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LAW AND REGULATION GOVERNING U.S. COMMERCIAL SPACEPORTS: LICENSING, LIABILITY, AND LEGAL CHALLENGES

MICHAEL C. MINEIRO*

"Hitch Your Wagon to a Star"
—Ralph Waldo Emerson

I. INTRODUCTION

IN RECENT YEARS the United States has seen a surge in interest in commercial spaceports.1 States are passing innovative laws to support the development of commercial spaceports in their territory.2 Airports are being converted into spaceports3 and private investors are funding the construction of spaceport facilities to serve a new generation of reusable launch vehicles and support the emerging commercial human space flight market.4

Whether to advise a private customer, a corporate executive, or a legislative body, this new-found interest and investment in spaceports creates new demand for legal counsel versed in U.S. law and regulation governing commercial spaceports. To that end, this article assesses the law and regulation of commercial

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4 See Developments and Concepts, supra note 1, at 1.
spaceports in the United States. This assessment begins with an overview of spaceports, the history of their development in the United States, and an examination of commercial spaceports currently licensed by the Federal Aviation Administration ("FAA"). Thereafter, relevant provisions of corpus juris spatialis are identified and assessed for their application to commercial spaceport activities in the United States. U.S. federal and state laws governing commercial spaceport activities are examined with special consideration given to licensing, liability, and commercial spaceport initiatives. Recommendations are given on ways spaceports can legally limit their liability exposure. Other legal issues, such as the operation of international spaceports, are also discussed. Finally, recommendations are given to law and policy makers for legal and regulatory reforms to better facilitate commercial spaceport development and operation.

II. SPACEPORTS: AN OVERVIEW

Outer space commercial transportation consists of three primary actors: (1) Launch Vehicle Manufacturers, (2) Launch Site Operators (i.e., Spaceports), and (3) Launch Service Providers. Commercial spaceport operators are one part of the larger commercial space transportation industry.

The term spaceport is not defined in either international law or U.S. federal law. Spaceport is defined in the Oxford English Dictionary as "a base from which spacecraft are launched; (in fiction) a base at which spaceships take off and land."5 Corpus juris spatialis references territory or facilities from which a space object is launched.6 U.S. federal law parallels corpus juris spatialis language, using the terms "launch sites" and "reentry sites."7 A "launch site" is defined as "the location on Earth from which a launch takes place (as defined in a license the Secretary [of Transportation] issues or transfers under this chapter) and nec-

5 Oxford English Dictionary Online (2008), http://dictionary.oed.com. This definition is antiquated because it is no longer a "fiction" that spacecraft can take off and land. I recommend the editors of the Oxford English Dictionary update this section.

6 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, art. VII, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty] ("Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched").

A "reentry site" is "the location on Earth where a reentry vehicle is intended to return." While U.S. federal law does not use the term spaceport, the FAA has recognized that launch and reentry sites are often referred to as spaceports. For the purposes of this article, the term spaceport (unless otherwise indicated) references launch and reentry sites as defined by FAA regulations.

The services spaceports can offer vary greatly depending on their location, facilities, and applicable law. Launch trajectory and cost efficiency to achieve trajectories are determined by the location of the spaceport. Insurance costs are directly related to maximum probable loss assessments that are based on launch parameters related to spaceport location. Launch and reentry vehicles must be supported with mission-specific facilities such as launch pads, payload processing and integration, and telemetry, tracking, and control. Spaceports supporting reusable launch vehicles ("RLVs") and human space flights must have additional facilities to serve spaceflight participants ("SFPs"), crew, and vehicle operations. Applicable law may prohibit or restrict certain types of spaceport activities at certain times and under certain conditions. Other factors to consider are environmental constraints, weather trends, air traffic flow patterns, and spaceport scheduling assurance.

Commercial spaceports can be divided into two categories: (1) Spaceports that specialize in supporting RLVs, SFPs, and horizontal take-off and landing vehicles ("HTOLs") and (2) spaceports that specialize in supporting expendable launch vehicles ("ELVs").

The services commercial spaceports offer to their customers can vary from simply renting or leasing spaceport infrastructure to providing complete launch services. As will be discussed in Section VI of this article, the type of services spaceports offer will impact their liability exposure and the application of mandatory cross-waiver provisions.

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9 Id.
10 DEVELOPMENTS AND CONCEPTS, supra note 1, at 46.
In the United States, spaceports can be owned and operated by either the government or private entities. U.S. federal government owned and operated spaceports are termed "federal ranges." U.S. federal ranges are exempt from the FAA’s Office of Commercial Space Transportation ("FAA-AST") licensing and regulation when carrying out activities for the U.S. government. Private spaceport operators often work in partnership with federal ranges, utilizing federal facilities and launch support services. State and local governments can also operate spaceports. In the United States there are six licensed, non-federal spaceports with three co-located on federal launch sites.

In the early days of the space age, federal spaceports served only military and civilian government agencies. However, once commercial space activities (i.e., telecommunications) developed, the federal ranges were opened up to serve the commercial space sector. Nonetheless, it was not until 1998 that the first non-federal spaceport was licensed in the United States.

Although the primary purpose of federal ranges is to serve the needs of the U.S. government, federal spaceports can serve commercial customers as well. When federal spaceports undertake commercial activities (i.e., operation of a launch site for non-government space activity), they are subject to licensing and regulation as commercial spaceports, even though they are not commercial spaceports. Spaceports that operate for the purpose of providing a service to the general public are regulated as commercial spaceports regardless of whether they are owned by government or private entities. In the United States, the six licensed, non-federal spaceports happen to be commercial spaceports, but this is not a prerequisite to operating a non-fed-

13 DEVELOPMENTS AND CONCEPTS, supra note 1, at 46.
14 See id.
16 DEVELOPMENTS AND CONCEPTS, supra note 1, at 46.
17 Id.
18 Id.
19 See id.
20 Id.
21 Id.
23 See id.
eral spaceport. Likewise, the federal government could choose to operate a commercial spaceport.

In the United States, the six licensed, non-federal commercial spaceports are:

(1) California Spaceport (Vandenberg AFB, California). This spaceport is co-located on a federal range at latitude 34°45' N and longitude 120°31' W. Spaceport Systems International, the licensed launch site operator, provides payload and launch services for private and government users. "California Spaceport can support a variety of mission profiles to low-polar-orbit inclinations, with possible launch azimuths ranging from 220° to 165°." Spaceport commercial launch facilities can accommodate a variety of vehicles including the Delta II and Minotaur IV.

(2) Cape Canaveral Spaceport (Cape Canaveral, Florida). This spaceport is co-located on a federal range at latitude 28°28' N and longitude 80°32' W. Space Florida, the licensed site operator, provides payload and launch services for private and government users. Spaceport facilities include an RLV support complex. Only small ELVs can be supported.

(3) Kodiak Launch Complex (Kodiak Island, Alaska). This spaceport is located at latitude 57°26' N and longitude 152°20' W. Alaska Aerospace Development Corporation, the licensed operator, provides payload processing and launch services to private and govern-

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24 DEVELOPMENTS AND CONCEPTS, supra note 1, at 47.
25 See id. at 55.
26 Id. at 47.
28 DEVELOPMENTS AND CONCEPTS, supra note 1, at 48.
29 Id.
30 Id. at 49.
31 Id. at 47.
33 DEVELOPMENTS AND CONCEPTS, supra note 1, at 49.
34 Id. at 47.
35 Id. at 49-50; see also Space Fla., http://www.spaceflorida.gov/spaceport.php (last visited Sept. 2, 2008).
36 DEVELOPMENTS AND CONCEPTS, supra note 1, at 47.
Kodiak supports mission profiles to Low Earth Orbit, polar, and Molniya elliptical orbits. Kodiak commercial launch facilities can launch up to Castor 120-based vehicles.

(4) Mid-Atlantic Regional Spaceport (Wallops Island, Virginia). This spaceport is co-located on a federal range at latitude 37°50' N and longitude 75°29' W. Virginia Commercial Space Flight Authority, the licensed operator, provides payload processing and launch services to private and government users. This spaceport supports a variety of mission profiles and can accommodate a variety of small and medium ELVs.

(5) Mojave Air and Spaceport (Mojave, California). This spaceport is located at latitude 35°04' N and longitude 118°09' W. East Kern Airport District is the licensed operator. This spaceport is designed to support suborbital launches and reentries of RLVs.

(6) Oklahoma Spaceport (Washita Country, Oklahoma). This spaceport is located at latitude 35°20' N and longitude 99°12' W. Oklahoma Space Industry Development Authority is the licensed operator. This spaceport is designed to support horizontal take-off and landing RLVs.

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38 DEVELOPMENTS AND CONCEPTS, supra note 1, at 50.
39 Id.
40 Id. at 51; see also Alaska Aerospace Dev. Corp., http://www.akaerospace.com/ (last visited Mar. 13, 2008).
41 DEVELOPMENTS AND CONCEPTS, supra note 1, at 47.
43 DEVELOPMENTS AND CONCEPTS, supra note 1, at 52.
45 DEVELOPMENTS AND CONCEPTS, supra note 1, at 47.
47 DEVELOPMENTS AND CONCEPTS, supra note 1, at 53.
49 DEVELOPMENTS AND CONCEPTS, supra note 1, at 47.
51 DEVELOPMENTS AND CONCEPTS, supra note 1, at 54.
52 Id.; see also Okla. Space Indus. Dev. Auth., supra note 2.
In addition to licensed launch sites, U.S. law does allow for exclusive private use launch sites in certain instances.\textsuperscript{53} These sites are not open to the commercial public and are not authorized to serve as commercial spaceports.

