

**Testimony of Caryn Schenewerk¹
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**Before the Committee on Commerce, Science, & Transportation
Subcommittee on Space and Science
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Chair Sinema, Ranking Member Schmitt, and distinguished members of the Committee: thank you for inviting me to share my perspective on the U.S. commercial space industry, particularly the importance of effective, streamlined regulations that promote safety, innovation and competitiveness.

The U.S. commercial space industry is rapidly innovating and on a growth trajectory relative to the world-wide space market.² The commercial space market includes international and domestic space services, which are dominated by in-space activities, namely satellite-based services and their supporting ground systems.³ The U.S. segment of that market is growing as is the U.S. segment of the launch services market.⁴

U.S. space companies are represented in all aspects of the international space economy as well as in the U.S. civil and national security space markets. U.S. commercial space companies are providing Astronaut carriage and cargo delivery to the International Space Station under contract with NASA. Notably the U.S. is the only country where private human spaceflight activities are currently occurring. The U.S. is also leading in the development of novel, space technologies, including commercial human destinations in Earth's orbit; in-space satellite servicing, assembly and manufacturing; lunar landers and rovers; and nuclear thermal propulsion.

Forward-looking policies that were implemented decades ago and thoughtfully extended and expanded, particularly the Commercial Space Launch Act, have significantly contributed to the U.S. commercial space industry's success. When the CSLA was originally codified in 1994, it was in anticipation of commercial launch, it did not yet include reentry or human spaceflight. Congress focused on the near-term issue and devised a tailored solution that has since been updated as the industry has evolved. As this Committee contemplates the oversight of emerging, commercial endeavors in space, a similarly tailored, flexible approach that can be updated as innovation and space exploration evolve will continue to serve the country's interest in

¹ This testimony is provided in my personal capacity; it does not represent any company or clients' views. It does rely, in part, on Steve Mirmina & Caryn Schenewerk, *International Space Law and Space Laws of the United States* (Cheltenham, UK; Northampton, MA: Edward Elgar, 2022).

² *State of the Satellite Industry Report*, SIA (2022) <https://sia.org/news-resources/state-of-the-satellite-industry-report/>.

³ *Ibid.*

⁴ The commercial launch market includes launch services provided to international commercial companies as well as foreign governments in accordance with U.S. export control laws.

maintaining its competitiveness, developing capabilities that advance our national security, and fostering safety.

The focus of my testimony will be U.S. Government oversight of commercial space activities, particularly the authorities granted under the Commercial Space Launch Act (CSLA), as amended. The intent is to provide the Committee with historical and legal context as well as a review of key space regulations and their implementation in order to inform its efforts to develop legislation that results in balanced and thoughtful regulations.

The U.S. space industry is highly regulated.

The companies that comprise the U.S. commercial space industry are regulated by a multitude of federal agencies as well as state and local governments. They may also be regulated by foreign governments, depending on where they are operating or providing services. The jurisdictions and resulting U.S. federal regulations are defined for certain companies based on their primary activities – launch, reentry, remote sensing, and telecommunications are regulated by the FAA, NOAA and FCC, respectively. That said, each of those activities may also require licenses from one or both of the non-primary regulating agency. In other words, an activity that is licensed by the FAA may also require a FCC and/or NOAA license.

If the space activity is “novel” such as in-space servicing, assembly, manufacturing or in-space destinations, such as LEO habitats or based on the moon or Mars, then it does not clearly fall within the licensing regimes of the three above-listed agencies. These novel activities have been the focus of National Space Council discussions in this and the last Administration. Significant support exists for the Department of Commerce’s Office of Commercial Space having “mission authority.” I recommend that this Committee support efforts to clarify agency authorities in a manner that is appropriate to the in-space activities and ensure that any regulatory regime is clearly defined. Continued uncertainty will diminish U.S. space leadership and is costly to companies developing these novel and necessary capabilities.

In addition to regulations governing companies’ space activities, their manufacturing activities, facilities and test sites are regulated by federal, state and local regulations governing environmental, labor and transportation activities, among others. For example, when companies ship space systems⁵ by road, air or sea, they are subject to state and federal transportation and safety regulations overseen by state departments of transportation, the U.S. DOT Pipeline and Hazardous Materials Safety Administration (PHMSA), Federal Aviation Administration, and U.S. Coast Guard. When companies utilize legacy U.S. government capabilities such as launch sites or test stands on U.S. Space Force or NASA facilities, for example, they are subject to the controlling agency’s rules and requirements.

