



SPACE AND AERONAUTICS SUBCOMMITTEE

HEARING CHARTER

“Risks and Rewards: Encouraging Commercial Space Innovation While Maintaining Public Safety”

Tuesday, September 10, 2024

10:00 AM

2318 Rayburn House Office Building

Purpose

The purpose of the hearing is to discuss ongoing efforts to streamline licensing for launch and related activities as well as to evaluate the appropriate structure for regulating commercial space activities outside the purview of the current regulatory structure.

Witnesses

- **Mr. Kelvin Coleman**, Associate Administrator for Commercial Space Transportation, Federal Aviation Administration
- **Mr. Dave Cavossa**, President, Commercial Spaceflight Federation
- **Mr. Mike French**, Founder, Space Policy Group, and Vice Chair, FAA Commercial Space Transportation Advisory Committee
- **Ms. Pamela L. Meridith**, Chair, Space Law Practice Group, KMA Zuckert LLC

Overarching Questions

- What regulatory structure best allows the United States to both ensure compliance with Outer Space Treaty obligations and facilitating the growth of United States’ private sector space activities?
- How have FAA efforts streamlined launch and reentry licensing, how have such reforms impacted industry, and what can Congress do to facilitate further regulatory streamlining efforts?

- How can FAA further improve licensing processes and review without compromising public safety and safety of property?

Background

Until the 1980s, the United States government (USG) was the sole supplier of domestic launch services. The National Aeronautics and Space Administration (NASA) and Department of Defense (DOD) purchased expendable launch vehicles (ELVs) from manufacturers and a spacecraft operator contracted with NASA for the launch of its payload.¹ After the Moon landings, the United States turned the focus of its space program towards developing a reusable launch capability, called the Space Transportation System (STS) or the Space Shuttle. The Shuttle was designed for lower-cost access to space, but to achieve the cost savings anticipated by the program, the shuttle needed to maintain a high flight-rate.² To further this goal, National Security Decision Directive Number 42 required that STS serve as the primary space launch system for government missions, both national security and civil.³ The directive also instructed that STS be made available to users outside of the United States government, including foreign and commercial users.⁴

Though operational Shuttle flights began in 1982, demand for launch services from the commercial, civil, and national security sectors exceeded Shuttle availability.⁵ It was during this same period that private entity Space Services, Inc. of America sought to launch its prototype launch vehicle, the Conestoga. Space Services was forced to spend significant time and resources obtaining approvals from several U.S. government agencies to conduct the launch.⁶ Secretary of Transportation Elizabeth Dole later claimed that an operator seeking to conduct space activities might need to work with up to 17 agencies to get necessary approvals.⁷ After braving the regulatory thicket, Conestoga ultimately launched in 1982, marking the first successful private launch in the United States.

Shortly after, National Security Decision Directive-94 was issued in 1983 to encourage commercialization of ELVs. Per the directive, the United States adopted a mixed-fleet approach to launch capabilities that continued use of the reusable government-operated Shuttle, but also supported the growth of a domestic ELV industry. To facilitate such commercial operations, the directive stated that the USG would “license, supervise, and/or regulate U.S. commercial ELV operations only to the extent required to meet its national and international obligations and to

¹ Federal Aviation Administration, *Origins of the Commercial Space Industry*, available at: https://www.faa.gov/sites/faa.gov/files/about/history/milestones/Commercial_Space_Industry.pdf.

² Congressional Research Service, *Space Launch Vehicles: Government Activities, Commercial Competition and Satellite Exports* (2006), available at: https://www.everycrsreport.com/files/20060320_IB93062_8c06795839d9d25d8bba98c69c1b2680f52e6424.pdf.

³ President Ronald Reagan, National Security Decision Directive Number 42, “National Space Policy” (July 4, 1982).

⁴ *Id.*

⁵ Federal Aviation Administration, *supra* note 1.

⁶ Michael Michaud, *Reaching for the High Frontier* (1986), available at: <https://nss.org/reaching-for-the-high-frontier-chapter-12/>.