III. INTERNATIONAL LAW

International law is "[t]he legal system governing relationships between nations."\textsuperscript{54} International law is composed of literally thousands of treaties, agreements, resolutions, and judicial decisions. Within this vast body of law, a host of relevant provisions apply to outer space-related activities. Five treaties have been drafted and adopted specifically as agreements on outer space, and they comprise the \textit{corpus juris spatialis}.\textsuperscript{55} Of these five treaties, four have been signed, ratified, and entered into by the United States: Outer Space Treaty (1967),\textsuperscript{56} Rescue Agreement (1968),\textsuperscript{57} Liability Convention (1972),\textsuperscript{58} and Registration Convention (1975).\textsuperscript{59} Due to the breadth of international law, this chapter will only assess international obligations relevant to U.S. spaceport activities established under these four treaties.

The U.S. government is obligated to carry out its activities consistently with obligations assumed under international law and in accordance with the U.S. Constitution.\textsuperscript{60} In the United

\textsuperscript{53} See Experimental Permits for Reusable Suborbital Rockets, 72 Fed. Reg. 17,001, 17,004 (Apr. 6, 2007). "In 2000, the FAA announced that a launch licensee who operated a private site for its own launches did not need a license to operate a launch site." \textit{Id.}

\textsuperscript{54} \textit{BLACK'S LAW DICTIONARY} 835 (8th ed. 2004).


\textsuperscript{56} See Outer Space Treaty, \textit{supra} note 6.

\textsuperscript{57} Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter Rescue Agreement].


\textsuperscript{59} Convention on Registration of Objects Launched into Outer Space, June 6, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter Registration Convention].

\textsuperscript{60} ANTHONY AUST, \textit{MODERN TREATY LAW AND PRACTICE} 179 (2d ed. 2007) ("Article 26 [of the Vienna Convention on the Law of Treaties 1969] contains the fundamental principle of the law of treaties: \textit{pacta sunt servanda.}"). Also note that Article VI of the U.S. Constitution establishes that Treaties entered into pursuant to the Constitution are the law of the United States:

This Constitution, and the Laws of the United States which shall be made in Pursuance thereof; and all Treaties made, or which shall be made, under the Authority of the United States, shall be the
States, the Secretary of Transportation ("SOT") is responsible for licensing and regulating commercial space activities, including spaceports. Therefore, any licensed spaceport must act consistently with the international obligations of the United States, including corpus juris spatialis.

Corpus juris spatialis contains provisions relevant to the operation of spaceports, which should be duly considered by the United States when licensing and enforcing licenses, as well as by licensees when operating spaceports. However, a meaningful assessment of these provisions must recognize that in many ways, corpus juris spatialis is inadequate when applied to spaceport operations. To understand these inadequacies, the treaties should be placed within the historical context of time when they were drafted. First, commercial spaceports were not in operation when the treaties were drafted, and the language of the treaties assumes that spaceports will be state owned and operated. Second, RLVs were not in operation and commercial space transportation, in particular the carriage of human beings for remuneration, was not yet a practical undertaking. Thus, the treaties contain no provisions explicitly for these activities.

Spaceports can be classified as either terrestrial (i.e., located on Earth) or non-terrestrial (i.e., not located on Earth). This distinction is important when considering obligations under corpus juris spatialis because in some instances, obligations apply only to activities in outer space. This paper will only assess provisions applicable to terrestrial spaceports.

Five articles of the Outer Space Treaty contain provisions directly relevant to terrestrial spaceport operations. Thus, Article II prohibits spaceport activity as a means to claim national appropriation over outer space. Article IV prohibits spaceports from serving as launch sites for placing nuclear weapons or
other kinds of weapons of mass destruction into orbit or for stationing such weapons in outer space.65 Article V requires spaceports to "regard astronauts as envoys of mankind."66 It is unclear whether spaceports must regard commercial human space flight participants and crews as astronauts. Article VII establishes an international liability regime applicable to States from whose spaceports an object is launched.67 Article VI of the Outer Space Treaty requires States to authorize and continually supervise the space activities of non-governmental entities, including commercial spaceport operators.68 Interestingly enough, Article VI only applies to terrestrial spaceport activities to the extent they are activities "in outer space."69

It remains open to interpretation as to what terrestrial spaceport

65 Id. art. IV. "States Parties to the Treaty undertake not to place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner." Id.

66 Id. art. V. "States Parties to the Treaty shall regard astronauts as envoys of mankind in outer space and shall render to them all possible assistance in the event of accident, distress, or emergency landing on the territory of another State Party or on the high seas." Id.

67 Id. art. VII.

Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air space or in outer space, including the moon and other celestial bodies.

68 Id. art. VI.

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty. When activities are carried on in outer space, including the moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.

69 Id. (stating that "national activities in outer space" and "non-governmental entities in outer space" are subject to authorization and continued supervision (emphasis added)).
activities are subject to Article VI, because the term “in outer space” is not defined in the Outer Space Treaty. A narrow reading of the term “in outer space” would exclude terrestrial spaceport activities unless they were directly related to a present activity in outer space. A wider reading would include terrestrial spaceport activities involved in the preparation of outer space activities. It is this author’s opinion that Article VI should be read narrowly, applying only to terrestrial activities directly related to present activities in outer space. A narrow reading does not preclude States from authorizing and supervising terrestrial activities prior to them taking place in outer space. On the contrary, in order to fulfill Article VI obligations, States will need to authorize a space activity before it occurs in outer space, and will need to supervise preparatory activities to ensure that the planned activity will be in accordance with international law and applicable corpus juris spatialis. As a result, whether or not one interprets the term “in outer space” narrowly or widely, States are obligated to authorize and supervise activities prior to them taking place in outer space.

The Rescue Agreement contains several interesting provisions applicable to spaceports. These provisions are especially relevant in the event that a vehicle (most likely a RLV) carrying personnel lands either intentionally or unintentionally at a spaceport. The Rescue Agreement does not define personnel, and it is unclear whether commercial spaceflight participants or crew are granted the status of personnel. Nonetheless, with the advent of commercial space flights, it is quite possible spaceflight participants and/or crew will be on a RLV that may, “owing to accident, distress, emergency or unintended landing,” land the spacecraft at a spaceport. In this event, what provisions, if any, of the Rescue Agreement apply? If spaceflight participants or crew are considered personnel, then the spacecraft and personnel are afforded the full protections of the Rescue Agreement, and States should require their commercial spaceport operators, either through licensing or regulation, to undertake the following actions in order to fulfill State obligations under the Rescue Agreement:

(1) First, spaceport operators must “take all possible steps to rescue [the personnel] and render them all necessary assistance.” This will include providing clearance

70 See Rescue Agreement, supra note 57, art. 2.
71 Id.
for emergency landings, undertaking emergency rescue actions once the spacecraft has landed at the spaceport, and providing medical or other assistance necessary for the safety and health of the personnel.

(2) Second, spaceport operators must also “extend assistance in search and rescue operations for such personnel to assure their speedy rescue.” This provision will be most relevant in the event the spacecraft lands near a spaceport or personnel are missing from the spacecraft that has landed at a spaceport.

(3) Third, spaceport operators shall assist the national and local government authorities in promptly returning the personnel to representatives of the launching authority. Spaceport operators cannot detain personnel in-

If, owing to accident, distress, emergency or unintended landing, the personnel of a spacecraft land in territory under the jurisdiction of a Contracting Party, it shall immediately take all possible steps to rescue them and render them all necessary assistance. It shall inform the launching authority and also the Secretary-General of the United Nations of the steps it is taking and of their progress. If assistance by the launching authority would help to affect a prompt rescue or would contribute substantially to the effectiveness of search and rescue operations, the launching authority shall cooperate with the Contracting Party with a view to the effective conduct of search and rescue operations. Such operations shall be subject to the direction and control of the Contracting Party, which shall act in close and continuing consultation with the launching authority.

Id.

72 Id. art. 3.

If information is received or it is discovered that the personnel of a spacecraft have alighted on the high seas or in any other place not under the jurisdiction of any State, those Contracting Parties which are in a position to do so shall, if necessary, extend assistance in search and rescue operations for such personnel to assure their speedy rescue. They shall inform the launching authority and the Secretary-General of the United Nations of the steps they are taking and of their progress.

Id.

73 Id. art. 4.

If, owing to accident, distress, emergency or unintended landing, the personnel of a spacecraft land in territory under the jurisdiction of a Contracting Party or have been found on the high seas or in any other place not under the jurisdiction of any State, they shall be safely and promptly returned to representatives of the launching authority.

Id.
definitely or attempt to hide their existence from representatives of the launching authority.

Article 5 of the Rescue Agreement requires States to notify the launching authority and the United Nations when "a space object or its component parts has returned to Earth in territory under its jurisdiction." Implicit in Article 5 is that the territory where a space object lands is not the territory of the launching authority. Article 5 fails to state, either explicitly or implicitly, a condition of the space object’s return to Earth premised on an accident, distress, emergency, or unintended landing. As a result, the language of Article 5 requires notification every time a vehicle lands at a spaceport that is not in the launching authority’s territory, even if the landing was not an emergency. Therefore, it appears that States should require their spaceport operators to notify relevant State authorities of every vehicle not registered with the launching authority of that State that lands at the spaceport. Such an event may become a common occurrence once RLVs undertake international commercial transportation, landing and taking off at spaceports in different State territories.

Under the Liability Convention, “State[s] from whose territory or facility a space object is launched” (i.e., a spaceport) are considered launching States. Two types of liability can potentially attach to launching States under the Liability Convention. First, launching States are “absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight.” Second, launching States are subject to fault liability “[i]n the event of damages being caused

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74 Id. art. 5(1).

Each Contracting Party which receives information or discovers that a space object or its component parts has returned to Earth in territory under its jurisdiction or on the high seas or in any other place not under the jurisdiction of any State, shall notify the launching authority and the Secretary-General of the United Nations.

75 See id.

76 See id.

77 See id.

78 See Liability Convention, supra note 58, art. I(c)(ii). Article I(c)(ii) states that the term “launching state” means “a State from whose territory or facility a space object is launched.” Id. A “launching state” is also defined in Article I(c)(i) as “a State which launches or procures the launching of a space object.” Id. art. I(c)(i). Spaceports fall under the definition of Article I(c)(ii).