U.S. space companies are also subject to Federal laws governing international trade in goods and services as well as foreign investment. US export control laws governing space activities include the International Traffic in Arms Regulations (ITAR), which controls the export and import of defense-related articles and services on the United States Munitions List (USML) and is

⁵ Launch vehicle, reentry vehicles, satellites, and other space hardware.

administered by the Directorate of Defense Trade Controls (DDTC) within the U.S. State Department. Activities and aerospace hardware not subject to the ITAR may be subject to Export Administration Regulations (EAR) under the Commerce Control List (CCL) administered by the Department of Commerce's Bureau of Industry and Security (BIS). Companies must also comply with the Office of Foreign Assets Control's various sanctions programs as well as the Committee on Foreign Investment in the United States' regulations.

International Space Law History & Context

In 1958, one year after Sputnik 1, the United Nations (UN) created an Outer Space Affairs Division. Also in 1958, the UN convened a Committee on the Peaceful Uses of Outer Space (COPUOS), which was made a permanent committee of the UN General Assembly one year later and still functions. COPUOS has been the primary source for the drafting of international space Law.

The UN Outer Space Treaties

COPUOS began drafting a series of UN General Assembly resolutions in the early 1960s regarding outer space, culminating in what crystallized in 1967 as the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty or OST).⁶ More than 100 States are Party to the OST,⁷ including major spacefaring nations such as Russia and China. The OST is the primary international legal instrument governing activities in outer space. This Treaty also provides the impetus for most nations around the world to draft their own domestic space laws and regulations.

The Treaty establishes several fundamental principles:

- the exploration and use of outer space shall be carried out for the benefit and in the interests of all States and shall be the province of all humankind;
- outer space shall be free for exploration and use by all States;
- outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means;
- States shall not place nuclear weapons or other weapons of mass destruction in orbit or on celestial bodies or station them in outer space in any other manner;
- the Moon and other celestial bodies shall be used exclusively for peaceful purposes;
- astronauts shall be regarded as the envoys of humankind;
- States shall be responsible for national space activities whether carried out by governmental or non-governmental entities;
- States shall be liable for damage caused by their space objects; and
- States shall avoid harmful contamination of space and celestial bodies.

⁶ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967), 610 *U.N.T.S.* 205, 18 *U.S.T.* 2410.

⁷ The list on the status of international agreements relating to activities in outer space is compiled and distributed by the United Nations Office for Outer Space Affairs, available online at <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/status/index.html>.

The OST does not contain a definition or delimitation of “outer space.” It does, however, make clear that many of its terms apply to not only the celestial bodies themselves, but also to all of the “space” between them.

The OST was followed by four additional Space Law treaties over the next 13 years. The first of these, which concluded in 1968, was the Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space (Rescue Agreement).⁸ The OST and Rescue Agreement were followed by the Convention on International Liability for Damage Caused by Space Objects (Liability Convention) in 1972.⁹ This Convention addresses the question of liability for damage caused by space objects – absolute liability for damage “on the surface of Earth or to an aircraft in flight,” versus fault-based liability for damage caused in space.¹⁰ In 1974, another space-related treaty came into force, the Convention on Registration of Objects Launched into Outer Space (Registration Convention).¹¹ The Registration Convention creates an obligation to register spacecraft as a means to assist in the identification of space objects.

United States Space Laws

The U.S. supervises the activities of its nationals in outer space through a combination of statutes and regulations. These laws implement the international obligations undertaken pursuant to the Outer Space Treaties, including the requirement in Article VI of the OST that States must provide “authorization and continuing supervision” of their nationals’ activities in outer space.

As noted previously, there are numerous Federal statutes that govern activities in outer space. For example, the Commercial Space Launch Competitiveness Act (CSLCA), which governs commercial space launch and reentry activities and is the primary focus of my testimony.¹² Other statutes include the Land Remote-Sensing Policy Act, which governs commercial remote sensing regulations by the Department of Commerce’s National Oceanic and Atmospheric Administration (NOAA) and the 1934 Communications Act, which created the Federal Communications Commission (FCC).

These various statutes authorize regulations that are found in the Code of Federal Regulations (CFR) and dictate the process for obtaining U.S. licenses to conduct space activities from the FAA, NOAA and FCC. U.S. space activities are also overseen by NASA and the Department of Defense (DOD), neither of which regulate commercial activities, though they do promulgate regulations governing their own activities.

