associated successes and failures) are highly public, and also highly scrutinized by the public.*

There are also four other treaties that set up specific obligations for their member states acting in space. These are the Return and Rescue Agreement, which primarily sets forth requirements for dealing with astronauts and space objects of one state that wind up in the territory of another state⁶; the Liability Convention, which creates liability regimes for space object-to-Earth/aircraft damage and space object-to-space object damage7; the Registration Convention, which mandates the creation of a national registry of space objects and communication of registration to the United Nations, where the space object will be placed on the international registry created by the Convention⁸; and the significantly lesssubscribed Moon Agreement, dealing with space activities on the Moon and other celestial bodies.⁹ There is substantial interconnectedness between the treaties. For example, registration of a space object performed in conformity with the requirements of the Registration Convention would qualify as a registration to grant jurisdiction and control over the object under Article VIII of the Outer Space Treaty. Among its myriad functions, the United Nations Office of Outer Space Affairs maintains a database of national space legislation,¹⁰ as well as a record of registered launches, ¹¹ and the text and ratification status of all five treaties.¹²

THE INTERRELATIONSHIP BETWEEN INTERNATIONAL AND NATIONAL SPACE LAW

Because the international regime places responsibility with the state of nationality for space activities, ¹³ individual states

will enforce their own requirements with regard to space activities. Of course, these requirements will include standards for obtaining authorization for launch and re-entry activities– which, in the United States, is handled by the Federal Aviation Administration (FAA).¹⁴ In general, undertaking a launch includes significant elements of analysis, including risk assessment, policy review,¹⁵ and environmental review.¹⁶ While environmental impact assessment can determine whether or not a launch is approved, assessment of the maximum probable loss (MPL) in case of a failure will determine the levels of liability for a launch, including how much insurance (or funding, in the case of self-insurance) must be obtained in order for the launch to go forward.¹⁷

Under this regime, the launch or reentry licensee must obtain insurance to cover claims of third parties based upon the MPL, or otherwise demonstrate financial responsibility, not to exceed the lesser of \$500 million (which is periodically adjusted for inflation) or the maximum available on the world market at reasonable cost.¹⁸ The U.S. government, subject to appropriations, may pay third-party claims in excess of the required insurance up to \$1.5 billion (periodically adjusted for inflation) above the amount of the MPL-based insurance.¹⁹ Above this indemnification, the licensee or legally liable party will retain financial responsibility.²⁰ Insurance is the thirdhighest cost of a space activity (after research and development and launch costs), and thus should not be unduly laid aside as a secondary concern.

It is worth noting that, while the FAA retains jurisdiction over launch and reentry activities, it does not specifically hold jurisdiction with regard to on-orbit activities, meaning in the understanding of some authors "that the risk-sharing regime would not extend to cover an accident that occurred in orbit."²¹ On-orbit activities are not specifically excluded in that loss must result from a "permitted or licensed activity," meaning that on-orbit activities theoretically would fall within the scope of the financial responsibility requirements.²² However, the financial responsibility requirements are placed upon launch or reentry licensees on the basis of an MPL that would result from licensed launch or reentry activities. MPL calculations only take into consideration on-orbit risk analysis with respect to "assessing risks posted by a launch vehicle to operational satellites" (emphasis added).²³ It is unclear when an event becomes too attenuated from the launch to be considered eligible for consideration under the risk-sharing regime²⁴; a requirement for damage to be proximately caused by the launch or re-entry event may exist.²⁵

Orbital slots and radio frequencies must be allocated or registered by the International Telecommunication Union, a United Nations body with authority over those aspects of

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space activities.²⁶ Member states are bound by the ITU's Constitution, Convention, and Radio Regulations (which are deemed incorporated by reference into the treaty requirements).²⁷ As such, much like with regard to the Outer Space Treaty, states have a vested interest in maintaining their nationals' compliance with these international obligations.

Care must be used in determining the correct radio frequencies to use, not just from a technical and operational standpoint, but also from a legal one. For example, in the United States, the Federal Communications Commission (FCC) regulates radio frequency usage for mobile stations within U.S. jurisdiction (which would include those that are spacebased) and for any fixed or mobile stations operating within the United States or on a U.S. aircraft or vessel.²⁸ "The satellite space station licensing process is composed of three distinct processes: allocating available spectrum for the proposed satellite service, developing service rules and granting licenses to qualified applicants."²⁹ Once established, such usage must then be carried out without causing harmful interference to other states' equipment.³⁰ Additionally, the National Oceanic and Atmospheric Administration (NOAA) carries out licensing for any satellite with remote sensing capabilities.³¹

Export controls are another critical area of importance for space actors, particularly if such actors are from the United States or dealing with U.S. partners for any stage of the space activity. Compliance with U.S. export controls, known as International Traffic in Arms Regulations (ITARs) in the case of the Munitions List³² and Export Administration Regulations (EARs) in the case of the Commerce Control List,³³ can be a costly and time-consuming endeavor. In the context of ITARs, exporting is broadly defined and includes physically sending or taking an article beyond the borders of the United States; transferring control or ownership (including an on-orbit transfer); and, notably, disclosing technical data to foreign persons (whether they are located in the United States or elsewhere, and regardless of whether the disclosure is oral or visual).³⁴ Therefore, it should be apparent that a significant degree of care is required to remain in good standing.

Finally, space debris is a critical consideration for any space activity, in terms of both the safety of the activity and the responsibility of the actor to mitigate creation of further debris. Expendable launch stages, fragments of spacecraft, and dead satellites all contribute to the dangerous and ever-growing space debris problem. While there are no additional binding requirements at an international level regarding the creation of space debris, there are soft law guidelines available.³⁵ Additionally, individual space-faring states have begun to implement their own requirements for the mitigation of space debris that must be taken into consideration for planning any future activity.

CONCLUSIONS

Despite some similarities with the Antarctic and high-seas regimes, the context for space activities is unique. State responsibility for national actors in space creates an essential connection between national legislation and regulation of space and the international space law regime. Though different states will vary in their approach to authorization and continuing supervision, it is essential for commercial space actors to understand the basic framework in order to understand and perform appropriate due diligence regarding the areas in which they may be regulated. The Outer Space Treaty, the ITU Constitution, and the databases of information available on the UNOOSA website provide useful stepping-off points for those interested in a greater understanding of the legal and regulatory implications of engaging in commercial space activities.

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