79 Id. art. II.
elsewhere than on the surface of the earth." So long as a State is a launching State, liability attaches regardless of whether a State authorized or supervised spaceport operations. Therefore, in order to prevent unauthorized spaceport activities from resulting in State liability, States should only allow spaceport operations that are regulated and enforced.

The Registration Convention establishes a mandatory system of registering objects launched into outer space. Launching States are required to register the launched space object in both a national registry and a United Nations registry. Similar to the Liability Convention, a launching State includes "a State from whose territory or facility a space object is launched" (i.e., a spaceport). One flaw with this system is that RLVs launched on a regular basis are subject to a cumbersome registration requirement. The equivalent in aviation would be to require registration of airplanes every time they took off! Ultimately, this system will need to be modified to serve regularly scheduled, commercial RLV launches. For the time being, to assist States in fulfilling this obligation, States should require commercial spaceports to maintain records of all vehicles launched and to report these records to the appropriate State authority.

It is important to note that while Congress has recognized international obligations related to commercial launch activities and has vowed to ensure compliance with such obligations, Congress has not explicitly identified these obligations. Furthermore, in some instances international outer space law fails to properly define the scope and application of relevant treaty provisions. The result is concurrent conflicting legal obligations under international law. This issue stems primarily from a lack of clear legal delimitation between air space and outer space, as

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80 Id. art. III.
In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.

Id.

81 See id. art. II, art. III.

82 See Registration Convention, supra note 59. The Preamble of the Registration Convention states (in part): "Believing that a mandatory system of registering objects launched into outer space would, in particular, assist in their identification and would contribute to the application and development of international law governing the exploration and use of outer space." Id. at pmbl.

83 Id. art. II(1), III(1).

84 Id. art. I(a)(ii).
well as the related failure of treaties to appropriately draft terms clarifying application within this legal ambiguity.

IV. U.S. FEDERAL LAW AND REGULATION GOVERNING COMMERCIAL SPACEPORT ACTIVITIES

U.S. federal law and regulation governing spaceport activities derives from a system of federal governance established under the U.S. Constitution. The Constitution establishes three branches of government, each with their own authority and obligations.\(^8\) Congress enacts legislation, the Executive branch (i.e., President) implements the legislation, and the Judiciary ensures Congressional and Executive acts are within the bounds of law.\(^6\)

To that end, Congress has passed legislation to regulate commercial spaceports. This legislation is the Commercial Space Launch Act of 1984 ("CSLA") and related amendments.\(^7\) The CSLA and related amendments are codified in 49 U.S.C. § 70101 ("the Act"). Pursuant to this legislation, the Executive branch has issued regulations governing commercial spaceport activities ("Regulations"). In addition, the President has issued National Space Policy and Space Transportation Directives relevant to spaceport activities ("Directives"). Together, the Act, Regulations, and Directives are the primary laws and regulations governing U.S. commercial spaceport activity.

A. 49 U.S.C. § 70101

The CSLA is the principal law governing the licensing and regulation of commercial space transportation in the United States, including commercial spaceports.\(^9\) The Act does not apply to spaceport operations or other space activities the U.S. government carries out for the government.\(^1\) As originally enacted in 1984, the CSLA was limited to the regulation of ELVs and

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\(^8\) U.S. Const. art. I, art. II, art. III.
\(^6\) Id.
\(^1\) 49 U.S.C. § 70117(g) (2000).
launch sites. This regulatory authority was granted to the Department of Transportation ("DOT"). To implement this authority, the DOT established the Office of Commercial Space Transportation and, later, the Associate Administrator for Commercial Space Transportation ("AACST") under the administration of the FAA. In 1988, the CSLA was amended to provide a three-tier liability risk-sharing regime, including conditional indemnification for catastrophic accidents. In 1998, the CSLA was amended to extend DOT licensing authority to reentry licensing, allowing effective licensing of reentry sites and RLVs. In 2004, Congress amended the CSLA "[t]o promote the development of the emerging commercial human space flight industry," and granted the DOT the authority to implement regulatory standards to govern commercial human space flight.

With regards to commercial spaceports, the Act can be conveniently divided into six parts:

(1) The Opening Provisions. These consist of a statement of purposes, definitions, and a statement of general authority granted to the SOT.

(2) The Licensing Provisions. These explain when a license is required, the conditions to receive a license, the scope of licenses, and under what conditions and to what extent a license can be modified, transferred, suspended, or revoked.

(3) Post-Licensing Provisions. These establish SOT authority to monitor licensees and to enforce the Act and Regulations, assess penalties for violations of the Act and Regulations, and issue orders prohibiting, suspending, or ending a licensed activity.

(4) Financial Responsibility Provisions. These require licensees to obtain insurance or to demonstrate the ca-

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92 Hughes & Rosenberg, supra note 90, at 12.
94 Hughes & Rosenberg, supra note 90, at 13 n.41.
95 Id. at 16–17.
96 Id. at 19–20.
98 Hughes & Rosenberg, supra note 90, at 48.
100 Id. §§ 70104–70105, 70107.
101 Id. §§ 70106, 70108, 70115.
pacity to compensate for certain claims and establish federal indemnification provisions for certain catastrophic losses.\footnote{102}{Id. §§ 70112-70113.}

(5) SOT Regulatory Authority. These provisions establish and define the scope of SOT authority to issue regulations.\footnote{103}{See, e.g., id. §§ 70103, 70105, 70120(a).}

(6) Other Provisions. The Act also contains provisions regarding interagency consultation, space advertising, preemption of scheduled launches/reentries, acquisition of federal property and services, experimental suborbital rocket permits, human space flight related provisions, administrative hearings/review, and the relationship of the Act to other executive agencies, law, and international obligations.\footnote{104}{Id. §§ 70105a, 70109-70111, 70116-70117.}

1. Opening Provisions: Launch and Reentry Sites

As discussed earlier, the term spaceport is commonly used to refer to launch and reentry sites.\footnote{105}{See Part II supra notes 5-10.} The Act defines “launch site” as “the location on Earth from which a launch takes place (as defined in a license the Secretary issues or transfers under this chapter) and necessary facilities at that location.”\footnote{106}{49 U.S.C. § 70102(7) (Supp. 2004).} “Reentry site” is “the location on Earth to which a reentry vehicle is intended to return (as defined in a license the Secretary issues or transfers under this chapter).”\footnote{107}{Id. § 70102(15).} It is important to note that launch and reentry sites, as defined in the Act, do not necessarily exhibit characteristics generally associated with spaceports. Launch and reentry sites, in theory, may not have fixed launch infrastructure, launch services facilities, or other related buildings. Essentially, a launch site or reentry site could be as simple as an open stretch of desert. Spaceports, while not defined in the Act, tend to bring to mind a launch or reentry site with infrastructure to support operations. In this sense, launch and reentry sites, as defined in the Act, encompass a range of sites greater than the common usage of the term spaceport.
2. Licensing Provisions: General Scope and Requirement to Obtain

The SOT issues licenses to operate launch and reentry sites (i.e., spaceport operator licenses) "in accordance with the representations contained in the licensee's application, with terms and conditions contained in any license," and subject to compliance with the Act. The Act grants separate authorizations to licensees of launch sites and reentry sites, essentially creating a dual licensing regime. Launch site licenses "authorize[ ] a licensee to offer its launch site to a launch operator for each launch point for the type and any weight class of launch vehicle identified in the license." Reentry site licenses "authorize[ ] the licensee to offer use of the site to support reentry of a reentry vehicle for which the three-sigma footprint [i.e., the area a reentry vehicle will land within three standard deviations from the mean at the center] of the vehicle upon reentry is wholly contained within the site." 

As a result, spaceport operators that want to support launch and reentry activities must be licensed as both launch and reentry sites. This dual licensing regime is a product of the Act's historical development. Originally, the Act only granted the SOT authority over launch activities. Authority over reentry activities was not granted until the 1998 CSLA amendments. Congress added the reentry licensing language and failed to integrate launch and reentry site activities into one all-encompass-

109 Id. § 420.41(b).
110 Id. § 433.5. For a more detailed explanation of three-sigma footprints and reentry launch sites, see Commercial Space Transportation Reusable Launch Vehicle and Reentry Licensing Regulations, 64 Fed. Reg. 19,626 (Apr. 21, 1999).

The three-sigma footprint describes the area where the vehicle will land with a .997 probability rate, assuming no major system failure.

The statistical term "three-sigma" refers to three standard deviations from the mean, or average point, assuming a standard normal distribution. The area that is within three standard deviations from the mean point encompasses the area surrounding it with the mean at its center. An area within two or even one standard deviation of the mean point is a smaller, more precise measure; however, statistically there is less chance of an event falling within that range. The larger the area, the higher degree of confidence one has of an event falling within its boundary limits, assuming a normal distribution of events.

Id. at 19,638.
111 See id. at 19,631.
112 Id. at 19,630.
113 Id.
ing general spaceport/site license. Furthermore, issuance of a license to operate a launch or reentry site does not authorize a vehicle operator to use that site.\footnote{14} Before vehicle operators can utilize a spaceport they have to demonstrate through FAA-AST licensing procedures that the spaceport is suitable for the use proposed by the vehicle operator in accordance with the Regulations.\footnote{15}

Whether or not a launch or reentry site license (i.e., spaceport license) is required depends on the type of commercial space activity undertaken, who is performing the activity, where the activity is occurring, and whether or not the U.S. government has any agreements with foreign countries to provide jurisdiction over the activity.\footnote{16}

All individual citizens of the United States and entities organized or existing under the laws of the United States or a state of the United States (i.e., U.S. corporations) are required to have a license or permit for the operation of a launch or reentry site, regardless of the territory in which these activities take place.\footnote{17} This is consistent with an interpretation of Article VI of the Outer Space Treaty that obligates authorization and supervision of non-governmental activities undertaken by nationals, regardless of where the activity is taking place.\footnote{18}

U.S. citizens or corporations that operate spaceports in a foreign country will be required to comply with two legal licensing regimes: licensing as required under U.S. law and licensing as required under the law of the foreign country where activities are undertaken.\footnote{19} It is unclear what impact, if any, this dual licensing regime will have. What is clear is that a host of possible issues may arise, including:

(1) U.S. regulatory standards may impose additional costs upon U.S. spaceport operators as compared to foreign competitors (creating a cost disadvantage for U.S. spaceport operators);

(2) other States party to the Outer Space Treaty may not obligate licensing for nationals outside of their territory, resulting in a non-uniform interpretation and ap-

\footnote{14}{14 C.F.R. § 433.3.}
\footnote{15}{Id.}
\footnote{17}{49 U.S.C. §§ 70104(a), 70102(1) (2000).}
\footnote{18}{See Outer Space Treaty, supra note 6, art. VI.}
\footnote{19}{See 49 U.S.C. § 70104.}
plication of Article VI Outer Space Treaty obligations; and,

(3) U.S. citizens or corporations may attempt to skirt U.S. extraterritorial licensing requirements by operating spaceport ventures through foreign corporations.