⁸ Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space (1968), 672 U.N.T.S. 119; 19 U.S.T. 7570; 7 I.L.M. 149 (1968).

⁹ The Convention on International Liability for Damage Caused by Space Objects (1972), 961 U.N.T.S. 187; 24 U.S.T. 2389; 10 I.L.M. 965 (1971).

¹⁰ *Ibid.*

¹¹ Convention on Registration of Objects Launched into Outer Space (1974), 1023 U.N.T.S. 15; 28 U.S.T. 695; 14 I.L.M. 43 (1975).

¹² *See e.g.*, 51 U.S.C. §§ 50902-50923.

Commercial Space Launch Act and FAA AST

The Federal Aviation Administration’s Office of Commercial Space Transportation (FAA AST)¹³ within the U.S. Department of Transportation (DOT) licenses commercial launch and reentry activities, as well as spaceports. Unlike the rest of FAA, which is authorized under Title 49 “Transportation,” of the United States Code, authority for FAA AST is located in Title 51, “National and Commercial Space Programs” and was established by the Commercial Space Launch Act of 1984 (CSLA).¹⁴ The CSLA was amended in 1988 to add an indemnification regime to limit exposure to third party liability claims. The first licensed commercial launches occurred in 1989.¹⁵ Significant amendments to the CSLA followed in 1998,¹⁶ 2004¹⁷ and 2015,¹⁸ to address reusable launch vehicles and reentry licensing; private human spaceflight; and resource utilization, respectively.

Licensing for Launch, Reentry and Spaceports

A license is required for a person or entity subject to the FAA AST’s jurisdiction “to launch a launch vehicle or to operate a launch site or reentry site, or to reenter a reentry vehicle, in the United States.”¹⁹ A license is also required for a “citizen of the United States”²⁰ when they are operating a launch, reentry or launch/reentry site outside the United States.²¹ Launch and reentry sites are also referred to as spaceports.²²

FAA’s regulations are largely focused on protecting the public. Commercial launches, reentries and spaceports may only be regulated, “to the extent necessary [...] to ensure compliance with international obligations of the United States and to protect the public health and safety, safety of

¹³ The Office of Commercial Space Transportation originally reported directly to the U.S. Transportation Secretary. In November 1995 during an agency reorganization, the Office of Commercial Space Transportation (FAA AST) was transferred from the Secretary’s office to the Federal Aviation Administration (FAA) as the FAA’s only space-focused line of business.¹³

¹⁴ *About the Office of Commercial Space Transportation*, Federal Aviation Administration [hereinafter FAA], https://www.faa.gov/about/office_org/headquarters_offices/ast/. See, 51 U.S.C. § 50901 – 50923; Pub. L. No. 98-575; H.R. 3942, Commercial Space Launch Act, (Oct. 30, 1984) <https://www.congress.gov/bill/98th-congress/house-bill/3942>.

¹⁵ *Origins of the Commercial Space Industry*, FAA, https://www.faa.gov/about/history/milestones/media/commercial_space_industry.pdf.

¹⁶ Pub. L. 105-303.

¹⁷ Pub. L. 108-492.

¹⁸ Pub. L. 114-90.

¹⁹ 51 U.S.C. § 50904(a)(1).

²⁰ The definition for who is a “citizen of the United States” is uniquely defined by 51 U.S.C. § 50902(1)(A)-(C) as: “(A) an individual who is a citizen of the United States; (B) an entity organized or existing under the laws of the United States or a State; or (C) an entity organized or existing under the laws of a foreign country if the controlling interest (as defined by the Secretary of Transportation) is held by an individual or entity described in subclause (A) or (B) of this clause.”

²¹ 51 U.S.C. § 50904(a).

