

**RISKS AND REWARDS:
ENCOURAGING COMMERCIAL SPACE INNOVATION
WHILE MAINTAINING PUBLIC SAFETY**

HEARING
BEFORE THE
SUBCOMMITTEE ON SPACE AND AERONAUTICS
OF THE
COMMITTEE ON SCIENCE, SPACE,
AND TECHNOLOGY
OF THE
HOUSE OF REPRESENTATIVES
ONE HUNDRED EIGHTEENTH CONGRESS

SECOND SESSION

SEPTEMBER 10, 2024

Serial No. 118-46

Printed for the use of the Committee on Science, Space, and Technology



Available via the World Wide Web: <http://science.house.gov>

U.S. GOVERNMENT PUBLISHING OFFICE

56-688PDF

WASHINGTON : 2025

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

HON. FRANK LUCAS, Oklahoma, *Chairman*

BILL POSEY, Florida	ZOE LOFGREN, California, <i>Ranking Member</i>
RANDY WEBER, Texas	SUZANNE BONAMICI, Oregon
BRIAN BABIN, Texas	HALEY STEVENS, Michigan
JIM BAIRD, Indiana	JAMAAL BOWMAN, New York
DANIEL WEBSTER, Florida	DEBORAH ROSS, North Carolina
MIKE GARCIA, California	ERIC SORENSEN, Illinois
STEPHANIE BICE, Oklahoma	ANDREA SALINAS, Oregon
JAY OBERNOLTE, California	VALERIE FOUSHEE, North Carolina
CHUCK FLEISCHMANN, Tennessee	KEVIN MULLIN, California
DARRELL ISSA, California	JEFF JACKSON, North Carolina
RICK CRAWFORD, Arkansas	EMILIA SYKES, Ohio
CLAUDIA TENNEY, New York	MAXWELL FROST, Florida
SCOTT FRANKLIN, Florida	YADIRA CARAVEO, Colorado
DALE STRONG, Alabama	SUMMER LEE, Pennsylvania
MAX MILLER, Ohio	JENNIFER McCLELLAN, Virginia
RICH McCORMICK, Georgia	GABE AMO, Rhode Island
MIKE COLLINS, Georgia	SEAN CASTEN, Illinois,
BRANDON WILLIAMS, New York	<i>Vice Ranking Member</i>
TOM KEAN, New Jersey	PAUL TONKO, New York
VINCE FONG, California	
GREG LOPEZ, Colorado	

SUBCOMMITTEE ON SPACE AND AERONAUTICS

HON. BRIAN BABIN, Texas, *Chairman*

BILL POSEY, Florida	ERIC SORENSEN, Illinois,
DANIEL WEBSTER, Florida	<i>Ranking Member</i>
MIKE GARCIA, California	JEFF JACKSON, North Carolina
DARRELL ISSA, California	YADIRA CARAVEO, Colorado
DALE STRONG, Alabama	JAMAAL BOWMAN, New York
RICH McCORMICK, Georgia	JENNIFER McCLELLAN, Virginia

C O N T E N T S

September 10, 2024

	Page
Hearing Charter	2
Opening Statements	
Statement by Representative Brian Babin, Chairman, Subcommittee on Space and Aeronautics, Committee on Science, Space, and Technology, U.S. House of Representatives	10
Written Statement	11
Statement by Representative Eric Sorensen, Ranking Member, Subcommittee on Space and Aeronautics, Committee on Science, Space, and Technology, U.S. House of Representatives	12
Written Statement	13
Statement by Representative Frank Lucas, Chairman, Committee on Science, Space, and Technology, U.S. House of Representatives	14
Written Statement	15
Statement by Representative Zoe Lofgren, Ranking Member, Committee on Science, Space, and Technology, U.S. House of Representatives	16
Written Statement	17
Witnesses:	
Mr. Kelvin Coleman, Associate Administrator for Commercial Space Transportation, Federal Aviation Administration	
Oral Statement	18
Written Statement	20
Mr. Dave Cavossa, President, Commercial Spaceflight Federation	
Oral Statement	29
Written Statement	31
Mr. Mike French, Founder, Space Policy Group, and Vice Chair, FAA Commercial Space Transportation Advisory Committee	
Oral Statement	47
Written Statement	50
Ms. Pamela L. Meredith, Chair, Space Law Practice Group, KMA Zuckert LLC	
Oral Statement	58
Written Statement	60
Discussion	73
Appendix I: Answers to Post-Hearing Questions	
Mr. Kelvin Coleman, Associate Administrator for Commercial Space Transportation, Federal Aviation Administration	98
Mr. Dave Cavossa, President, Commercial Spaceflight Federation	128
Ms. Pamela L. Meredith, Chair, Space Law Practice Group, KMA Zuckert LLC	133
Appendix II: Additional Material for the Record	
Letter submitted by Representative Brian Babin, Chairman, Subcommittee on Space and Aeronautics, Committee on Science, Space, and Technology, U.S. House of Representatives	
Mat Dunn, Senior Director, Government Affairs, SpaceX	140

**RISKS AND REWARDS: ENCOURAGING
COMMERCIAL SPACE INNOVATION
WHILE MAINTAINING PUBLIC SAFETY**

TUESDAY, SEPTEMBER 10, 2024

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON SPACE AND AERONAUTICS,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Subcommittee met, pursuant to notice, at 10:01 a.m., in room 2318 of the Rayburn House Office Building, Hon. Brian Babin [Chairman of the Subcommittee] presiding.



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. Meredith**, 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/l/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%292%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>.

Chairman BABIN. The Subcommittee on Space and Aeronautics will come to order, please.

Without objection, the Chair is authorized to declare recesses of the Subcommittee at any time.

Welcome to today's hearing entitled "Risks and Rewards: Encouraging Commercial Space Innovation While Maintaining Public Safety." I'd like to recognize myself for 5 minutes for an opening statement.

Two of my highest priorities as Chairman of the Space Subcommittee have been to ensure U.S. leadership in space exploration and to maintain a robust commercial space industry. These two priorities go hand in hand, and both have significant implications for our economic competitiveness and our national security. And that's also why this Committee has worked tirelessly to streamline commercial space regulations over the last decade.

Prior to Space Policy Directives 1, 2, and 3, this *Committee* passed the *Commercial Space Launch Competitiveness Act* and the *American Space Commerce Free Enterprise Act* that sought to update and streamline all aspects of commercial space. Thankfully, the Trump Administration continued the process with the aforementioned Space Policy Directives, but now we must review the implementation of those directives and codify necessary updates through that—through legislation.

The Committee started this process last November with the passage of the *Commercial Space Act* out of Committee. The importance of that legislation has become even more apparent since then. License processing under the new part 450 process is moving at a snail's pace while the Administration seeks even more regulatory authority, all while our competitors continue to make significant progress. And I fear that at this rate, the Communist Party will launch taikonauts to the Moon, while U.S. industry remains tethered to Earth with red tape.