The Act anticipates attempts by U.S. citizens or corporations to skirt U.S. extraterritorial licensing requirements and has created a long-arm statute requiring "an entity organized or existing under the laws of a foreign country if the controlling interest (as defined by the [SOT]) is held by an individual or entity" of the United States, to acquire DOT licenses to operate launch/reentry sites (i.e., spaceports).\textsuperscript{120} This long-arm provision applies when activities are undertaken outside the territory of either the United States or the territory of the foreign country where the entity is organized or exists.\textsuperscript{121}

While some may criticize the United States for this exercise of extraterritorial authority, the Act does remove a lacunae under international law, effectively shutting down flags of convenience for commercial spaceport operators (at least with regards to entities of the country in which a U.S. citizen or company maintains a controlling interest), where a foreign country does not exercise jurisdiction (and hence fails to authorize or supervise activities) outside of its territory (i.e., the high seas or outer space).\textsuperscript{122} This long-arm provision does not apply if there is an agreement between the U.S. government and the government of the foreign country (where the entity is organized or exists) which provides that the government of the foreign country has jurisdiction over the launch, operator, or reentry.\textsuperscript{123} The Act does allow for the application of the long-arm provision in the territory of a foreign country if there is an agreement between the U.S. government and the government of the foreign country (where the entity is organized or exists) which provides that the U.S. government has jurisdiction over the launch, operator, or reentry.\textsuperscript{124}

\textsuperscript{120} Id. § 70102. The SOT currently defines "controlling interest" as "ownership of an amount of equity in such entity sufficient to direct management of the entity or to void transactions entered into by management [with ownership of at least fifty-one percent of the equity[,] ... creat[ing] a rebuttable presumption that such interest is controlling." 14 C.F.R. § 401.5.

\textsuperscript{121} 49 U.S.C. § 70104(a).

\textsuperscript{122} See id.

\textsuperscript{123} Id. § 70104(a)(3).

\textsuperscript{124} Id. § 70104(a)(4).
The Act grants the SOT significant discretionary authority to waive spaceport license requirements or even the need to obtain a spaceport license.\textsuperscript{125} The SOT may exercise this authority if it “decides that the waiver is in the public interest and will not jeopardize the public health and safety, safety of property, and national security and foreign policy interests of the United States.”\textsuperscript{126}

a. Licensing Provisions: Private Exclusive Use Launch Sites

Normally, a license is required for an entity to operate a launch or reentry site. One notable exception to this rule involves private exclusive use launch sites. Licensed vehicle operators may conduct launches from a launch or reentry site exclusive to the licensed vehicle’s use without obtaining a separate launch site license.\textsuperscript{127} Essentially, the FAA is writing into the launch vehicle license operational parameters that allow the launching of the vehicle from an exclusive private site. Private exclusive use launch and reentry sites are still required to satisfy regulations governing safety and environmental issues.\textsuperscript{128} Also, although not licensed, private exclusive use launch sites are still launch sites for the purposes of the Act and Regulations.\textsuperscript{129}

b. Licensing Provisions: Modification, Transfer, Suspension, or Revocation

The SOT specifies the period for which a license issued or transferred is in effect.\textsuperscript{130} The Regulations state that launch site licenses are valid for five years from the date of issuance and

\textsuperscript{126} Id.
\textsuperscript{128} 65 Fed. Reg. at 56,648. “Safety and environmental issues associated with private use of a launch site by a launch or reentry licensee, as well as an RLV mission licensee, would be addressed as part of the license to operate the vehicle.” Id. See also 14 C.F.R. §§ 415.101, 417.9, 417.111, 417.403.
\textsuperscript{129} See 71 Fed. Reg. at 62,038 n.1. “Under current FAA policy, the FAA does not require Blue Origin to obtain a part 420 license for the operation of West Texas Launch Site. Nonetheless, although not licensed, West Texas Launch Site is still a launch site.” Id.
\textsuperscript{130} 49 U.S.C. § 70107.
The Regulations do not prescribe a specific period of validity for reentry licenses. Licenses may be issued or transferred in accordance with the Act and Regulations. Currently, only the FAA can transfer a license. Transfer applicants undergo an application process similar to licensees. Transfers are granted when applicants have satisfied the bases for the issuance of the launch/reentry site license to be transferred.

The FAA may modify licenses on application of a licensee or on its own initiative. Licenses are modified through either the issuance of a license order or written approval to the licensee that adds, removes, or modifies a license term or condition. Licensees are required to apply for modification if:

(1) the licensee proposes to operate the launch site in a manner that is not authorized by the license; or (2) the licensee proposes to operate the launch site in a manner that would make any representation contained in the license application that is material to public health and safety or safety of property, no longer accurate and complete.

FAA authority to suspend or revoke licensees is established under the Act. This authority may be exercised in three situations. First, the FAA may suspend or revoke a license if a “licensee has not complied substantially with a requirement of [the Act] or a regulation prescribed under [the Act].” Second, the FAA may suspend or revoke a license “to protect the public health and safety, the safety of property, or a national security or foreign policy interest of the United States.”

The last basis for suspension was established under the Commercial Space Launch Act Amendments of 2004 (“CLSAA-2004”). The CLSAA-2004 grants the SOT authority to:

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151 14 C.F.R. § 420.43.
152 Id. § 420.45(a).
153 Id. § 420.45(b). Transfer applicants submit an application in accordance with 14 C.F.R. § 413. Id.
154 The Regulations require transfer applicants, in accordance with 14 C.F.R. § 413, to satisfy the requirements of 14 C.F.R. §§ 420.15 and 420.17. Id.
155 49 U.S.C. § 70107(b). Note that the Act grants authority to the SOT, who has delegated that authority to the FAA Administrator. Id.
156 14 C.F.R. § 420.47(e).
157 Id. § 420.47(b).
159 Id. § 70107(c)(1).
160 Id. § 70107(c)(2).
suspend a license when a previous launch or reentry under the license has resulted in a serious or fatal injury (as defined in 49 CFR 830, as in effect on November 10, 2004) to crew or space flight participants and the Secretary has determined that continued operations under the license are likely to cause additional serious or fatal injury (as defined in 49 CFR 830, as in effect on November 10, 2004) to crew or space flight participants.\footnote{49 U.S.C. § 70107(d)(1) (Supp. 2004).}

What is interesting is that the language of the CLSAA-2004 does not explicitly limit the authority to suspend solely to launch vehicle operator licenses. Rather, the Act grants the SOT the authority to suspend "a license," without specifying a particular type.\footnote{See 49 U.S.C. §§ 70107(c)-(d) (2000 & Supp. 2004).} Therefore, the Act grants the SOT the authority to suspend any license granted under the Act, including launch or reentry site operator licenses. As a result, spaceport operators need to be advised that their operator license could be suspended if a launch or reentry vehicle utilizing their spaceport has an accident that results in a serious or fatal injury, even if the spaceport operators have complied substantially with the Act and Regulations and their spaceport operations are not a threat to the public health or safety, safety of property, national security, or foreign policy.

Unless the FAA specifies otherwise, modifications, suspensions, and revocations take effect immediately and remain in effect during administrative review.\footnote{Id. § 70107(d)(1).} The Act creates an exception to this general rule, mandating that suspensions based on "serious or fatal injury . . . to crew or space flight participants"\footnote{Id. § 70107(d)(2).} be as brief as possible and cease when "the licensee has taken sufficient steps to reduce the likelihood of a recurrence" or "has modified the license . . . to sufficiently reduce the likelihood of a recurrence."\footnote{See 49 U.S.C. § 70106 (2000 & Supp. 2004); 14 C.F.R. § 405.1 (2008).}  

3. Post-licensing Provisions: Enforcement and Penalty

Spaceport operators must allow federal officers or employees, or other individuals authorized under the FAA-AST, to observe any activity associated with the licensed operation of the spaceport.\footnote{49 U.S.C. § 70106 (2000 & Supp. 2004); 14 C.F.R. § 405.1 (2008).} This monitoring authority also extends to a spaceport operator's customers, contractors, or subcontractors, to the ex-
tent their activities are associated with the licensed operation of the spaceport.\textsuperscript{147}

The Act grants specific enforcement authorities that have been delegated to the FAA-AST. In carrying out the Act, the FAA-AST may conduct investigations and inquiries, administer oaths, take affidavits, and enter a spaceport to inspect an object to which the Act applies or a record or report required to be made or kept.\textsuperscript{148} The object, record, or report may be seized “when there is probable cause to believe the object, record, or report was used, is being used, or likely will be used in violation of [the Act].”\textsuperscript{149}

Spaceport operators should be advised that violating the Act, Regulations, or launch/reentry site license terms could result in civil penalties.\textsuperscript{150} Within the purview of the Act, violations may result in civil penalties of not more than $100,000 per violation.\textsuperscript{151} However, under the Act, “[a] separate violation occurs for each day the violation continues.”\textsuperscript{152} Therefore, it is important that spaceport operators monitor spaceport operations closely and hire competent legal counsel to ensure spaceport operations are in conformity with the Act, Regulations, and license terms. Spaceport operators should also be aware that other federal, state, or municipal laws applicable to spaceport operations could potentially impose civil and criminal penalties.