²² Part 420 of Title 14 of the Code of Federal Regulations governs launch site operator licenses (LSOL) site and Part 433 governs reentry site operator licenses (RSOL). A spaceport operator can obtain a LSOL and a RSOL for the same spaceport. A license to operate a launch and/or reentry site authorizes the licensee to offer its site to multiple operators. It does not include the license to perform the launch or the reentry. The vehicle operator seeking to conduct either of those activities must apply and receive a separate license under Part 450.

property, and national security and foreign policy interests of the United States.”²³ The primary focus of the licensing regulations and review is public safety, which requires the FAA to review the design, operation, and testing of a vehicle’s flight safety system as well as vehicle hazards, including debris, toxic release and overpressure.²⁴ Launches, reentries and spaceports are not regulated to protect the entities or people involved with the operations – the statute states that the FAA AST is not responsible for regulating to ensure mission success or to protect those people who are not defined as public.²⁵ That is intentionally different from the FAA’s regulation of aviation activities, which are regulated to protect the public as well as everyone involved in the flight, particularly paying passengers.²⁶ Additionally, FAA AST does not have statutory authority to regulate activities conducted on orbit; its authority is focused on public safety on Earth and in Earth’s navigable airspace.²⁷

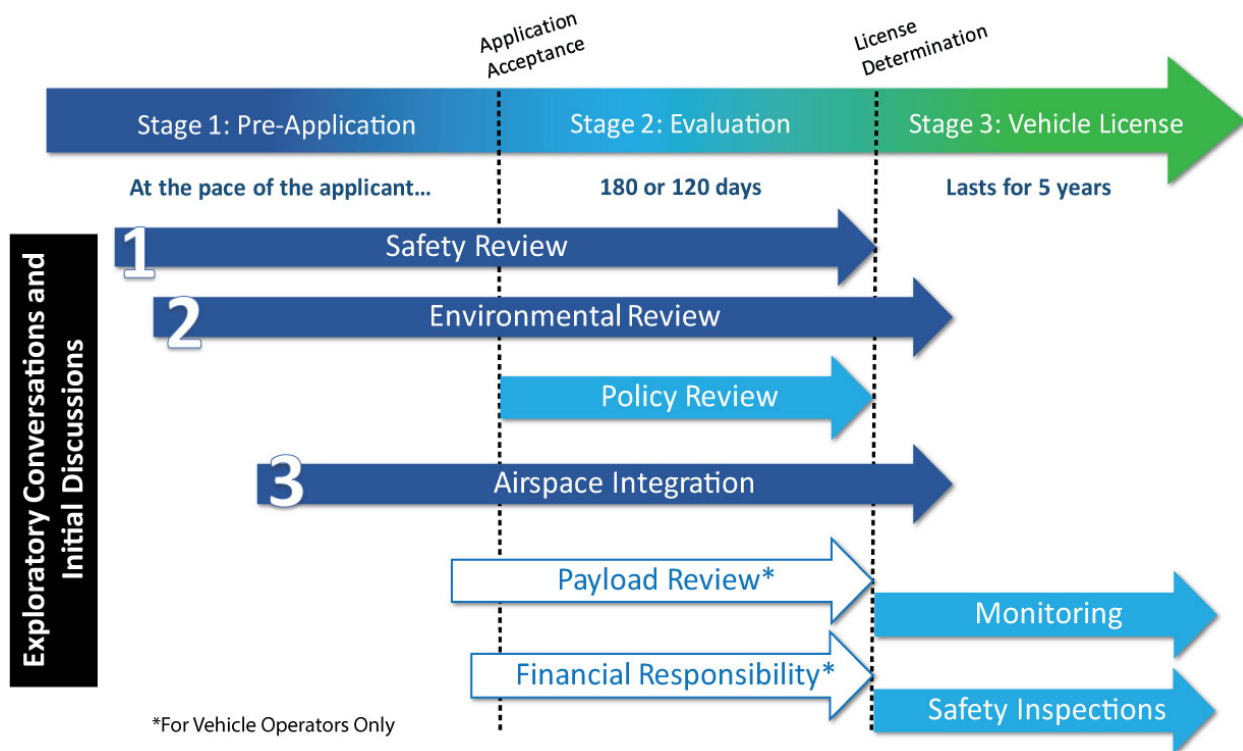


Figure 1. Process for Issuing Launch and Reentry Licenses.²⁸

²³ 51 U.S.C. § 50901(a)(7).

²⁴ The Section 450.101 safety criteria include four categories: individual risk, collective risk, aircraft risk, and risk to critical assets. For example, the risk associated with launch or reentry to an individual member of the public must be less than one in one million ($E_c \leq 1 \times 10^{-6}$). Applicants must demonstrate how they will ensure that the public is excluded from the hazard area for the FAA to grant the license.