⁷ Remarks of Secretary of Transportation Elizabeth Dole, (Jan. 1894).

ensure public safety.”⁸ The next year, President Reagan issued Executive Order 12645 designating the Department of Transportation as the lead agency responsible for licensing launch activities, a decision which was later affirmed by Congress’s passing of the Commercial Space Launch Act in 1984.⁹

Despite these changes in national policy, United States commercial ELV providers still struggled to gain a foothold in the market. Both STS and the French Ariane launch vehicle benefited from the support of their respective governments, enabling them to offer launch capabilities at lower prices with which private ELV providers could not compete. As representatives of one operator would later describe, “It was a price war in which the U.S. commercial industry could not participate since the cost for building one of our vehicles was much more than the price offered by either Shuttle or Ariane. The U.S. commercial industry could not compete with its own government.”¹⁰ This changed after the loss of *Challenger* in 1986. President Reagan reversed the policy prioritizing use of Shuttle, finding that “[t]he unique STS (Shuttle) capability to provide manned access to space will be exploited in those areas that offer the greatest national return” and that STS would “no longer provide launch services for commercial and foreign payloads unless those spacecraft have unique, specific reasons to be launched aboard the Shuttle.”¹¹ The decision to make Shuttle unavailable to most payload operators created renewed demand for ELV capabilities and allowed the commercial launch sector to grow.

The domestic legal framework for launch activities continued to evolve in the years that followed, as provisions were made for financial responsibility and government payment of claims, as well as licensing of reentry operations and limited human spaceflight regulation. Notably, outside of satellite communications and remote sensing space systems, no comparable framework was developed to address nongovernmental in-space activities. International competition has also grown substantially since the space race with the Soviet Union, and spacefaring actors now also including China, Japan, and India, among others, as well as foreign businesses engaging in space operations. Because of this growing competition, to maintain its position as a space leader, the United States must continue to develop and improve its national legal frameworks for nongovernmental space activities in a manner that enables private sector innovation.

International Obligations

The United States is party to the Outer Space Treaty (OST), a multilateral agreement executed in 1967 that forms the basis for international space law.¹² At the time of drafting, the two major spacefaring nations, the United States and the Soviet Union, faced an impasse when it came to the role of non-state entities participating in space operations. The United States sought to secure

⁸ President Ronald Reagan, National Security Decision Directive Number 94, “Commercialization of Expendable Launch Vehicles” (May 16, 1983).

⁹ Commercial Space Launch Act of 1984 (P.L. 98-575).

¹⁰ Dunbar, Dennis R. and Scherer, Lee R., “Paper Session II-B - The U.S. Commercial Launch Services Industry and International Competition” (1989), available at: <https://commons.erau.edu/space-congress-proceedings/proceedings-1989-26th/april-26-1989/15>.

¹¹ President Ronald Reagan, National Security Decision Directive Number 254, available at: www.reaganlibrary.gov/public/archives/reference/scanned-nsdds/nsdd254.pdf.

¹² Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, ratified 1967, available at: <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>.

rights for the private sector to engage in space activities, while the Soviet Union proposal required that exploration and use of outer space be “carried out solely and exclusively by states.”¹³ Ultimately, the two nations reached a compromise; private sector actors could conduct space operations, but states would retain responsibility and liability for the actions of their nationals.¹⁴

Article VI of the OST memorializes this compromise, stating that each signatory bears “international responsibility for national activities in outer space... whether such activities are carried on by governmental agencies or by non-governmental entities.”¹⁵ Further, Article VII of the OST states that each signatory is “internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons”¹⁶ caused by a space object or its components. While the OST establishes international obligations of the United States with respect to other States, the United States administers its own national space law through several regulatory agencies based on the type of space operations proposed by a nongovernmental entity.

United States Authorization of Nongovernmental Space Activities

Today, federal agencies share responsibility for regulating space activities. The Department of Transportation (DOT) licenses launch and reentry and the operation of spaceports, a responsibility it administratively delegates to the Federal Aviation Administration (FAA). The National Oceanic and Atmospheric Administration (NOAA) regulates the operation of private space remote sensing systems through its Commercial Remote Sensing Regulatory Affairs division (CRSRA). The Federal Communications Commission (FCC) licenses radio communications that use satellites. Often, space activities can also fall into the purview of other agencies; for example, the Department of State administers the International Traffic in Arms Regulations, which apply to the export of certain space technologies.