The FAA-AST has the authority to issue an order prohibiting, suspending, or ending spaceport operations without revoking the spaceport operator license if the FAA-AST decides that spaceport operations are “detrimental to the public health and safety, the safety of property, or a national security or foreign policy interest of the United States.”\textsuperscript{153} This order is “effective immediately and remains in effect during a review.”\textsuperscript{154}

\textsuperscript{147} See 49 U.S.C. § 70106; 14 C.F.R. § 405.1.
\textsuperscript{148} 49 U.S.C. § 70115(b).
\textsuperscript{149} Id.
\textsuperscript{151} Id.
\textsuperscript{152} Id.
\textsuperscript{153} Id. § 70108(a).
\textsuperscript{154} Id. § 70108(b).

The Act does not require spaceport operators (i.e., licensed launch or reentry site operators) to obtain liability insurance or demonstrate financial responsibility. Instead, Congress has mandated that vehicle licensees, not launch or reentry site licensees, obtain coverage to compensate for the maximum probable loss of claims by a third party or the U.S. government for death, injury, property damage, or loss resulting from an activity carried out under the vehicle operator license. This discrepancy is rational if one assumes that catastrophic injury or loss will most likely arise from vehicle operations and not spaceport operations. The problem with this assumption is that the nature of commercial space activities is changing, and these changes undermine the financial responsibility provisions contained in the Act.

Traditionally, commercial spaceports serve ELV customers that launch commercial or government payloads. Such activities pose little risk to third parties. Most likely, the primary risk traditional commercial spaceport operations pose to third parties is potential environmental damage resulting from ground, air, or water contamination. Government compensation is not an issue, because this provision is designed to protect government spaceport facilities and infrastructure from vehicle damage.

Today, some commercial spaceports are supporting non-traditional operations, such as HTOL RLVs and human space flight operations. These operations challenge the presumptions of the financial responsibility provisions, because potential third party liability and the possibility of catastrophic losses for spaceport operators increase once HTOL RLVs and human space flight participants are spaceport customers. For example, regularly scheduled RLV flights that traverse national airspace may require navigation and communication services from spaceport operators. Providing this service will expand the scope of potential third party liability for spaceport operators to parties injured as a result of negligent navigation and communication services rendered. Also, consider that spaceports will be open to space flight participants, crew, or the general public, all of which may be injured on site, hence increasing the universe of potential

155 Id. § 70112(a).
156 Id.
157 See id. § 70112.
third party liability. Further, consider that airports in major cities may convert to aerospace ports supporting HTOL RLVs in order to serve the needs of major U.S. metropolitan markets. In this event, spaceport operations will no longer be in remote locations, but rather in major population centers, resulting in an increased risk of third party and catastrophic losses.

Whether or not spaceport operators should be required to maintain liability insurance or demonstrate financial responsibility is a policy decision. When the commercial spaceport and space transportation industry develops more fully, this may be an issue of importance. Arguments in favor of mandatory liability insurance or financial responsibility include the positions that such a mandate assures compensation for innocent third parties, assures reimbursement to the United States in the event of liability established under *corpus juris spatialis*, and provides equitable treatment for vehicle and site licensees. Arguments against mandatory liability insurance or financial responsibility include the positions that spaceport operators should have the freedom to assume risk and decide whether or not to obtain insurance, that mandatory insurance is not necessary given the limited risk spaceport operations incur, and that the issue should be decided by state governments and not the federal government.

5. Secretary of Transportation Regulatory Authority

The SOT has general authority to carry out the Act, 158 and shall issue regulations to carry out the Act. 159 The SOT is given a broad grant of regulatory authority as is "necessary to protect the public health and safety, safety of property, national security interests, and foreign policy interests of the United States." 160 To that end, the SOT may prescribe regulations necessary to ensure compliance with the Act, including on-site verification. 161 The SOT is obligated to promulgate regulations within certain periods of time and to "establish procedures . . . that expedite review of [spaceport license applications] and reduce the regulatory burden for an applicant." 162

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The Act has granted the SOT specific regulatory authority to license the operation of spaceports. The SOT is authorized to regulate spaceport license application procedure in the form and way it prescribes. As a general rule, all requirements of the laws of the United States are applicable to the operation of a spaceport and are requirements for obtaining a license. The SOT may prescribe by regulation that a requirement of a law of the United States not be a requirement for a license. This is not to say that the law will not apply to the operation of a spaceport. Rather, the Act grants discretion to the SOT with regards to licensing spaceport operations.

6. Other Provisions

The Act also contains provisions regarding interagency consultation, space advertising, preemption of scheduled launches/reentries, acquisition of federal property and services, experimental suborbital rocket permits, human space flight related provisions, administrative hearings/review, and the relationship of the Act to other executive agencies, laws, and international obligations. Several of these provisions are directly relevant to spaceport operations.

a. Space Advertising

Advertising is an alternative method for spaceport operators to generate revenue. Spaceports that serve human SFPs may be in a particularly strong position to generate advertising revenues. Spaceport operators and advertisers should be able to market products to SFPs during their training, orientation, space flight, and post-flight activities. Given the cost of human space flight, SFPs will mostly be wealthy persons, a definite advantage when marketing advertising for high-end products and services. In addition, spaceports serving SFPs may have a substantial amount of visitors to view spaceflight launches or to inquire about spaceport and spaceflight operations. These non-

164 Id.
165 Id. § 70105(b)(1).
166 Id. § 70105(b)(2)(C). In order for the SOT to rule that a requirement of a law of the United States not be a requirement for a license, the SOT must consult "with the head of the appropriate executive agency [and decide] that the requirement is not necessary to protect the health and safety, safety of property, and national security and foreign policy interests of the United States." Id.
167 Id. §§ 70105(a), 70109–70111, 70116–70117.
SFP persons may also be potential audiences for spaceport advertising.

In 1993, Space Marketing Inc., a U.S. corporation, proposed to orbit a one-mile wide display satellite at an altitude of 180 miles that would be "legible to the naked eye." A public uproar ensued, and Congress passed a provision of the Act prohibiting licensees from launching payloads to be used for "obtrusive space advertising." "Obtrusive space advertising" is defined by the Act as "advertising in outer space that is capable of being recognized by a human being on the surface of the Earth without the aid of a telescope or other technological device." As a result, advertising in outer space has been limited to non-obtrusive advertising such as corporate sponsorship logos and product placement. Spaceport operators should be aware of this provision and should not support vehicle launches that will violate this provision.

The Act specifically allows non-obtrusive space advertising, including advertising on spaceport launch and support facilities. A careful reading of this provision reveals that obtrusive terrestrial advertising is not prohibited. As a result, terrestrial spaceports can advertise obtrusively on site, so long as their advertising does not violate any other federal, state, or local laws.

b. Acquisition of U.S. Government Property and Services

Purchasing launch or reentry property from the United States may be a cost-efficient procurement method for commercial spaceports developing or expanding launch, reentry, and support facilities. The Act provides for private sector and state government acquisition of excess U.S. government launch or reentry property. Property can be acquired by sale or transaction at fair market value. The price for property not acquired by sale or transaction "is an amount equal to the direct costs,
including specific wear and tear and property damage, the [g]overnment incurred because of acquisition of the property."\textsuperscript{175}

c. Administrative Hearings and Judicial Review

The SOT is obligated to provide a hearing to spaceport license applicants "for a decision [by the SOT] to issue or transfer a license with terms or deny the issuance or transfer of a license."\textsuperscript{176} In addition, for any modification, suspension, or revocation of a spaceport license, as well as the prohibition, suspension, or end of spaceport operations, the SOT must provide a hearing.\textsuperscript{177} A final action by the SOT under the Act is subject to judicial review.\textsuperscript{178}

d. Relationship to Other Executive Agencies and Laws

In addition to the Act, commercial spaceports are subject to a range of federal laws. The Federal Communication Commission, Department of State, Environmental Protection Agency, Department of Defense, National Aeronautics and Space Administration, and other federal agencies all have been delegated regulatory authority over some aspect of commercial space activity. The FAA-AST has been deemed the coordinator for licensing commercial space activities, effectively communicating and coordinating on behalf of the license applicant, subject to the provisions of the Act. Except as provided for in the Act, a person is not required to obtain a license to operate a spaceport from an executive agency.\textsuperscript{179} In theory, this should result in lower licensing costs and improved licensing efficiency for the commercial spaceport industry.

States or political subdivisions of a state may adopt or have in effect laws, regulations, standards, or orders that are in addition to or more stringent than a requirement of the Act or Regulations, so long as the state or local law and regulations are not inconsistent with the Act.\textsuperscript{180}

\textsuperscript{175} Id. § 70111(b)(2)(B).
\textsuperscript{178} Id. § 70110(b).
\textsuperscript{179} Id. § 70117(a).
\textsuperscript{180} Id. §§ 70117(c)(1)-(2).
B. Commercial Space Transportation Regulations

The FAA-AST has promulgated regulations in accordance with authority delegated by the SOT established under the Act. The Regulations are listed as Commercial Space Transportation Regulations in Title 14 of the Code of Federal Regulations, §§ 400-1169. The Regulations are divided into three sub-chapters:

(1) Subchapter A – General,
(2) Subchapter B – Procedure,
(3) Subchapter C – Licensing.

Legal counsel for commercial spaceport operators have to pay special attention to the regulations governing license application procedure, criteria and information requirements for obtaining a license, license terms and conditions, responsibilities of licensees, and investigation and enforcement.

1. Spaceport Licensing Process

The primary regulatory function of the FAA-AST is to license commercial space activities. To that end, this section will examine the spaceport licensing process established by the Regulations.

The spaceport licensing process is outlined in Diagram 1.