Inefficiencies in our launch licensing process cause me great concern as they compromise our competitiveness and security, and that is why today's hearing is so important. The FAA's (Federal Aviation Administration's) part 450 launch and reentry regulations were intended to expedite the licensing process and enable an increased cadence for launches. So far, FAA has issued six licenses under part 450 with applications taking years to complete. Many applications for part 450 licenses are still under review, impacting launch schedules and NASA (National Aeronautics and Space Administration) missions.

We've heard complaints about duplicative review processes between FAA and other government agencies, uncertain timelines, and the lack of definitive and specific implementation guidance. In this hearing, we look to understand the benefits and challenges of part 450. We also hope to hear FAA's plans and timeline for much-needed improvement of part 450 implementation, whether through additional reform efforts, rulemaking committees, additional advisory circulars, creation of a new electronic filing system, or other strategies to aid in application processing. Having an effective licensing system is critical to the future of our country's economic and national security.

The United States leads in commercial space, but we cannot ever take that for granted. Under the increasing burden of regulatory compliance, companies may turn to more light-touch approvals available overseas. This is not hypothetical, and when the United States dragged its feet approving commercial remote sensing systems in the 1990's, the industry simply moved overseas. And now, with nations like China seeking to leapfrog our accomplishments in space, it is even more imperative that we streamline our processes, issue timely approvals, minimize regulatory burdens, and advance innovative space concepts.

The national security implications posed by the FAA regulations are very concerning, as our goal of returning humans to the Moon could be unnecessarily delayed. For example, the human landing system that will take our astronauts to the lunar surface this decade, the many test missions needed before that will require an FAA launch license. It is imperative that we are the first country back on the lunar surface so that we can establish norms of behavior and transparent practices that align with freedom rather than the CCP's (Chinese Communist Party's) autocracy. China routinely violates international norms right here on Earth, so I wouldn't be surprised if they attempted to place "no trespassing" signs on the Moon.

And that's why, last fall, Chairman Lucas and I introduced H.R. 6131, the *Commercial Space Act*. This legislation would direct the Department of Commerce to issue certifications for novel space activities, allowing innovation to thrive, while ensuring compliance with the United States' international obligations. This legislation also included provisions addressing the processes and systems that could enable more effective and efficient launch licensing, while still maintaining public safety. I look forward to working with my colleagues on both sides of the aisle here to advance this legislation.

I would welcome our esteemed panel of witnesses today. Thank you all for being here. They bring—each of you bring decades of experience and a unique perspective to the topic of space activity licensing that will benefit this Subcommittee's consideration of these very significant topics.

[The prepared statement of Chairman Babin follows:]

Two of my highest priorities as Chairman of the Space Subcommittee have been to ensure U.S. leadership in space exploration, and to maintain a robust commercial space industry. These two priorities go hand-in-hand, and both have significant implications to our economic competitiveness and national security. That's also why this Committee has worked tirelessly to streamline commercial space regulations over the last decade.

Prior to Space Policy Directives 1, 2, and 3, this Committee passed the *Commercial Space Launch Competitiveness Act* and the *American Space Commerce Free Enterprise Act* that sought to update and streamline all aspects of commercial space. Thankfully, the Trump Administration continued the process with the aforementioned Space Policy Directives. But now we must review the implementation of those directives, and codify necessary updates through legislation.

The Committee started this process last November with the passage of the *Commercial Space Act* out of Committee. The importance of that legislation has become even more apparent since then. License processing under the new Part 450 process is moving at a snail's pace while the Administration seeks even more regulatory authority, all while our competitors continue to make significant progress. I fear that at this rate, the Communist Party will launch Taikonauts to the Moon while U.S. industry remains tethered to Earth with red tape.

Inefficiencies in our launch licensing process cause me great concern, as they compromise our competitiveness and security. That is why today's hearing is so important.

The FAA's Part 450 launch and reentry regulations were intended to expedite the licensing process and enable an increased cadence of launches. So far, FAA has issued six licenses under Part 450, with applications taking years to complete. Many applications for Part 450 licenses are still under review, impacting launch schedules and NASA missions. We've heard complaints about duplicative review processes between FAA and other government agencies, uncertain timelines, and the lack of definitive and specific implementation guidance.

In this hearing, we look to understand the benefits and challenges of Part 450. We also hope to hear FAA's plans and timeline for much-needed improvement of Part 450 implementation, whether through additional reform efforts, rulemaking committees, additional Advisory Circulars, creation of a new electronic filing system, or other strategies to aid in application processing.

Having an effective licensing system is critical to the future of our country's economic and national security.

The United States leads in commercial space, but we cannot take this for granted. Under the increasing burden of regulatory compliance, companies may turn to more light-touch approvals available overseas. This is not a hypothetical. When the U.S. dragged its feet approving commercial remote sensing systems in the 90s, the industry moved overseas. Now, with nations like China seeking to leapfrog our accomplishments in space, it is even more imperative that we streamline our processes, issue timely approvals, minimize regulatory burdens, and advance innovative space concepts.

The national security implications posed by FAA's regulations are very concerning, as our goal of returning humans to the Moon could be unnecessarily delayed. For example, the Human Landing System that will take our astronauts to the Lunar surface this decade, as well as all of the test missions before that, will require an FAA launch license. It is imperative that we are the first country back on the Lunar surface so that we establish norms of behavior and transparency that align with freedom rather than the CCP's autocracy. China routinely violates international norms here on Earth, so I wouldn't be surprised if they attempted to place "no trespassing" signs on the Moon.

That's why last fall Chairman Lucas and I introduced H.R. 6131, the *Commercial Space Act*. This legislation would direct the Department of Commerce to issue certifications for novel space activities, allowing innovation to thrive while ensuring compliance with United States' international obligations. This legislation also included provisions addressing the processes and systems that could enable more effective and efficient launch licensing, while still maintaining public safety. I look forward to working with my colleagues to advance this legislation.

I welcome our esteemed panel of witnesses today. They each bring decades of experience and a unique perspective to the topic of space activity licensing that will benefit this Subcommittee's consideration of these topics.

Chairman BABIN. So now I would like to recognize the Ranking Member for his opening statement.

Mr. SORENSEN. Thank you, Chairman Babin, for holding today's hearing entitled "Risks and Rewards: Encouraging Commercial Space Innovation While Maintaining Public Safety."

I also want to welcome our distinguished panel of witnesses today. Thank you for your time, your expertise, and for being here today.