In 2018, the Trump Administration issued Space Policy Directive-2 (SPD-2), which directed federal agencies to streamline regulations applicable to nongovernmental space activities and triggered a series of reform efforts.¹⁷

Launch, Reentry, and Operation of Spaceports

As stated above, the Secretary of Transportation is tasked with licensing launches and reentries, issuing experimental permits, and licensing operation of spaceports to “protect public health and safety, safety of property, and national security and foreign policy interests of the United States. DOT also must “encourage private sector launches, reentries, and associated services and, only to the extent necessary, regulate those launches, reentries, and services to ensure compliance with

¹³ United Nations, Committee on the Peaceful Uses of Outer Space, Union of Soviet Socialist Republics: Draft Declaration of the Basic Legal Principles Governing the Activities of States Pertaining to the Exploration and use of Outer Space, A/AC.105/L.2 (1962) pg. 2, para. 7. Available at: http://www.unoosa.org/pdf/limited/I/AC105_L002E.pdf.

¹⁴ F.G. von der Dunk, “The Origins of Authorization: Article VI of the Outer Space Treaty and International Space Law”, Space, Cyber, and Telecommunications Law Program Faculty Publications, University of Nebraska-Lincoln (2011) at 3.

¹⁵ *Id.* supra note 12.

¹⁶ *Id.* supra note 12.

¹⁷ President Donald Trump, Space Policy Directive-2, “Streamlining Regulations on Commercial Use of Space” (May 24, 2018), available at: <https://trumpwhitehouse.archives.gov/presidential-actions/space-policy-directive-2-streamlining-regulations-commercial-use-space/>

the international obligations of the United States...”¹⁸ DOT also has very limited authority over human spaceflight as it relates to operation of a launch vehicle with impacts for public safety. DOT delegates these authorities to FAA, which executes these functions through its Office of Commercial Space Transportation (AST).

AST has promulgated a series of rules set forth in Chapter III of Title 14 Code of Federal Regulations (CFR). AST established requirements for expendable vehicle launch licensing (Part 415), additional launch safety regulations (Part 417), and regulations for licensing the launch and reentry of reusable launch vehicles (Part 431) as well as all other reentry licenses (Part 435). For these activities, a license holder is also required to comply with financial responsibility requirements under 14 CFR Part 440. Finally, Chapter III also set forth requirements for licensing the operation of launch sites and reentry sites (Parts 420 and 433, respectively). Since 1989, AST has licensed 715 launches, over 40% of which took place in 2022 or later. AST also granted its first reentry license in 2010 and has issued 44 reentries to date. AST expects these numbers will continue to grow rapidly, projecting an annual rate of between 123-288 licensed launches and reentries by FY2027.¹⁹

Launch and reentry vehicle concepts have evolved since 1989 and the diverse array of vehicle designs and operations strained the ability of operators to comply with the more prescriptive aspects of the licensing process.²⁰ As noted above, in an effort to reevaluate regulation of space activities, reduce burden on operators, and facilitate growth of the commercial space economy, President Trump issued SPD-2, directing a streamlining of commercial space regulations. Among its provisions, SPD-2 instructed the Secretary of Transportation to review launch and reentry licensing requirements and consider revisions to the existing licensing regime. In particular, the Secretary was directed to evaluate the possibility of implementing a single type of license that could cover multiple operations and that was granted based on compliance with performance-based criteria, making the licensing process adaptable for a range of diverse and evolving launch and reentry operations.

Approximately one year after the issuance of SPD-2, in April 2019, the FAA published a Notice of Proposed Rulemaking (NPRM), "Streamlined Launch and Reentry Licensing Requirements." The NPRM "sought to create a single comprehensive licensing regime" by consolidating consideration of operations currently addressed under Parts 415, 417, 431, and 435 into a new licensing process under Part 450 "that defines licensing requirements that apply to all launch and reentry vehicles."²¹ FAA sought to replace the existing prescriptive licensing regulations with performance-based requirements, and to issue non-binding Advisory Circulars that described potential methods an operator could use to fulfill such performance-based requirements. In December of 2020, the FAA issued the final rule formally establishing the Part 450 licensing

¹⁸ 51 U.S. Code § 50901.