Diagram 1

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181 This chart was created by the author, Michael C. Mineiro, on March 23, 2008.
a. Pre-Application Consultation

Applicants are required to consult with the FAA-AST before submitting an application. During this consultation, the FAA-AST discusses the application process, identifies possible regulatory issues and issues relevant to the FAA's licensing decision, and helps the applicant make any changes to the proposed application in an effort to prevent significant delay or costs to the applicant.

b. Policy Review and Approval

The FAA-AST conducts an interagency review of a license application to assess whether it presents any issues affecting national security, foreign policy interests, or international obligations of the United States. For the policy review, applicants must submit information on the proposed launch site operator, launch site, foreign ownership interests, and launch site operations.

c. Safety Review and Approval

The Regulations impose different safety review requirements for launch site and reentry site applicants. The safety review for launch site licenses is much more detailed and stringent than for reentry sites. Spaceports must be separately licensed to support both launch and reentry operations.

Launch site applicants must pass a safety review of the proposed launch site location and launch site operations. To gain approval for a launch site location, an applicant must demonstrate that for each launch point proposed for the launch site, at least one ELV or RLV can be flown from the launch point safely. If the applicant proposes more than one type of vehicle flown from a launch point, the applicant must demonstrate that every proposed vehicle can be flown safely from that launch point. Also, the applicant must demonstrate that the heaviest weight class planned to be flown from the launch point can be

183 Id.
185 14 C.F.R. § 420.15.
186 Id. § 420.19(a).
187 Id. § 420.19(b).
flown safely. Proposed launch site operations that are reviewed include control of public access, scheduling of site operations, notifications, FAA Air Traffic Controller ("ATC") and Coast Guard coordination agreements, accident investigation plans, record keeping, handling of hazardous materials/explosives, handling of propellants, and lightning protection.

The main safety requirement for a reentry site is that the site "support reentry of [vehicles] for which the three-sigma footprint of the vehicle upon reentry is wholly contained within the site." The FAA-AST reserves the right to issue a reentry site license on a determination that operation of the site does not jeopardize public health or safety. The FAA will most likely exercise this reserved authority in more regulatory detail when reentry sites begin servicing the next-generation RLVs, such as Single Stage Take-Off and Landing ("SSTL") and HTOL vehicles.

d. Environmental Review

The National Environmental Policy Act ("NEPA") requires the FAA to issue a detailed statement for every major federal action significantly affecting the quality of the human environment. The decision to license commercial spaceports is a major federal action under NEPA, and the FAA-AST is responsible for analyzing the environmental impacts of the proposed spaceport and complying with NEPA requirements. Applicants must provide information as requested by the FAA-AST for an analysis of the environmental impact associated with the proposed spaceport.

FAA Order 1050.1E implements FAA policy and procedures for compliance with NEPA. "NEPA analysis can be accomplished through various forms of environmental documentation depending on the size and type of proposed action. Such documentation can be a Categorical Exclusion (CATEX), an Envi-

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188 Id. § 420.19(c).
189 Id. §§ 420.51–420.71.
190 Id. § 433.5.
191 Id. § 433.3.
193 14 C.F.R. §§ 415.201, 433.7. See also 40 C.F.R. § 1508.18 (2007).
194 14 C.F.R. §§ 415.201, 433.7. See also 40 C.F.R. § 1508.18.
ronmental Assessment (EA), or an Environmental Impact Statement (EIS).”

e. Compliance Monitoring

The FAA monitors licensees to ensure compliance with the Act, Regulations, and license terms and conditions. To that end, spaceport operators must allow federal officers, employees, or other individuals authorized by the FAA-AST to observe any activity associated with the licensed operation of the spaceport. In the event of non-compliance, the FAA-AST has the authority to suspend or revoke licenses, issue emergency orders, and impose civil penalties.

C. U.S. NATIONAL SPACE AND SPACE TRANSPORTATION POLICY

National Space Policy and Space Transportation Directives are executive policy instruments “understood as a statement of goals or objectives which a President sets and pursues. Whether these directives have the force of law [is a matter of legal debate and] depends upon such factors as the President’s authority to issue them, their conflict with constitutional or statutory provisions, and their promulgation in accordance with prescribed procedure.” This article does not examine the legality of presidential directives. Instead, the directives are examined as statements of policy that are meant to be implemented by the Executive branch in accordance with the law. To that end, these directives provide context for the implementation of law and regulations governing commercial spaceport activities.


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199 14 C.F.R. § 405.5.


the conduct of U.S. space activities." While the National Directive covers a variety of space-related activities, our interest lies in the Commercial Space Guidelines. The Commercial Space Guidelines require Executive departments and agencies to "[m]aintain a timely and responsive regulatory environment for licensing commercial spaceports," as well as to "[e]nsure that United States Government space activities, technology, and infrastructure are made available for private use on a reimbursable, non-interference basis to the maximum practical extent, consistent with national security."

These guidelines have two practical impacts. First, the FAA-AST is compelled to process commercial spaceport licenses in a timely manner. This is important for commercial spaceport operators, because FAA-AST licensing activities impose both direct and indirect costs on commercial operators. Second, federal ranges are made available for private use, resulting in commercial spaceports co-locating on federal ranges.

The U.S. Space Transportation Policy Directive ("Transportation Directive") establishes "national policy, guidelines, and implementation actions for [U.S.] space transportation programs and activities to ensure the Nation's ability to maintain access to and use space for U.S. national and homeland security, and civil, scientific, and commercial purposes." The Transportation Directive contains three provisions of special importance to commercial spaceport activities.

First, the Transportation Directive elucidates that access to federal space launch bases and ranges, as well as other government facilities and services, is to be provided for commercial purposes on a stable, predictable, and direct-cost basis (as defined in 49 U.S.C. § 70101). As a result, commercial spaceports co-lo-
cated on federal ranges, as well as launch and service providers, receive the benefit of federal space infrastructure and personnel on an at-cost basis. Second, "private sector and state and local government investment and participation in the development and improvement of space infrastructure," including non-federal spaceports, are encouraged.\textsuperscript{208} Given the relative strength of the federal government, as compared to state and local governments, simply implementing a policy of encouragement instead of dissuasion supports state and local participation. As is discussed later in this article, state and local governments are participating significantly in the development and improvement of non-federal spaceports, in part because of Congressional legislation and Executive policy.\textsuperscript{209} Third, commercially available U.S. space transportation products and services are to be purchased "to the maximum extent possible, consistent with mission requirements and applicable law."\textsuperscript{210} If spaceports and the services they provide are considered products and services, this provision appears to mandate that U.S. government departments and agencies use commercial spaceports, instead of federal spaceports, when consistent with mission requirements and applicable law, including national security. In practice, it is not clear whether the government is utilizing commercial spaceports to the maximum extent possible. While the policy is in favor of government purchasing commercial spaceport products and services if the commercial spaceport offers services and mission parameters comparable to federal spaceports, most non-federal commercial spaceports cannot offer comparable service and mission parameters.\textsuperscript{211} The commercial spaceport industry needs to further develop before this policy provision can fully take effect.

V. STATE LAW: COMMERCIAL SPACEPORT INITIATIVES

Several states have enacted or are proposing legislation that fosters the development of commercial spaceports. This type of legislation is known as spaceport initiatives. The ultimate goal of these initiatives "is to generate state economic growth and . . .

\textsuperscript{208} \textit{Id.}
\textsuperscript{209} See infra Part V.
\textsuperscript{210} Office of Sci. \& Tech. Policy, U.S. Space Transportation Policy, supra note 206, at 6.
improve a state’s revenue base.” \(^{212}\) The Act does not prohibit this legislation, so long as the spaceport initiatives are not inconsistent with the Act. \(^{213}\)

California, Florida, New Mexico, Oklahoma, Texas, and Virginia have enacted legally binding spaceport initiatives. In addition, during the 2008 legislative session, the Hawaii legislature proposed an initiative to fund the costs associated with applying for a commercial space transportation license with the FAA-AST. \(^{214}\) Each state’s initiative is unique and contains various provisions designed to create, improve, and promote commercial spaceport infrastructure development and use. Sometimes these initiatives are passed as a series of laws over a period of months or even years.

While each state’s initiatives are unique, there are common strategies that the states have pursued in their spaceport initiatives. These include the establishment of spaceport authorities, \(^{215}\) tax incentives, \(^{216}\) state and local taxing and bonding authorization, \(^{217}\) military spaceport infrastructure conversion, \(^{218}\) trust funds, \(^{219}\) liability immunity, \(^{220}\) and spaceport infrastructure development. \(^{221}\) Legal counsel for spaceport operators and service providers should be aware of these initiatives and advise their clients on the comparative advantages and disadvantages each state provides.

VI. LIABILITY

Commercial spaceport operators should pay careful attention to take appropriate steps to mitigate potential liability. Liability for spaceport operators may be established under a variety of legal mechanisms, such as federal and state contract law, common law, or statutory law. The Act contains two provisions relevant to commercial spaceport operator liability: the reciprocal

\(^{212}\) Id.
\(^{217}\) See, e.g., H.R. 473, 47th Leg., 2d Sess. (N.M. 2006).
\(^{219}\) See, e.g., Tex. Gov’t Code Ann. § 481.0069 (Vernon 2004).
\(^{221}\) See, e.g., H.R. 835, 47th Leg., 2d Sess. (N.M. 2006).
cross-waiver\textsuperscript{222} and indemnification provisions.\textsuperscript{223} As part of their commercial spaceport initiatives, states are also enacting legislation granting conditional liability immunity to commercial space entities supporting human space flight. The State of Virginia recently adopted such legislation.\textsuperscript{224}

A. Reciprocal Waiver of Claims

The Act contains two provisions mandating reciprocal waivers of claims. The first provision applies to launch or reentry licensees.\textsuperscript{225} The second provision applies to the U.S. government.\textsuperscript{226}

The first provision requires:

A launch or reentry license issued or transferred [to] contain a provision requiring the licensee or transferee to make a reciprocal waiver of claims with its contractors, subcontractors, and customers, and contractors and subcontractors of the customers involved in launch services or reentry services under which each party to the waiver agrees to be responsible for property damage or loss it sustains, or for personal injury to, death of, or property damage or loss sustained by its own employees resulting from an activity carried out under the applicable license.\textsuperscript{227}

As licensed launch and reentry site operators, this provision does not directly apply to spaceport operators. Instead, spaceport operators are subject to this provision as contractors, subcontractors, or customers of the licensee. Unless a commercial spaceport can structure its contractual relationship with launch service providers, launch vehicle operators, and launch vehicle customers to exclude the spaceport operators as a contractor or subcontractor, this mandatory cross-waiver provision applies.\textsuperscript{228} The practical result is that spaceport operators are limited in their capacity to sue for damages as a result of vehicle launches supported by their spaceport.\textsuperscript{229} It is therefore crucial that spaceports properly insure themselves against potential damages arising from launch and reentry services.