When you grow up with a dad who's an aerospace engineer who worked on the shuttle program, you'll learn a lot about what is in our infinite frontier. And now, as the Ranking Member of this Subcommittee, it is our job to figure out how we make space a catalyst for inspiration as we work together to develop our STEM (science, technology, engineering, and mathematics) workforce, innovate, and then grow our economy.

We rely on space systems and technologies to communicate, to navigate, monitor, and understand the Earth and our ever-changing climate, and perhaps most importantly, to discover and explore. Increasingly, space is also important to our national security. To

realize the benefits of space, we need to access space and often return systems back to Earth. Launch and reentry services, largely provided by the commercial sector, are a gateway. Commercial launch and reentry services are essential to our civil, commercial, and national security activities in space.

Back in 1984, through this Committee's leadership, Congress granted the Secretary of Transportation the authority to license commercial launch systems consistent with public health, safety of property, national security, and foreign policy interests of the United States. The Secretary later delegated the authority to the Federal Aviation Administration. Congress has amended and updated the original statute as the industry has evolved. To date, the FAA has licensed over 700 commercial space launches that have occurred without any impact to public safety or significant impact to any public property. Mr. Chairman, that is an impressive safety record that we can all and we should be proud of. I want to thank the public servants at the FAA for their hard work, dedication, and commitment to maintaining safety.

Of more than 700 licensed launches to date, 40 percent have occurred in just the last 3 years. With the increasing number of launches, it's important the FAA keep pace in its licensing and safety practices. But this is not an easy task because the FAA also transitions to updated launch and reentry regulations issued in 2020, navigates licenses for innovation—innovative systems and concepts of operation, and monitors the emergent—emerging commercial human spaceflight industry and the eventual need for safety framework.

Today's hearing provides an opportunity to consider how we support the FAA and the commercial space industry at large, responding to this period of tremendous growth. Are the new regulations meeting their intended goals? Do we have the necessary workforce, the necessary infrastructure, and resources to respond? Do we understand the implications of those activities on our environment? And are we prepared for accidents should those occur?

I look forward to hearing from our witnesses on what this Committee and Congress can do to sustain a safe, vibrant, and leading U.S. commercial space launch and reentry industry.

Thank you, Mr. Chairman. I yield back.

[The prepared statement of Mr. Sorensen follows:]

Good morning. Thank you, Chairman Babin, for holding today's hearing entitled "Risks and Rewards: Encouraging Commercial Space Innovation While Maintaining Public Safety." I also want to welcome to our distinguished panel of witnesses. Thank you for being here.

When you grow up with a dad who is an aerospace engineer, you learn a lot about our infinite frontier. And now as Ranking Member on this Subcommittee, it is our job to figure out how to make space a catalyst for inspiration as we work together to develop our STEM workforce, innovate, and grow our economy.

We rely on space systems and technologies to communicate, navigate, monitor and understand the Earth and our changing climate, and, perhaps most importantly, to discover and explore. Increasingly, space is also important to our national security.

To realize the benefits of space, we need to access space and, often, return systems back to Earth. Launch and reentry services, largely provided by the commercial sector, are the gateway.

Commercial launch and reentry services are essential to our civil, commercial, and national security activities in space.

In 1984, through this Committee's leadership, Congress granted the Secretary of Transportation authority to license commercial launch systems consistent with pub-

lic health, safety of property, national security, and foreign policy interests of the United States.

The Secretary later delegated the authority to the Federal Aviation Administration. Congress has amended and updated the original statute as the industry has evolved. To date, the FAA has licensed over 700 commercial space launches that have occurred without any impact to public safety or significant impact to public property.

Mr. Chairman, that's an impressive safety record that we can all be proud of. I want to thank the public servants at the FAA for their hard work, dedication, and commitment to maintaining safety.

Of the more 700 licensed launches to date, about 40 percent have occurred in just the last three years. With the increasing number of launches, it is important the FAA keep pace in its licensing and safety services. But this is not an easy task, especially as the FAA also:

- Transitions to updated launch and reentry regulations issued in 2020;
- Navigates licenses for innovative systems and concepts of operation; and
- Monitors the emerging commercial human spaceflight industry and the eventual need for a safety framework.

Today's hearing provides an opportunity to consider how we support the FAA and the commercial space industry at-large in responding to this period of tremendous growth.

Are the new regulations meeting their intended goals? Do we have the necessary workforce, infrastructure, and resources to respond? Do we understand the implications of those activities on the environment? And are we prepared for accidents, should they occur?

I look forward to hearing from our witnesses on what this Committee and Congress can do to sustain a safe, vibrant, and leading U.S. commercial space launch and reentry industry. Thank you, Mr. Chairman, and I yield back.

Chairman BABIN. Thank you, Mr. Sorensen.

And now, I'd like to recognize the Chairman of the Full Committee, Mr. Lucas, for a statement.

Chairman LUCAS. Thank you, Mr. Chairman.

In this Congress, a consistent theme of the Committee's work has been to ensure U.S. competitiveness in science technology, including our Nation's commercial space activities. This is particularly important as we examine space policy and consider how to continue leadership from the U.S. commercial space sector.

To this end, we have considered the role of commercial entities play in the future of space exploration and how collaboration between government and industry can both further national space objectives and support the development of a space economy. Importantly, we've also considered how the Federal Government can authorize and supervise the activities of non-governmental entities without limiting innovation and technological achievements.

In 2018, the Trump Administration Space Policy Directive number 2, commonly known as SPD-2, triggered a governmentwide review of the administrative framework applicable to space activities. SPD-2 directed agencies to streamline licensing processes and otherwise reduce the burden of regulatory compliance for space operators. Five years have passed, and it's time to assess the effectiveness of these reform efforts.

Today's hearing will review the licensing process for launch and reentry vehicles administered by the Department of Transportation via the Federal Aviation Administration. In 2020, FAA issued the streamlining launch and reentry license requirements final rule. This sought to establish a single licensing process that applied to all types of launch and reentry operations by replacing the existing prescriptive requirements with performance-based criteria. Now, 3 years into—since the rule went into effect, we seek to understand

the impact of the new licensing process and the extent to which it accomplished the goals of SPD-2. We will consider progress in implementing the rule and identify areas which may benefit from further improvement.

Beyond our review of the license—launch licensing, we also consider the approach behind the United States’ regulation of space activities of all kinds. How did the existing structures evolve over time? What lessons can be learned as we look to grant new authority over—in space activities? How have past efforts affected the pace of innovation? How do we continue to encourage commercial space activity moving forward?

Last fall, this Committee addressed many of these issues in the *Commercial Space Act*, sponsored by Chairman Babin. This legislation provided regulatory certainty to the American commercial space sector, while streamlining the licensing process for launch reentry. The morning that we marked that legislation up, the National Space Council unveiled—did I say the morning that we marked that legislation up, the National Space Council unveiled a legislative proposal for mission authorization that, while well-intended, created more burdens for our commercial space industry. This proposal would require commercial operators to go through a maze of regulatory agencies before launch and creates a confusing process even the most—for the most seasoned regulatory experts. This is why we must advance the *Commercial Space Act* and not wait for another Congress to act.