¹⁹ Federal Aviation Administration, Aerospace Forecast Fiscal Years 2023-2043, available at: <https://www.faa.gov/sites/faa.gov/files/2023-Commercial%20Space.pdf>

²⁰ Wayne Monteith, Josh Easterson, and John Sloan, "Streamlining FAA Commercial Space Transportation Regulations", International Astronautical Congress, D6.1.2 (2019), available at: https://www.faa.gov/sites/faa.gov/files/space/additional_information/international_affairs/Streamlining_FAA_Regulations_IAC_Washington_Monteith.pdf

²¹ *Id.*

process. The rule became effective on March 10, 2021, and FAA stopped accepting applications for non-Part 450 launch and reentry licenses in June of 2021.²²

Two years after the rule went into effect, FAA's Commercial Space Transportation Advisory Committee (COMSTAC) directed its Regulatory Working Group (RWG) to review the Part 450 licensing process. The RWG solicited industry for feedback on the Part 450 licensing process, and sought to identify any requirements that would benefit from further clarification or even a rule change. In July 2023, COMSTAC released a report titled "Part 450 – Challenges and Recommendations."²³ Common themes from the COMSTAC report include the following:

- "The importance of Advisory Circulars (ACs). Issues have been reported regarding applicants utilizing ACs and discovering errors or having their resulting documentation rejected. FAA should specify the types of systems or operational data that may impact ground and/or flight safety."
- "The timeframes for reviewing application materials and providing timely feedback are a cause of concern. Lack of transparency and reliable timeframes for receiving FAA feedback were reported during the pre-application consultation prior to 'acceptance,' during the official review period and while the review period was officially tolled."
- "While Part 450 was intended to provide more flexibility, applicants' experiences were often the opposite. Instead of allowing for diverse approaches that were tailored to the vehicle or operations, the review process drove applicants toward strict requirements and, in some cases, placing limits on their operations with no public safety benefit."
- "In combining licensing of launch and reentry operations, Part 450 subjects reentry applicants to numerous requirements that are not applicable or appropriate. The FAA should revise Part 450 to address challenges with requirements that are distinct to launch or reentry. Similarly, ACs should distinguish between launch vs. reentry license requirements or at least include distinct sections discussing the difference in applicability of many of the regulations."
- "The FAA should provide more transparency into the software and analysis tools that have been accepted for use. That information would offer new applicants the ability to efficiently develop a plan for compliance for Flight Safety Analysis, toxic release analysis, etc."
- "The FAA should also develop and implement a change control process for technical standards. That process should account for the impact of changing technical standards during an ongoing licensing effort."
- "The RWG also received concerns about the FAA's ability to efficiently and timely process Part 450 application materials. Multiple licensees reported their license review

²² Federal Aviation Administration, Streamlined Launch and Reentry License Requirements, 85 Fed. Reg. 78566 (issued Dec. 20, 2020), available at: <https://www.govinfo.gov/content/pkg/FR-2020-12-10/pdf/2020-22042.pdf>

²³ Commercial Space Transportation Advisory Committee, Regulatory Working Group, "Part 450 – Challenges and Recommendations (July 2023)", available at: <https://www.faa.gov/media/68016#:~:text=To%20date%2C%20four%20%284%29%20of%20the%20twenty-six%20%2826%29,actively%20processing%20dozens%20of%20Part%20450%20license%20applications.>

timeframes exceeding the statutory 180-day review period despite the FAA utilizing its tolling authority while document revisions and reviews were actively underway."

Congress seeks to assess the extent to which the Part 450 licensing process streamlined regulations under SPD-2, and whether such regulatory reforms succeeded in easing the burden of regulatory compliance experienced by commercial launch and reentry providers. It is also beneficial for Congress to consider whether there are other aspects of Part 450 licensing that could benefit from further study and improvement.

Commercial Remote Sensing Operations

The Land Remote-Sensing Policy Act in 1992²⁴ granted authority to the Department of Commerce (DOC) to license the operation of private space remote sensing systems. The Secretary has delegated this responsibility to NOAA.²⁵ The Secretary reviews applications and consults with other agencies of the USG on matters of national security or foreign policy related to the proposed operations, when appropriate.

Following the streamlining direction of SPD-2, CRSRA implemented regulatory reforms for licensing of private remote sensing in 2020.²⁶ CRSRA adopted a new approach to reviewing applications, creating three categories of remote sensing systems based on availability of the same kind of unenhanced data generated by an applicant's system from other sources. The assigned category of the system influences the stringency of operating conditions, if any, placed on an applicant's license.