\textsuperscript{223} Id. § 70113(a).
\textsuperscript{224} See VA. CODE ANN. § 8.01–227.9.
\textsuperscript{228} Id.
\textsuperscript{229} See id.
The second provision applies when executive agencies of the U.S. government are involved in launch or reentry services. The SOT is required to make a reciprocal waiver of claims for executive agencies of the Government involved in launch services or reentry services, and contractors and subcontractors involved in launch services or reentry services...with the licensee or transferee, contractors, subcontractors, [crew, space flight participants,] and customers of the licensee or transferee, and contractors and subcontractors of the customers, involved in launch services or reentry services.

Under this waiver, each party "agrees to be responsible for property damage or loss it sustains, or for personal injury to, death of, or property damage or loss sustained by its own employees resulting from an activity carried out under the applicable license." Spaceports will be subject to this provision when contracting with the government for launch or reentry services. This provision is of special importance to spaceports co-located on federal ranges that have contracted to use federal launch facilities for commercial purposes.

Government agency waivers contain a condition that limits the application of waivers "only to the extent that claims are more than the amount of insurance or...financial responsibility required" under the Act. This condition is favorable to the government, because, in practice, it requires parties to the waiver to provide insurance or financial responsibility coverage to protect government property. However, this condition is emasculated when applied to commercial spaceport operators who are parties to the waiver, because spaceport operators are not required to obtain insurance or demonstrate financial responsibility. The result is that government agency waivers apply to the full extent of claims involving launch and reentry site licensees.

231 Id.
232 Id.
233 Id.
234 See 49 U.S.C. § 70112(a) (2000). The Act does not require spaceport operators (i.e., licensed launch site or reentry site operators) to obtain liability insurance or to demonstrate financial responsibility. Congress has mandated that vehicle licensees, not launch or reentry site licensees, obtain coverage to compensate for the maximum probable loss of claims by a third party or the U.S. government for death, injury, property damage, or loss resulting from an activity carried out under the vehicle operator license. Id.
Waivers are only applicable to parties involved in launch and reentry services. The Act defines "launch services" as "activities involved in the preparation of a launch vehicle and payload for launch."235 "Reentry services" are defined as "activities involved in the preparation of a reentry vehicle and its payload, if any, for reentry."236 While these definitions provide some clarity, they are written broadly and could encompass a wide range of activities. This ambiguity creates the possibility of extending the application of cross-waivers and potential liability to a wide range of service providers. For example, it is unclear whether navigation and communication services, involving the launch or reentry of a vehicle, are "launch services" as defined in the Act. If an RLV carrying human SFPs is receiving navigation and communication services from a commercial spaceport operator, is this spaceport subject to the Act's reciprocal cross-waiver provisions? Likewise, if the government is providing navigation and communication services to the RLV, is the government subject to the cross-waiver provisions? This last scenario is especially troubling, because, in all likelihood, the government will be providing some sort of navigation and communication service to RLVs that traverses national air space. In the United States, the government is subject to suit under the Federal Torts Claims Act ("FTCA") on claims of negligence when providing ATC services, and it is unclear what legal effect reciprocal cross-waivers will have in suits brought by plaintiffs under the FTCA who are parties to the waivers.237

B. INDEMNIFICATION

The Act provides for conditional indemnification from claims against licensed spaceport operators resulting from an activity carried out under the spaceport's launch or reentry license for death, bodily injury, or property damage or loss.238 This indemnification applies to successful claims by third parties against licensed spaceport operators, their contractors, subcontractors, or customers, or contractors or subcontractors of a customer, but not against SFPs.239 Indemnification is conditional on Con-

236 Id. § 70102(14).
239 Id.
gressional appropriation to pay the claims.\textsuperscript{240} No indemnification is provided for claims resulting from the willful misconduct of the licensee.\textsuperscript{241}

Launch and reentry site license applicants are not required to obtain insurance or demonstrate financial responsibility under the Act.\textsuperscript{242} Nonetheless, either by choice or oversight, the language of the Act provides for indemnification from a successful claim against a licensee.\textsuperscript{243} The term a licensee does not appear to exclude launch or reentry site licensees. Therefore, while the Act does not require insurance or a demonstration of financial responsibility for launch or reentry site operators, it still provides conditional indemnification. The result is especially odd given the fact that claims are indemnified only to the extent the total amount of the successful claim is more than the amount of insurance or demonstrated financial responsibility required under the Act, but is not more than $1,500,000,000 (adjusted for inflation from January 1, 1989).\textsuperscript{244} The result is that spaceports are conditionally indemnified for any amount up to $1,500,000,000 (adjusted for inflation) for claims arising out of a launch or reentry they supported.

C. VIRGINIA SPACEFLIGHT LIABILITY AND IMMUNITY ACT

As a sign of what may be a new trend in state commercial spaceport initiatives, in 2007 Virginia enacted the Spaceflight Liability and Immunity Act ("Spaceflight Act"), a law limiting the liability of entities engaged in commercial spaceflight activity.\textsuperscript{245} The Spaceflight Act applies to all FAA-AST licensed entities, including spaceport operators, and shields them from liability arising out of human space flight activities.\textsuperscript{246} Specifically, the Spaceflight Act prohibits human SFPs, their representatives, heirs, administrators, executors, assignees, next of kin, estate, or

\textsuperscript{240} Id.
\textsuperscript{241} Id. § 70113(a)(2).
\textsuperscript{242} 49 U.S.C. § 70112(a) (2000). The Act does not require spaceport operators (i.e., licensed launch site or reentry site operators) to obtain liability insurance or to demonstrate financial responsibility. Congress has mandated that vehicle licensees, not launch or reentry site licensees, obtain coverage to compensate for the maximum probable loss of claims by a third party or the U.S. government for death, injury, property damage, or loss resulting from an activity carried out under the vehicle operator license. Id.
\textsuperscript{244} Id. §§ 70113(a)(1)(A)–(B).
\textsuperscript{245} Va. Code Ann. §§ 8.01-227.8, 8.01-227.9, 8.01-227.10 (West 2007).
\textsuperscript{246} Id. § 8.01–227.9(A).
any other person bringing a claim on behalf of the SFP, from maintaining an action for recovery from licensed entities for injury resulting from spaceflight activities. Entities may not avail themselves of this immunity if they "commit[ ] an act or omission that constitutes gross negligence evidencing willful or wanton disregard for the safety of the [SFP], and that act or omission proximately cause[d an SFP] injury," or the entity intentionally causes an SFP injury.

This immunity is conditioned on the SFP being informed of the risk of spaceflight activities, as required under federal law, the Act, and the Regulations. The requirement to inform a SFP of risk is the codification of the "common law principles associated with the ‘duty to warn’ in adventure sports." A challenge for spaceport and spaceflight operators will be determining what should be explained to a SFP in order to fulfill their legal duties under statute and common law. The Spaceflight Act provides some guidance, giving an example "warning statement" that at a minimum (and in addition to any language required by federal law) would fulfill the Spaceflight Act’s requirement of informing SFPs of spaceflight risks.

D. LIMITING POTENTIAL LIABILITY

There are several practical steps spaceport operators can take to minimize exposure to potential liability arising from spaceport operations:

(1) Identification: Spaceport operators should identify potential sources of liability based on assessment of operations, either planned or currently underway.

(2) Design: Spaceports should be designed to minimize potential health, environmental, property, and safety hazards. Spaceport design should consider hazards to persons and property, both on and off site.

(3) Operations: Spaceport operations should include hazard prevention and emergency response. A division of spaceport operations should be dedicated to this task and focus on vehicle launch operations, emergency re-

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247 Id.
248 Id. §§ 8.01–227.9(B)(1)–(2).
249 Id. § 8.01–227.9(A).
251 Id.
252 VA. CODE ANN. § 8.01-227.10.
sponse, handling and storage of propellants and hazardous materials, environmental monitoring, site security, employee safety, human space flight participant safety, and visitor safety.

(4) Terrorism/Criminal Activity: Spaceport operators should work with federal, state, and local authorities to prevent and respond to terrorist or criminal activity aimed at disrupting spaceport operations.

(5) Insurance: Spaceport operators should acquire insurance sufficient to mitigate potential liability arising from spaceport operations.

(6) Jurisdiction: Spaceports should be sited in legal jurisdictions with favorable laws. Particular focus should be given to laws governing liability, freedom to contract, liability caps, and liability immunities. Spaceports serving SFPs should select a jurisdiction that supports the enforceability of assumptions of risk, waivers of liability, and indemnification agreements.

(7) Contracts: The Act’s reciprocal cross-waiver provisions do not apply directly to site operators, and therefore allow for some freedom of contracting for risk and liability. Spaceport operators should maximize contracting provisions that shift risk to other parties, including spaceport facility and product manufacturers, customers, and visitors. Federal and state laws may restrict or prohibit the enforcement of contract provisions and should be duly regarded.