²⁵ The FAA defined “public” in § 401.5 of 14 C.F.R. 450, to mean “for a particular licensed or permitted launch or reentry, people that are not involved in supporting the launch or reentry and includes those people who may be located within the launch or reentry site, such as visitors, individuals providing goods or services not related to launch or reentry processing or flight, and any other operator and its personnel.”

²⁶ See, e.g., 49 U.S.C. § 106(g).

²⁷ H. Rept. 108-492, Commercial Space Launch Amendments Act of 2004; See, 150 Cong. Rec. H703, 2004.

²⁸ *Getting Started with Licensing*, FAA, https://www.faa.gov/space/licenses/licensing_process/

The requirements for receiving a launch or reentry license are detailed in Chapter III, Part 450 of the Code of Federal Regulations, “Launch and Reentry License Requirement.”²⁹ Part 450 was published as a Final Rule in 2020 to streamline regulations that dated back to 1988. Members of industry raised significant concerns with certain aspects of Part 450 when it was published as a Proposed Rule as well as with the FAA’s approach to the rulemaking.³⁰

FAA’s Commercial Space Transportation Advisory Committee (COMSTAC) was tasked with reviewing Part 450 to identify aspects of the regulations that require additional clarification or a regulation change. That review identified a list of regulations that warrant clarification or change. Equally important, COMSTAC and industry members reported that Part 450 implementation is proving a significant challenge for the FAA and industry. Some of those issues are reflective of the downside of performance-based regulations, which require the Federal agency to have the expertise and resources to efficiently review innovative approaches that may result in a higher level of safety, but deviate from past, more familiar approaches. Recommendations to address these problems include support for FAA’s investment in process improvements and staffing in order to improve engineering and analysis expertise, communication, and accountability with regard to application review and status.

The elements of a Part 450 licensing process are shown in Figure 1. The time frame for Stages 1 and 2 regularly span two to three years or longer. To date, the FAA has only issued four licenses under Part 450 and has exceeded the 180-day review period for at least two of the four licenses, resulting in CSLA-required notices to this Committee.

Financial Responsibility and Indemnification

The Commercial Space Launch Act (CSLA) of 1984 included a requirement for licensees to carry liability insurance in an amount “necessary for the launch or operation, considering the international obligations of the United States.”³¹ In the 1994 CSLA updates, the insurance requirements were expanded and an indemnification regime was added.³² That bill clarified the license requirement for obtaining insurance to cover third party and certain U.S. Government claims arising from the licensed activities as codified in 51 U.S.C. 50914, “Liability Insurance and Financial Responsibility.” The required insurance is for claims by third parties – the uninvolved public – and for damage to United States Government property. Damages have never exceeded the required insurance coverage, but if they did, the indemnification regime would be triggered. That regime currently expires September 30, 2025.

The financial responsibility regulations are codified in Part 440, *Financial Responsibility for Licensed Launch Activities*.³³ Earlier this year, the FAA recognized the challenges that industry and government stakeholders have faced with applying aspects of Part 440 and initiated an Aerospace Rulemaking Committee (SpARC). I commend the FAA in taking this step and am honored to serve as the industry lead for the Part 440 SpARC. Our efforts are focused on

²⁹ 14 C.F.R. §450.

³⁰ See Docket Number FAA-2019-0229, Streamlined Launch and Reentry Licensing Requirements.

³¹ Pub. L. 98-575, § 16.

³² Pub. L. 103-272, § 70112.

³³ 14 C.F.R. §440.

developing recommendations for regulatory reforms to Part 440 to address challenges such as launch cadences, innovative operations, a specialized and limited insurance market and missions that were not originally contemplated. The SpARC has the opportunity to help the FAA as it prepares to draft updates to the Part 440 regulations. A successful outcome will modernize requirements and ensure that the FAA's approach protects the public and U.S. Government interests while taking a rational approach to calculating financial responsibility requirements and implementing reciprocal waivers of claims.