I hope my colleagues will join me in moving forward this important legislation, and I thank our witnesses for joining us today. Each of our panelists bring a different perspective on these issues, and I look forward to hearing their thoughts.

[The prepared statement of Chairman Lucas follows:]

This Congress, a consistent theme of the Committee’s work has been to ensure U.S. competitiveness in science and technology, including our nation’s commercial space activities. This is particularly important as we examine space policy and consider how best to continue leadership from the U.S. commercial space sector.

To this end, we have considered the role commercial entities play in the future of space exploration, and how collaboration between government and industry can both further national space objectives and support the development of a space economy.

Importantly, we have also considered how the federal government can authorize and supervise the activities of nongovernmental entities without limiting innovation and technological achievements.

In 2018, the Trump Administration’s Space Policy Directive-2, commonly known as SPD-2, triggered a government-wide review of the administrative framework applicable to space operations. SPD-2 directed agencies to streamline licensing processes and otherwise reduce the burden of regulatory compliance for space operators. Five years have passed, and it’s time to assess the effectiveness of these reform efforts.

Today’s hearing will review the licensing process for launch and reentry activities, administered by the Department of Transportation via the Federal Aviation Administration. In 2020, FAA issued the “Streamlining Launch and Reentry License Requirements” final rule. This sought to establish a single licensing process that applied for all types of launch and reentry operations by replacing the existing prescriptive requirements with performance-based criteria.

Now, three years since this rule went into effect, we seek to understand the impact of the new licensing process and the extent to which it accomplished the goals of SPD-2. We will consider progress in implementing the rule and identify areas which may benefit from further improvement.

Beyond our review of launch licensing, we also consider the approach behind the United States’ regulation of space activities of all kinds. How did the existing structures evolve over time and what lessons can be learned as we look to grant new

authority over in-space activities? How have past efforts affected the pace of innovation, and how do we continue to encourage commercial space activity moving forward?

Last fall, this Committee addressed many of these issues in the *Commercial Space Act*, sponsored by Chairman Babin. This legislation provided regulatory certainty to the American commercial space sector while streamlining the licensing process for launch and reentry.

The morning that we marked up that legislation, the National Space Council unveiled a legislative proposal for mission authorization that, while well-intentioned, created more burdens for our commercial space industry. This proposal would require commercial operators to go through a maze of regulatory agencies before launch and creates a confusing process for even the most seasoned regulatory experts.

This is why we must advance the *Commercial Space Act* and not wait for another Congress to act. I hope my colleagues will join me in moving forward this important legislation.

I thank our witnesses for joining us today. Each of our panelists today brings a different perspective on these issues, and I look forward to hearing their thoughts.

Chairman LUCAS. And with that, Mr. Chairman, thank you, and I yield back.

Chairman BABIN. Thank you, Mr. Chairman. I really appreciate it.

And now I'd like to recognize the Ranking Member of the Full Committee for a statement, Ms. Lofgren.

Ms. LOFGREN. Well, thank you, Chairman Babin and Ranking Member Sorensen, for holding today's hearing. We need to encourage commercial space innovation, but also, we need to maintain public safety. And I want to welcome our panel of distinguished witnesses. Thank you for being here.

You know, the U.S. commercial space industry is vibrant, it's growing, and this is good for our economy, and it's good for all of us who benefit from the many applications of space technologies and capabilities. The launch and reentry industry is a pillar of not only our commercial space industry, but also our civil and national security space programs. It is literally what gets us there.

Four years ago, as has been mentioned, the FAA's Office of Commercial Space Transportation (AST) issued new regulations that were intended to streamline the process of getting a launch or reentry license and enable greater innovation, flexibility, and efficiency. The implementation of these regulations and getting it right is one of the most pressing issues for the commercial space industry today, and I'm pleased, therefore, that we're discussing this important topic. We need a modern, commonplace regulatory system that can accommodate and enable the growing industry and its increasing pace of activity.

It's no surprise that the cadence and complexity of launch operations and systems is adding significant strain to the system. In many ways, this is a good problem to have if we can ensure the necessary support and resources are available to manage it. Now, Congress, on a bipartisan basis, recognizes the need to better equip the FAA to support the growing commercial space industry. Even with a constrained budget environment. FAA's Office of Commercial Space Transportation has seen budget increases in recent years. Probably more increases are needed in large part to allow FAA to hire the right people to handle the increasing workload. But as is so often the case, we are asking the agency to do a lot with a limited budget.

My guess is, however, that budget increases alone are not enough to get us where we need to be. To that end, I'm eager to hear today from our witnesses about concrete, actionable solutions to ensure that the FAA Office of Commercial Space Transportation can more efficiently and effectively carry out its mission to regulate commercial space launch and reentry, but this must be consistent with the public health and safety and safety of property, in addition, of course, to our national security and foreign policy interests.

I look forward to the testimony today, and I thank you, and I yield back.

[The prepared statement of Ms. Lofgren follows:]

Thank you, Chairman Babin and Ranking Member Sorensen, for holding today's hearing on encouraging commercial space innovation while maintaining public safety. I also want to welcome our panel of distinguished witnesses. Thank you for being here.

The U.S. commercial space industry is vibrant and growing. This is good for our economy, and it is good for all of us who benefit from the many applications of space technologies and capabilities. The launch and reentry industry is a pillar of not only our commercial space industry, but also our civil and national security space programs. It is literally what gets us there.

Four years ago, the FAA's Office of Commercial Space Transportation issued new regulations intended to streamline the process of getting a launch or reentry license and enable greater innovation, flexibility, and efficiency. The implementation of these regulations, and getting it right, is one of the most pressing issues for the commercial space industry today. I'm pleased we are discussing this important topic. We need a modern, commonplace regulatory system that can accommodate and enable the growing industry and its increasing pace of activity.

It's no surprise that the cadence and complexity of launch operations and systems is adding significant strain to the system. In many ways, this is a good problem to have, if we can ensure the necessary support and resources are available to manage it.

Congress, on a bipartisan basis, recognizes the need to better equip the FAA to support a growing commercial space industry. Even amidst a constrained budget environment, FAA's Office of Commercial Space Transportation has seen budget increases in recent years. More increases are needed, in large part to allow FAA to hire the right people to handle the increasing workload.

As is so often the case, we are asking an agency to do a lot with a limited budget.

I suspect, however, that budget increases alone are not enough to get us where we need to be. To that end, I am eager to hear today from our witnesses about concrete, actionable solutions to ensure that the FAA Office of Commercial Space Transportation can more efficiently and effectively carry out its mission to regulate commercial space launch and reentry consistent with the public health and safety, safety of property, national security, and foreign policy interests of the United States.