(8) Cross-waivers: In *Martin Marietta Corp. v. International Telecommunication Satellite Organization* (*INTELSAT*), the court held that while the Act requires licensees to include reciprocal cross-waivers in their contracts, nothing in the Act suggests “that cross-waivers will be imputed into contractual agreements which do not contain express cross-waiver provisions.” As a result, if spaceport operators supporting vehicle licensees want to avail themselves of cross-waivers as mandated in the Act, they must ensure that cross-waiver provisions are included in the contract.

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254 See id.
VII. INTERNATIONAL SPACEPORTS

In the near future, spaceports may be servicing RLV launches and reentries that originate or depart from outside the United States or its sovereign territories. These spaceports should be designated as international spaceports and regulated to service international passengers and cargo. Once spaceports service international launches and reentries, they will be ports of entry and exit. As a result, the U.S. Customs and Border Protection Agency will need to operate at spaceports in a fashion similar to how they operate at airports. Import and export controls, immigration, customs, and all related operations will be needed to service RLV passengers and cargo.

A. ARRIVALS FROM OUTER SPACE

While at first glance the implementation of law and regulations governing international passengers whose flight traverses outer space seems to be a relatively straightforward task, upon closer inspection several challenges become visible. First, what will be the legal standard for establishing whether or not a passenger has entered or exited the United States? Second, what is the legal effect of boarding onto a space vehicle from a space object or disembarking onto a space object? Third, if passengers depart the vehicle, either into outer space or onto a space object, what steps should be taken to ensure that biological contamination of either the space environment or Earth environment does not occur? Fourth, what is the appropriate choice of law and jurisdiction applicable to the vehicle and its passengers at different stages of flight (i.e., what law applies, where, and when)?

To place this within practical context, let us look at five possible scenarios under which passengers aboard RLVs will arrive from outer space at a U.S. spaceport.

(1) U.S. Space Flight: The launch originated from the United States, the vehicle took the passengers into outer space, never allowed the passengers to exit or disembark, and returned the passengers to the United States.


256 See id.
(2) U.S. Space Flight with Vehicle Exit: The launch originated in the United States, the vehicle took the passengers into outer space, the passengers exited the vehicle temporarily, either onto a space object (that may or may not be on the U.S. registry of space objects), into outer space, or onto a celestial body, and then returned and disembarked at a U.S. spaceport.

(3) Non-U.S. Flight: The launch originated outside the United States, the vehicle took the passengers to outer space, the passengers did not exit the space vehicle, and the vehicle returned and disembarked the passengers at a U.S. spaceport.

(4) Non-U.S. Flight with Vehicle Exit: The launch originated outside the United States, took the passengers to outer space, allowed them to exit the vehicle temporarily, either onto a space object (that may or may not be on the U.S. registry of space objects), into outer space, or onto a celestial body, and returned and disembarked the passengers at a U.S. spaceport.

(5) Outer Space Flight: The launch originated in outer space, boarding up the passengers in outer space, on a celestial body, or on an outer space object (that may or may not be on the U.S. registry), and disembarked the passengers at a U.S. spaceport.

In all of these scenarios, the applications of the four questions raised previously are illustrated. In Scenario (1), the question arises as to whether the traversing into outer space is sufficient to exit the United States. In Scenario (2), the question of whether or not the passenger has exited the United States is more complex because of a temporary visit to an orbiting space station. Scenario (3) raises similar questions as those in Scenario (1), with the added caveat of how to treat non-U.S. RLV departures. Scenario (4) raises several interesting issues of timing, such as whether the space object is the point of origin for the passenger. Scenario (5) raises the most complex questions, involving long-term habitants of celestial bodies or space objects and how their nationality and territorial status is to be defined. All of these scenarios raise several important legal and practical questions that will have to be dealt with once RLV human space flights enter service.
B. Operating a Spaceport Outside of the United States

Individual citizens of the United States, entities organized or existing under the laws of the United States, and states of the United States must obtain licenses from the FAA-AST to operate spaceports outside of the United States. This rule applies whether or not the proposed spaceport is in a foreign country, global common, on the high seas, or in outer space. Spaceports operating in foreign countries will also be subject to the laws of that foreign jurisdiction. Therefore, legal counsel for foreign-operated spaceports must ensure spaceport operations are in accordance with the laws and regulations of the foreign country.

If the controlling interest in any foreign corporation, partnership, joint venture, association, or other foreign entity is held by a citizen of the United States or a U.S. entity, that entity must obtain a license to operate a spaceport from the FAA-AST, even when the spaceport is not in the United States. "Controlling interest" is defined as the "ownership of an amount of equity ... sufficient to direct management of the entity or to void transactions entered into by management. Ownership of at least fifty-one percent of the equity in an entity ... creates a rebuttable presumption that such interest is controlling." This rule applies to spaceports in the territory of a foreign country only if there is an agreement between the United States and the foreign government which gives the United States jurisdiction over the operation. This rule always applies to spaceports located neither in the territory of a foreign country nor in the territory of the United States, unless the United States has an agreement with the foreign government, providing that the foreign government has jurisdiction over the spaceport. This provision is designed to cover spaceport operations such as Sea Launch, undertaken via a mobile, floating platform located on the high seas.

258 Id. § 70104(a)(3).
261 Id. § 70104(a)(3).
U.S. COMMERCIAL SPACEPORTS

VIII. RECOMMENDATIONS TO LAW AND POLICY MAKERS

U.S. law governing commercial spaceports needs to be revised to better facilitate commercial spaceport operations. To its credit, U.S. law does support the licensing and regulation of spaceport operations. Nonetheless, deficiencies exist within the current legal framework that impede the development of commercial spaceports. The following is a list of legal challenges facing the commercial spaceport industry. Each identified challenge is accompanied by a recommended solution.

(1) **Challenge:** The law governing liability and contracts is subject to state common and statutory law, leaving spaceport operators subject to a plethora of possible legal standards dependent on the location of an accident.

**Recommendation:** Congress, under the authority of the Commerce Clause provision,\textsuperscript{263} should pass legislation that supersedes state liability laws, creating a predictable liability regime for the commercial space industry. The legislation should establish standards for assumption of risks and waivers of liability. Furthermore, statutory limits could be placed on third party liability, absent intentional misconduct. As an alternative, these goals could be achieved through the creation of a uniform code subject to state-by-state adoption.

(2) **Challenge:** Cross-waiver provisions limit the capacity of spaceport operators to shift risk of loss to launch or re-entry licensees.

**Recommendation:** Amend the Act to allow spaceport operators to contract with launch or reentry licensees without mandating reciprocal cross-waivers.

(3) **Challenge:** The Commercial Space Launch Amendments Act of 2004, while an appropriate step in the regulation of commercial human space flight, did not examine the role of spaceports servicing commercial human space flight.

**Recommendation:** Congress should hold hearings on spaceports and commercial human space flight to determine what steps should be taken to better facilitate

\textsuperscript{263} U.S. Const. art. 1, § 8, cl. 3.
commercial human space flight and commercial spaceport operations.

(4) **Challenge:** Commercial spaceports may have a difficult time obtaining financing or liability insurance at economically feasible rates.

**Recommendation:** The federal government could establish a federally-backed loan and insurance program. Loans provided to commercial spaceports could be insured by the federal government. Liability insurance could be provided to spaceport operators at a federally subsidized rate if the liability insurance market is not able to provide insurance at economically feasible rates (as defined by Congress).

(5) **Challenge:** Spaceports servicing international launches and reentries of reusable launch vehicles with human space flight participants or cargo on board are ports of entry to the United States and need to be regulated as such.

**Recommendation:** Congress and the Executive should take the appropriate steps for the Customs and Border Control Agency to support international spaceport operations.

(6) **Challenge:** Spaceports may be an attractive target for sabotage or terrorist attacks.

**Recommendation:** Spaceports should receive federal funding and support to protect against sabotage and terrorist contingencies.

To be certain, this list is not exhaustive of the legal and practical challenges facing the commercial spaceport industry. Congress needs to take the necessary steps to identify and resolve legal and political challenges inhibiting the growth of commercial spaceports. Not addressing these challenges and allowing commercial spaceports to falter would undermine the economic and national security of the United States. Alternatively, resolving these challenges and supporting commercial spaceport development at this nascent stage will position the United States as a world leader in commercial space transportation infrastructure, capable of attracting entrepreneurship, capital, technology, and human resources.
IX. CONCLUSION

It is my hope that this article has shed some light on the law governing U.S. commercial spaceports. Spaceport operators, law and policy makers, legal counsel, state and local governments engaged in commercial spaceport initiatives, and even customers of spaceports can all benefit from understanding the law governing spaceport activities.

The full body of law governing commercial spaceport activities is not limited to the areas discussed in this article. Contracts, financing, insurance, transportation, telecommunication, ITARS, and a variety of other laws impact spaceport operations. What is unique about the application of these other laws is that they must be placed within the context of corpus juris spatialis, the Act, and the Regulations that this article examined. While no attorney can master the diversity of law that may apply to spaceport operations, with a strong foundation in the corpus juris spatialis, the Act, and the Regulations, counsel should be well prepared to serve the interests of his or her client.

In many ways the Act and the Regulations have served the commercial spaceport industry well. The Act and the Regulations provide a legal structure for commercial operations, are mandated to reduce the regulatory burden on license applicants, and achieve stated policy goals. Despite this success, the law needs to evolve to meet new technologies, such as HTOL-SSTO RLVs, and new markets, such as commercial human space flight.

Congress needs to take the necessary steps to identify and resolve legal and political challenges inhibiting the growth of commercial spaceports. Not addressing these challenges and allowing commercial spaceports to falter would undermine the economic and national security of the United States. Alternatively, resolving these challenges and supporting commercial spaceport development at this nascent stage will position the United States as a world leader in commercial space transportation infrastructure, capable of attracting entrepreneurship, capital, technology, and human resources.

One can imagine a future not so far away where spaceports are centers of great economic activity, supporting passenger flights around the world, into orbit, or to celestial bodies. Mankind is reaching out to the stars, and spaceports are where our first steps are being taken. By fostering the development of commercial spaceports today, we build a road to tomorrow.