Regulation of Human Spaceflight

In 1996, the X Prize Foundation offered \$10 million for the first non-government organization to launch a reusable crewed spacecraft into space twice within two weeks. In light of the interest in human spaceflight generated by the X Prize, as well as the successful demonstration by Scaled Composites,³⁴ Congress passed the 2004 CSLAA.³⁵ The CSLAA required that the FAA issue regulations relating to crew, space flight participants (SFPs), and permits for launch or reentry of reusable suborbital rockets. Additionally, the CSLAA introduced the concept of the “learning period.”³⁶ Although the CSLAA granted the FAA authority over the safety of launch vehicles designed to carry humans, the “learning period” limited the FAA's ability to propose requirements governing the design or operation of a launch vehicle to protect the health and safety of certain people on board. The learning period was set to expire eight years after enactment, but has most recently been extended to January 1, 2024.³⁷

The CSLAA learning period does not limit all regulations regarding human spaceflight. For example, the FAA may regulate to protect crew members because they are part of a vehicle's flight safety system, which falls within FAA's public safety authority. In accordance with the CSLAA, the FAA developed 14 C.F.R. part 460, which prescribes the human space flight requirements an operator must follow if a launch or reentry will occur with people on board the launch or reentry vehicle. For launch and reentry with crew, crew members must complete training in nominal and off-nominal conditions on how to carry out their role on board or on the ground so that the vehicle will not harm the public, demonstrate certain abilities during spaceflight and meet medical requirements.³⁸ Pilots and remote operators must satisfy certain additional requirements focused on an understanding of the vehicle and an understanding of operating safely in the National Airspace System (NAS). Finally, an operator is required to provide environmental control and life support systems adequate to sustain life and consciousness for all inhabited areas within a vehicle.³⁹

³⁴ In 2004, Scaled Composites won the X Prize by being the first to finance privately, build, and launch a vehicle able to carry three people to an altitude of 100 kilometers (62 statute miles). *Launching A New Space Industry*, X Prize, <https://www.xprize.org/prizes/ansari>.

³⁵ For a discussion of the law and political landscape surrounding the 2004 Space Act, see, Timothy Robert Hughes & Esta Rosenberg, *Space Travel Law (and Politics): The Evolution of the Commercial Space Launch Amendments Act of 2004*, 31 J. Space L. 1 (2005).

³⁶ 51 U.S.C. § 50905(c)(9).

³⁷ Pub. L. 118-15 § 2202(k)

³⁸ 14 C.F.R. § 460.5(a), (b) & (e).

³⁹ 14 C.F.R. § 460.11. See also, *Environmental Control and Life Support Systems for Flight Crew and Space Flight Participants in Suborbital Space Flight*, FAA (Apr. 2010) https://www.faa.gov/about/office_org/headquarters_offices/ast/media/final_ECLSS_guide.pdf.

For launch and reentry with SFPs, an operator must train each SFP before flight on how to respond to emergency situations, including smoke, fire, loss of cabin pressure, and emergency exit.⁴⁰ Before receiving compensation or making an agreement to fly an SFP, an operator must inform the SFP in writing about the risks of launch and reentry, including the safety record of the launch or reentry vehicle type.⁴¹ The operator must also provide the SFP an opportunity to ask questions orally to better understand the risks and hazards of the mission.⁴² The SFP must provide consent in writing.⁴³ Finally, an SFP must execute a reciprocal waiver of claims with the FAA and the licensee in accordance with Part 440⁴⁴ and 51 U.S.C. 50914.⁴⁵

During the learning period, the FAA may also adopt regulations to restrict or prohibit design features or operating practices that (1) have resulted in a serious or fatal injury to persons on board during a licensed or permitted launch or reentry; or (2) contributed to an unplanned event or series of events during a licensed or permitted commercial human space flight that posed a high risk of causing a serious or fatal injury to persons on board.⁴⁶

In 2015, the Commercial Space Launch Competitiveness Act (CSLCA) extended the learning period to October 1, 2023, and directed the Secretary to “continue to work with the commercial space sector, including the [COMSTAC...], to facilitate the development of voluntary industry consensus standards based on recommended best practices to improve the safety of crew, government astronauts, and space flight participants as the [sector] continues to mature.”⁴⁷

Those efforts have been underway - industry has been developing consensus standards in the ASTM F47 Committee on Commercial Space. Additionally, the FAA has taken a step toward the development of regulations by initiating the Part 460 SpARC to review the existing regulations governing human space flight activities and in preparation for the learning period’s possible expiration. That Committee will develop consensus recommendations regarding future human space flight occupant safety regulations that will inform the FAA’s drafting of a future Notice of Proposed Rulemaking (NPRM).

The 2015 CSCLA also clarified FAA’s ability “to discuss potential regulatory approaches, potential performance standards, or any other topic related to [Section 50905(c)] with the commercial space industry, including observations, findings, and recommendations from the [COMSTAC], [...] prior to the issuance of a notice of proposed rulemaking.”⁴⁸

⁴⁰ 14 C.F.R. § 460.51.