I look forward to the testimony today. Thank you, and I yield back.

Chairman BABIN. Thank you, Ms. Lofgren.

Now, I'd like to have the honor of introducing our witnesses. Our first witness today is Mr. Kelvin Coleman, who serves as the Associate Administrator for Commercial Space Transportation at the Federal Aviation Administration. In this role, he oversees the regulation of the commercial space industry, as well as the development and implementation of FAA regulations. Prior to joining the FAA, Mr. Coleman served as a systems engineer for the U.S. Air—excuse me, U.S. Naval Air Systems Command.

Our next witness is Mr. Dave Cavossa, who serves as the President of the Commercial Spaceflight Federation, or CSF, where he leads efforts to promote the development and maturation of the commercial space industry. Prior to joining CSF, Mr. Cavossa worked as the lead for U.S. Government Business at Agility Be-

yond Space and has served as the Executive Director and Chair of the board at the Satellite Industry Association.

Our third witness is Mr. Mike French, who founded and leads the Space Policy Group, which provides independent space policy analysis. He also serves as a senior advisor on space issues to BCG. Mr. French has also previously served as NASA's Chief of Staff.

And our final witness is Ms. Pamela Meredith. Ms. Meredith serves as the Chair of the Space Law Practice Group at KMA Zuckert where she advises clients on subjects including FAA licensing. She also serves as an adjunct professor of satellite communications and space law at American University's Washington School of Law.

I want to thank each and every one of you witnesses for being here today.

And now I'd like to recognize Mr. Coleman for 5 minutes to present his testimony. Mr. Coleman?

**TESTIMONY OF MR. KELVIN COLEMAN,
ASSOCIATE ADMINISTRATOR
FOR COMMERCIAL SPACE TRANSPORTATION,
FEDERAL AVIATION ADMINISTRATION**

Mr. COLEMAN. Good morning and thank you. Chair Lucas, Chair Babin, Ranking Member Lofgren, and Ranking Member Sorensen, and Members of the Subcommittee, thank you for the opportunity to be here today to discuss the FAA Office of Commercial Space Transportation's ongoing efforts to streamline and improve our processes and regulatory framework to enable safe space transportation.

Commercial space transportation operations are increasing in complexity, diversity, and frequency, creating a significant growth in demand for FAA licensing products and services. This year, we are on pace to exceed last year's operations by more than 30 percent. Over the course of our 40-year history, we have licensed or permitted more than 800 U.S. commercial space operations and have met our mission on every one. Safety is the FAA's North Star and is critical to the uninterrupted success of an industry that has become so vitally important to our Nation.

The law requires that we make new license determinations for accepted applications within a period of no more than 180 days, and we've hit that mark 98 percent of the time, averaging 151 days to issue a new license. Making timely licensing determinations requires a commitment from government as well as industry to be thorough, transparent, and efficient, always in ways that uphold public safety and meet regulatory requirements.

The FAA recognizes the importance of regulatory certainty and has made it a top priority, ensuring our licensing requirements are understandable, achievable, and actionable. To facilitate industry licensing, we have offered office hours and workshops where industry can meet with us to ask questions and discuss issues, provided checklists and visual tutorials to aid in application development, issued advisory circulars to help shepherd compliance with regulatory compliance—regulatory requirements, and made investments in the development of new tools that will improve license application and processing efficiency.

Industry bears the responsibility for demonstrating compliance with safety regulations and plays a significant role in helping the FAA reach licensing determinations faster. Navigation of the regulatory process cannot be an afterthought. Applications should speak directly to our requirements when first submitted. Thorough and complete applications that are presented at the outset of the licensing process with clear narratives supporting means of compliance lead to faster determinations.

Further, it is important that applicants minimize amendments and changes in the application under review, as these changes often have a broad ripple effect and slow the pace of determinations. Thanks to recent support from Congress, we have been able to increase our staff size, which has allowed us to address some of the growing demands that we're facing as we've seen industry operations grow more than 900 percent in the last decade.

In closing, I like to speak briefly about our streamlined launch and reentry requirements regulation. The part 450 rule, which was published in March 2021, is performance-based and fosters flexibility, efficiency, and innovation while maintaining safety. By March 2026, all licenses must be issued under part 450. We strongly encourage the industry to submit their part 450 applications and not wait until the 11th hour. It is my strong belief and conviction that part 450 will move us in the right direction toward efficiency for both the government and industry, will contribute to safety, and will open the door to greater innovation.

Thank you again for the opportunity to discuss this important topic today, and I look forward to your questions.

[The prepared statement of Mr. Coleman follows:]

**STATEMENT OF KELVIN B. COLEMAN
ASSOCIATE ADMINISTRATOR, COMMERCIAL SPACE TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
HEARING BEFORE THE UNITED STATES HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON SPACE AND AERONAUTICS
RISKS AND REWARDS: ENCOURAGING COMMERCIAL SPACE INNOVATION
WHILE MAINTAINING PUBLIC SAFETY
SEPTEMBER 10, 2024**

Chair Lucas, Chair Babin, Ranking Member Lofgren, Ranking Member Sorensen, and members of the subcommittee, thank you for the opportunity to be here today to discuss the important role the Department of Transportation (DOT) and the Federal Aviation Administration (FAA) have in enabling safe commercial space transportation. As the regulator of commercial space transportation, we are committed to ensuring the safety and economic competitiveness of the U.S. commercial space transportation industry. Maintaining our safety record is a key to the uninterrupted growth of this industry that has become an important economic engine for our nation. A safe industry is a successful industry.

U.S. commercial space capabilities and innovation are vitally important to our Nation. Space exploration has an impact on our everyday lives in countless ways and many benefits are yet to be realized. The commercial space transportation industry continues to develop new technologies that hold tremendous potential for further advancements that will assure our Nation's access to space, take us back to the moon and to other interplanetary destinations, connect global communities, better serve the planet, and improve the daily lives of our citizens. Commercial space activity worldwide increases every day, resulting in a half-trillion dollar global space economy that will nearly double in the next decade. The United States contributes roughly half of all commercial space activity, and the U.S. commercial space industry will continue to be an extremely important contributor to the growth of this space economy.

I'm here before you today to discuss how our office drives the mission to enable safe space transportation and our ongoing efforts to streamline and improve our regulatory framework and processes.