Satellite Communications

Under the Communications Act of 1934, FCC has authority to license commercial communications using radio frequencies and to implement the Radio Regulations of the International Telecommunication Union.²⁷ FCC views spacecraft engaging in radiofrequency communications as stations located in space, and therefore requires satellite operators to obtain a license. In a recent reorganization, FCC established a Space Bureau dedicated to managing policy and licensing matters related to satellite communications.²⁸

FCC has taken an increasingly broad interpretation of its statutory authority to issue licenses "if public convenience, interest, or necessity will be served thereby."²⁹ FCC has cited this authority when considering areas not directly related to radiofrequency use, such as orbital debris mitigation and, more recently, proposed rules related to in-space servicing, assembly, and manufacturing operations.³⁰

²⁴ Land-Remote Sensing Policy Act of 1992 (P.L. 102-555).

²⁵ Department of Commerce, Department Organizational Order 10-15 (issued December 12, 2011).

²⁶ *Id.* supra note 17; see also National Oceanic and Atmospheric Administration, Licensing of Private Remote Sensing Space Systems, 85 Fed. Reg. 30790 (issued May 20, 2020).

²⁷ Communications Act of 1934 (P.L. 73-416).

²⁸ Federal Communications Commission, "FCC Space Bureau & Office of International Affairs to Launch April 11" (April 7, 2023), available at: <https://www.fcc.gov/document/fcc-space-bureau-office-international-affairs-launches-april-11>.

²⁹ 47 U.S.C. §307(a).

³⁰ Federal Communications Commission, Space Innovation; Facilitating Capabilities for In-Space Servicing, Assembly, and Manufacturing, 89 Fed. Reg. 18875 (proposed Mar. 15, 2024) available at:

Mission Authorization

As private sector space activity grows, commercial entities are conceptualizing and developing new and unique space applications that are not captured under existing statutory authority. For example, companies plan to operate private space stations, perform on-orbit servicing and manufacturing, and engage in space resource utilization. When novel space activities do not clearly fall within the existing regulatory authority of DOT, DOC, FCC, or any other federal agency, it can lead to a perception of legal uncertainty for operators (and investors) when it comes to U.S. authorization and supervision of their activities.

The issue of establishing a regulatory framework for such in-space activities is not new.¹⁷ During the Obama administration, the White House Office of Science and Technology Policy proposed that DOT authority be expanded to include regulation of in-space operations. Comparatively, in the 2020 National Space Policy, the Trump Administration charged DOC with the task of developing a mission authorization process.³¹ The National Space Council Users Advisory Group (UAG) has also prepared a set of recommendations for mission authorization which proposed “included a presumption of approval, strict review timelines, and having the process handled by one agency “to minimize confusion and compliance burden.”³² As part of the ongoing efforts to establish a process to demonstrate compliance with Article VI of the OST, last year both Congress and the White House released proposals for a "mission authorization" framework.³³

The White House proposal takes a bifurcated approach, dividing regulatory authority for in-space activities between DOC and DOT. It charges DOT with authorization of all human spaceflight activities, including crewed missions on orbit as well as on other celestial bodies. It would also provide DOT regulatory authority over transportation of materials in space. The proposal also grants DOC authority to regulate uncrewed space activities, such as orbital debris removal and certain in-space manufacturing operations. The proposal introduces an interagency consultation process whereby federal agencies outside of DOT and DOC can assess an application for concerns related to national security, foreign policy, and broadly any other national interest of the United States.

By contrast, H.R. 6131, the Commercial Space Act, grants authority over any in-space operations not governed by existing FAA or FCC authorities to a single agency – the Department of Commerce. The Act takes a light touch by establishing a process for reviewing proposed operations to ensure compliance with OST obligations, and to formally confirm United States authorization and supervision of such activities, in accordance with OST Article VI.

<https://www.federalregister.gov/documents/2024/03/15/2024-05389/space-innovation-facilitating-capabilities-for-in-space-servicing-assembly-and-manufacturing>.

³¹ President Donald Trump, “National Space Policy of the United States of America” (Dec. 9, 2020), available at: <https://trumpwhitehouse.archives.gov/wp-content/uploads/2020/12/National-Space-Policy.pdf>

³² Jeff Foust, “An extended mission for authorization”, THE SPACE REVIEW (Dec. 18, 2023) available at: <https://www.thespacereview.com/article/4712/1>.

³³ The Commercial Space Act of 2023, H.R. 6131, 118th Cong. (2023); *see also* The White House, *United States Novel Space Activities Authorization and Supervision Framework* (Dec. 2023), available at: <https://www.whitehouse.gov/wp-content/uploads/2023/12/Novel-Space-Activities-Framework-2023.pdf>.