⁴¹ 14 C.F.R. § 460.45(a).

⁴² 14 C.F.R. § 460.45(f).

⁴³ 14 C.F.R. § 460.45(f).

⁴⁴ 14 C.F.R. § 460.49.

⁴⁵ As part of the Commercial Space Launch Competitiveness Act passed in 2015, Congress added SFPs as applicable parties with whom a licensee must make a reciprocal waiver of claims. The FAA has not yet updated its regulations to reflect this addition. P.L. 114-119

⁴⁶ 51 U.S.C. § 50905(c)(2)(C).

⁴⁷ 51 U.S.C. § 50905(c)(3) & (9).

⁴⁸ 51 U.S.C. § 50905(c)(4).

Today, the United States is home to the only commercial human spaceflight activities currently carrying private citizens on orbital and suborbital flights, as represented by the three companies participating in this hearing. Given the still limited developments in commercial human spaceflight, the on-going opportunities for thoughtful engagement between the FAA and industry as well as the FAA's challenges with implementing its existing regulations, a learning period extension with direction for the FAA to engage meaningfully with industry to prepare for oversight responsibilities is warranted.

Mission Authorization for Novel Activities

U.S. space companies are rapidly innovating to bring new space capabilities to market for U.S. Government and non-government customers and, in many cases, leading the world in those efforts. Across the nation, there are a plethora of companies developing and demonstrating exciting in-space capabilities such as satellite servicing and maneuverability, private space stations, in-space manufacturing, nuclear power and propulsion technologies, and lunar rovers. U.S. policymakers should be preparing for these activities to evolve from being "novel" to defining our space capabilities. To foster those capabilities and U.S. competitiveness, companies are requesting regulatory certainty. This is not a new problem, but delays in solving it are having real consequences for the U.S. space industry and could affect our future space leadership.

The 2020 National Space Policy, as well as industry representatives and congressional legislation, have supported granting the Commerce Department's Office of Space Commerce (OSC) the authority to approve U.S. commercial in-space and in-situ operations, referred to as novel or nontraditional activities.⁴⁹ The rationale supporting OSC as the primary authorizing agency is sound. The Commerce Department is already a regulator of in-space activities that focuses on fostering a robust U.S. industry while protecting national security and complying with our international treaty obligations.

Efficient and effective interagency interactions and consultations will be key to a minimally burdensome regime for authorizing in-space missions. The interagency process must involve significant accountability and transparency married with clear timeframes. The widely-supported self-certification approach is a good starting place as we guard against an approach that encourages companies to leave the United States. As stated earlier, it is vital that agency authorities be delegated in a manner that is appropriate to the in-space activities being authorized. Modeling an approach on the CSLA would be beneficial – it would ensure that near-term capabilities are appropriately reviewed in a timely and efficient manner and allow for expanding authorities as the industry develops. Instead of trying to predict all possible future technologies and potential risks, a flexible approach will ensure compliance with our treaty obligations, avoid being overly burdensome and foster our national security. Lastly, I encourage

⁴⁹ The National Space Policy, 85 Fed. Reg. 81755 § 5.3.a (Dec. 9, 2020); *Reopening the American Frontier: Exploring How the Outer Space Treaty Will Impact American Commerce and Settlement in Space*, U.S. Senate Committee on Commerce, Science and Transportation (May 23, 2017) <https://www.commerce.senate.gov/2017/5/reopening-the-american-frontier-exploring-how-the-outer-space-treaty-will-impact-american-commerce-and-settlement-in-space>; American Space Commerce Free Enterprise Act, H. R. 2809, 115 Cong. § 3 (2017).

this Committee to continue to support a streamlined approach that avoids duplicative agency oversight, as it has since the 1994 CSLA.

* * *

I appreciate the invitation to testify before the Subcommittee today. These are exciting times for the U.S. space industry. My testimony has only scratched the surface of the space regulatory and policy landscape. U.S. space policy and legal oversight is extensive and is at its best when it effectively facilitates rapid technological and scientific advances while protecting public safety and national security interests. As the Committee considers commercial space legislation, it has the opportunity to continue U.S. leadership in diminishing regulatory uncertainty while facilitating continued space safety, innovation and competitiveness.