Overview of the Office of Commercial Space Transportation and its Responsibilities

The Secretary of Transportation (Secretary), in accordance with Title 51 of the United States Code, regulates and oversees U.S. commercial space transportation operations, which include launch and reentry operations worldwide, the operation of launch and reentry sites, and human space flight missions. This authority has been delegated by the Secretary to the FAA, and I have led the FAA's Office of Commercial Space Transportation (AST) as the Associate Administrator since September 2022. Our office carries out these authorities to protect public health and safety, the safety of property, and the national security and foreign policy interests of the United States. In addition to these important responsibilities, our office is also responsible for encouraging, facilitating, and promoting commercial space launches and reentries by the private sector and facilitating the strengthening and expansion of U.S. space transportation infrastructure. To put it simply, the U.S. relies on our office to ensure public safety while enabling safe commercial space transportation, and we recognize and embrace the central role the DOT and the FAA play in ensuring the U.S. continues to be the global leader in space.

Licensing and Permitting of Commercial Space Transportation Operations

Commercial space transportation operations are increasing in complexity, diversity, and frequency, creating a significant growth in demand for AST's licensing and permitting services and our resulting safety oversight.

Since 1989, the FAA has licensed or permitted more than 800 commercial space transportation operations, more than any other country in the world by far. To put the growth of

the U.S. commercial space transportation sector into perspective, this fiscal year, AST has overseen the safety of 130 launch and reentry operations, which is more than triple the number of licensed operations that occurred in fiscal year 2020—and the year isn't over yet. Additionally, we made 150% more application determinations in fiscal year 2024 as compared to fiscal year 2020. The catalyst for this increase is that we have seen steady growth of licensed vehicle operators and now have 26 licensed commercial launch and reentry operators.

The FAA has leveraged its licensing and regulatory capabilities and other various programs and initiatives in a manner that has resulted in an impressive safety record for this rapidly growing industry. No FAA-licensed launch or reentry operation has ever resulted in a fatality or injury to a member of the public, nor has there been any significant public property damage. I've encouraged our team to learn from every operation and to identify potential risks so that potential hazards and vulnerabilities become smaller and fewer. Looking forward, we expect the total number of licensed commercial space operations to double by fiscal year 2026. The FAA is committed to meeting this increased demand.

The safety record is the result of our licensing and permitting process, consisting of three phases: pre-application consultation, application evaluation, and operations and compliance monitoring. Prior to submitting an application, license and permit applicants are required to consult with the FAA to discuss the application process and other information relevant to the FAA's licensing or permitting determination. Pre-application consultation marks the formal beginning of a relationship between AST and an applicant, and this phase of the licensing and permitting process ends when the applicant formally submits an application that is accepted by AST for evaluation. AST is required by statute to make a licensing determination within 180 days from license application acceptance and a permit determination within 120 days from

permit application acceptance. During the application evaluation phase, AST reviews an application for compliance with applicable regulations and determines whether to issue an authorization (i.e., license or permit) to the applicant. The following reviews are conducted as part of an evaluation: a policy review, a payload review, a safety review, a financial responsibility determination, and an environmental review. Further, once AST issues a license or permit, it must ensure that the licensee or permittee complies with the governing statute, regulations, representations made in the application, and the terms and conditions of the license or permit. After a license or permit has been issued, operators frequently make changes to the vehicle configuration, launch procedures, or operations that may require the operator to apply for a license or permit modification. AST must evaluate all such changes in making determinations to approve or deny any modification to a license or permit. An applicant may also request a waiver(s) to regulatory provisions, and AST must evaluate and respond to each waiver petition to determine if it can be granted in the public's interest and will not jeopardize public health and safety, the safety of property, or any national security or foreign policy interest of the United States. In the event there is a launch- or reentry-related mishap, AST or the National Transportation Safety Board oversees the mishap investigation.

We understand the importance of making timely licensing and permitting determinations and continue to make it our priority— over the last 11 years, we have issued 49 license determinations, averaging 151 days to issue a new license. We have taken action to improve our internal efficiency, which includes bolstering our staffing to handle licensing, permitting, and inspections; improved communication with industry that is clear, concise, specific, and actionable; wider availability through office hours and workshops; and investments in the development of new tools that will improve license application and processing efficiency.

We have also highlighted to industry a number of steps they can take to speed up license and permit determinations. We continue to encourage operators to ensure their licensing applications speak directly to our requirements at the outset, with clear narratives that spell out their safety case—exactly how their methodologies support the means of compliance. Additionally, it is important that operators minimize amendments and go-backs after their application review has started. When operators require significant changes to their applications, it often leads to significant and additional delays, as our experts have to verify and validate the changed data and its effects on other areas of the application. When a quality application is provided by an applicant at the start, a more expeditious approval is possible. The burden of proof of compliance rests with the operator, and with the increased demands placed on our office, we need operators to submit well-reasoned applications that clearly spell out means of compliance to make the most efficient and effective use of our resources.

The FAA's impressive safety record and ability to meet the needs of this rapidly growing industry are in large part because of the incredible staff that we have in AST. FAA-licensed commercial operations have grown in the last decade by over 900%. Thanks to recent support from Congress, utilizing various hiring and recruiting authorities, we have been able to increase our total staff size to 150 staff members, which allows us to address some of the growing demands that have been placed on our office. The President's fiscal year 2025 Budget Request continues this support by providing funding for the agency to hire additional staff to conduct authorization evaluations, safety analyses, and safety inspections.

FAA's Commercial Space Regulatory Framework

AST has embraced a mindset and methods to become better, smarter, more agile, and more efficient—always in ways that won't compromise safety. In December 2020, the FAA

published a final rule to overhaul our launch and reentry regulations and consolidate, update, and streamline all launch and reentry regulations into a single performance-based part, which is found in Title 14, Code of Federal Regulations, Part 450 (Part 450). This rule replaced prescriptive public safety requirements with performance-based requirements to provide more flexibility, allow more methods of compliance, and clear the path for innovation. We designed Part 450 to allow a commercial space operator to obtain a license for a portfolio of launch and reentry operations, which allows for different vehicle configurations, mission profiles, and even multiple sites under one license. The rule was developed to reduce the number of times an operator would need to come to the FAA for an approval and reduce the need to process waivers, improve regulatory clarity, and relieve administrative and cost burdens on industry and the FAA. Another benefit of Part 450 is that it enables an operator to streamline and include negotiated timelines for certain reporting requirements, which allows operators to design the reporting component of their program to fit their specific needs within a safe capacity.

Additionally, Part 450 enables coordination between the FAA and our Federal range partners, including the National Aeronautics and Space Administration and the Department of Defense, on ground safety at Federal launch sites to eliminate gaps and duplication in oversight. By March 10, 2026, all launch and reentry licenses issued by the FAA under legacy regulations will no longer be valid, and launch and reentry vehicle operators must be in compliance with Part 450. We are encouraging industry to apply under Part 450 as soon as possible.

Currently, operators with proven launch vehicles and well-established concepts of operations, who could transition the soonest and benefit the most from Part 450, aren't yet using it for their programs. New operators have begun using Part 450, but not to its fullest extent. As we approach these next 18 months, through various initiatives, AST is working to ensure

industry has a full understanding of how to achieve compliance with Part 450 and how to take advantage of its intended benefits. To facilitate industry transition to Part 450, we have provided an assortment of aids, including license application checklists, advisory circulars, as well as virtual tutorials, office hours, and workshops. Part 450 will move us in the right direction toward efficiency and workload reductions for both the government and industry without compromising safety. As we look to the future, we will also continue to consider opportunities to improve the rule to better meet its objectives and identify other aids and resources to facilitate industry transition to Part 450. Additionally, we are also working to utilize advanced tools to adapt to the changing landscape. We are developing a Licensing Electronic Application Portal (LEAP), which will be used to accept, modify, exchange, and approve licensing materials under Part 450. LEAP is expected to enhance our ability to identify, track, and quickly resolve questions and issues both internally and externally with applicants. LEAP will streamline the licensing process for new applicants, provide more transparency into the process, and guide applicants in a step-by-step process.

Conclusion

I once again would like to reiterate the importance of the work we do at the FAA to enable safe space transportation. We have undertaken significant efforts to update our regulations and processes to create more capacity, and we continue to encourage legacy operators to move to the more efficient licensing process established under Part 450, well before they are required to do so. The Department of Transportation, the Federal Aviation Administration, and the Office of Commercial Space Transportation, are here to ensure the U.S. continues to be the global leader in space by leading safely. We know the consequences can be enormous if we get it wrong—consequences for our lives, our planet, industry, and more. That's

why we remain committed to safety as our North Star. We will continue leveraging our licensing and regulatory capabilities, as well as other programs and initiatives, to enable the success of the U.S. commercial space transportation industry and ensure the U.S. remains the preeminent commercial space country of choice. Thank you again for the opportunity to discuss the important role DOT and the FAA play in enabling safe commercial space transportation. This concludes my testimony, and I will be glad to answer any questions from the Committee.

FAA Associate Administrator for Commercial Space Transportation

Kelvin B. Coleman is the Associate Administrator for Commercial Space Transportation (AST) at the Federal Aviation Administration (FAA). In this role, he leads the office responsible for enabling safe space transportation and protecting the health and safety of the public, the safety of property, and the national security and foreign policy interests of the United States.



Mr. Coleman was named associate administrator in 2022, and prior to that had served as acting associate administrator or deputy associate administrator since 2017.

During this time, he has overseen regulation of the commercial space industry, and development and implementation of FAA regulations and services necessary to meet a tremendous growth in stakeholder needs as commercial companies provide space transportation to civil, military, international and private customers. In 2023, his office licensed 124 launch and re-entry operations, a 48 percent increase just from a year earlier.

Mr. Coleman has prepared the AST organization to meet these growing industry demands by establishing strategic priorities, restructuring the organization for increased efficiency and agility, acquiring advanced tools, and advocating for additional resources.

Mr. Coleman has also led efforts to establish clear authorities involving commercial space activity by working closely with other agencies including the National Space Council, the National Transportation Safety Board, NASA, the U.S. Space Force, and the Departments of Defense and Commerce to ensure transparency and clarity among all stakeholders. He has led global leadership initiatives to educate and collaborate with numerous international allies seeking to grow their space services.

Prior to joining the FAA, Mr. Coleman worked for the U.S. Naval Air Systems Command (NAVAIR) as a systems engineer, and as a guidance, navigation, and control engineer for several weapon system acquisition programs.

Mr. Coleman earned a bachelor of science degree in electronics and computer engineering from George Mason University and a master's in business administration from Marymount University.

Chairman BABIN. Thank you. I'd now like to recognize Mr. Cavossa for 5 minutes to present his testimony.

**TESTIMONY OF MR. DAVE CAVOSSA,
PRESIDENT, COMMERCIAL SPACEFLIGHT FEDERATION**

Mr. CAVOSSA. Thank you. Chairman Babin, Chairman Lucas, Ranking Member Sorensen, Ranking Member Lofgren, and distinguished Members of the Subcommittee, thank you for inviting me to testify today on behalf of the Commercial Spaceflight Federation and our 80-plus member companies. I'm honored to share our members' experiences and concerns with the FAA's implementation of its part 450 launch and reentry regulations, which, without change, could substantially reduce the pace of innovation and impede national competitiveness with China.

Industry shares FAA's absolute commitment to protecting public safety, and is proud of our perfect public safety record to date, as noted by Mr. Coleman. Today, the U.S. commercial spaceflight industry leads the world with a commercial launch every roughly 2 1/2 half days, and that cadence continues to increase. As noted by Mr. Coleman, the volume of U.S. licensed launches has increased dramatically and will continue to increase as the space industry continues to rapidly mature. It is for this reason why we are so concerned with where we are today with the current implementation of part 450.

Part 450 was originally intended to streamline launch and reentry licensing processes, provide a performance-based regulatory framework, and allow for multi-mission licenses. However, the way it is being implemented today has caused severe licensing delays, confusion, and is jeopardizing our long-held leadership position.

The current licensing process is costing our member companies millions of dollars for each mission and, when combined with uncertainty and schedule delays, is crippling our efforts to launch and reenter new vehicles, support new customers, and raise new capital. For instance, an investor question our members often hear these days when raising money is how are you handling the FAA licensing process?

Here are just two examples of the many challenges we're facing. No. 1, the preapplication process or, as industry refers to it, playing a game of "bring me a rock." Companies get stuck in an endless back-and-forth process as they discuss means of compliance approval without guidance on what the FAA is actually looking for. This process is taking years. AST has made it clear in its own statements that industry will need additional guidance via advisory circulars to effectively implement part 450. Four years after debuting part 450, many of these expected advisory circulars are still missing and are needed greatly. And I won't even get into the challenges associated with trying to reenter vehicles right now.

These are just a few of the six major challenges I've laid out in my written testimony. We greatly appreciate the hard work of Kelvin and the FAA's dedicated staff. I think they're doing their best today to keep the licensing system semi-functional, but if we keep up this pace, the consequences for our Nation's leadership role in space are dire.

China is watching our regulatory processes and chokepoints and red tape, and they're smiling. Their governance system is set up with the goal of beating the United States in the current space race. Don't get me wrong. We are not here to say get rid of part 450 for launch licensing and regulation. However, the implementation challenges with part 450 do not benefit public safety and are actively hurting our industry.

Thankfully, many of the changes that need to be made can be put in place today by AST and are concrete and actionable. For example, reinstating the independent technical authority, issuing internal guidance that puts guardrails around the endless preapplication process review, and publishing additional advisory circulars that we're asking for. I have a much longer list in my written testimony, but hopefully, that gives you a sense of some of the commonsense fixes that could be done today. Longer-term fixes are also critical, like the part 450 SpARC (Aerospace Rulemaking Committee). And finally, deploying the license application LEAP tracking tool.

From Congress, we recommend setting a statutory timeline for approving an applicant's means of compliance, continuing to provide additional resources to AST for part 450 launch and reentry licensing, and advancing pertinent sections of the *Commercial Space Act of 2023* such as the learning period extension, launch and reentry indemnification and liability extensions, and the launch and reentry streamlining provisions wisely put forward by Representatives Garcia and Stevens and approved by the Committee.

I thank the Subcommittee for the time and look forward to any questions and conversation.

[The prepared statement of Mr. Cavossa follows:]



**Testimony of David Cavossa
President, Commercial Spaceflight Federation
Before the Committee on Science, Space, and Technology's
Subcommittee on Space and Aeronautics
United States House of Representatives
Tuesday, September 10, 2024**

Chairman Babin, Ranking Member Sorensen, and distinguished Members of the Committee: Thank you for inviting me to testify on behalf of the Commercial Spaceflight Federation (CSF). I am honored to share our members' experiences and concerns with the Federal Aviation Administration's (FAA) implementation of its Part 450 launch and reentry regulations, which, without changes, could substantially reduce the pace of innovation and progress within the domestic space sector and impede national competitiveness with China. Industry shares FAA's absolute commitment to protecting public safety and is proud of its perfect public safety record. However, FAA's ability to license launch and reentry operations in a timely manner continues to rapidly degrade, contrary to federal policy requirements and pressing national need. The U.S. launch and reentry licensing process, managed by the Office of Commercial Space Transportation (AST) within FAA, can and must be better, while maintaining public safety as paramount. CSF greatly appreciates the Committee's bipartisan and timely attention to this important matter, and it is our hope for legislative action to immediately assist AST in remedying this untenable situation.

Founded in 2006, CSF is the leading national trade association for the commercial spaceflight industry, with approximately 90 member companies and organizations across the United States. CSF and its members are focused on expanding America's leadership in space, laying the foundation for a sustainable space economy, and democratizing access to space for scientists, students, civilians, and businesses. But it's not just success in orbit and beyond; we are seeing these benefits here at home. CSF members have created tens of thousands of high-paying engineering and manufacturing jobs and have invested billions of dollars across the country, revitalizing a domestic aerospace supply chain that had been in decline and unlocking new potential in space that we can bring home.

Launch and reentry operations underpin all space sectors. Nothing goes into orbit or returns to Earth without safe, reliable, and affordable access to space. That includes national security payloads, science experiments, Earth observation sensors, Global Positioning System (GPS) satellites, hypersonics, spaceport-to-spaceport transportation, and government and private astronauts. All of these space applications *depend* on commercial space transportation. These capabilities are critical to national and economic security and are the foundation for many aspects of everyday life. As launch and reentry operations increase in both cadence and diversity, we are also inaugurating new spaceports, which enhance launch infrastructure resiliency and directly benefit civil, commercial, and national security users.

After years in which the total number of American launches to space precipitously dropped—including years where the U.S. had no share of the global commercial launch market—CSF members have returned the U.S. launch and reentry sector to a dominant position. In the first quarter of this year, American companies launched more orbital rockets than all other nations *combined*.¹ But this leadership is in serious jeopardy as a direct result of AST’s continued challenges implementing Part 450. International competitors will quickly outpace American capability if these critical flaws are not meaningfully and urgently addressed. As National Aeronautics and Space Administration (NASA) Administrator Bill Nelson has noted, “It is a fact: we’re in a space race.”²

Congress and the White House have made clear on a bipartisan basis that it is a national priority to preserve our critical advantages in this domain against geopolitical rivals. But this sense of urgency must extend beyond NASA and the Department of Defense (DoD) to regulatory agencies like FAA. To be very clear, this is not a choice between maintaining public safety—which must remain paramount—and facilitating this important activity, nor is CSF advocating for any regulatory rollbacks; rather, AST must foster an appropriately structured and managed regulatory regime that can ensure both vital goals are met, consistent with the very intent of the Part 450 regulations and the Commercial Space Launch Act itself.

This Committee has played an important role contributing to the success of this industry and America’s national space enterprise as a whole by conducting oversight and shepherding legislation designed to enable the future of commercial spaceflight. But the future has caught up to us quickly, with American commercial space launches now occurring on average every 2.5 days, and with new and transformative capabilities from multiple American companies in final stages of development. We greatly appreciate the hard work of the many dedicated AST licensing staff who are doing their best day-in and day-out to keep today’s licensing system semi-functional. However, they are not being given an opportunity to succeed as a direct result of the issues inherent within the existing implementation of Part 450, the agency’s unwillingness to act with urgency to correct those issues, and ongoing staffing challenges.

CSF maintains a close dialogue with AST and regularly provides direct, actionable feedback. While AST has acknowledged that “licensing remains a ‘gate’ to space for...national priorities” and that it “has already recognized some shortcomings in the part 450 rule, as well as gaps in standards and guidance,” the office has not yet meaningfully acted to address these issues.³ Until Congress can pass legislation to resolve some of the most significant structural challenges, we continue to *strongly* encourage AST to begin acting with urgency and implement short-term stopgaps within its authority to prevent further breakdown of the licensing process. These agency actions include expediting hiring for additional technical licensing staff; revising and updating its approach to Part 450 implementation immediately; and contemplating regulatory solutions *now* through updated internal guidance, waivers, policies, and additional Advisory Circulars (ACs) as a bridge to enhance flexibility, reduce timelines, and eliminate uncertainty until Part 450 can

¹ Kühr, Jack. “2024 Q1 Orbital Launches by Country.” Payload, (May 9, 2024). <https://payloadspace.com/2024-q1-orbital-launches-by-country/>.

² Bryan Bender. “‘We Better Watch out’: NASA Boss Sounds Alarm on Chinese Moon Ambitions - POLITICO.” POLITICO, (January 1, 2023). <https://www.politico.com/news/2023/01/01/we-better-watch-out-nasa-boss-sounds-alarm-on-chinese-moon-ambitions-00075803>.

³ “Budget Estimates Fiscal Year 2025.” Federal Aviation Administration, pg. 25. (2024). https://www.transportation.gov/sites/dot.gov/files/2024-03/FAA_FY_2025_Budget_Request.pdf.

undergo a significant overhaul. In all cases, industry stands ready to collaborate with our regulator to identify consensus alternatives to the status quo.

My testimony will provide a brief overview of the history of Part 450, discuss issues that must be addressed with the regulation, and propose solutions. I strongly and respectfully ask that the Congress act with all due speed in implementing these critical reforms.

PART 450 OVERVIEW

AST created Part 450 in 2020 by consolidating four legacy launch and reentry regulation sets (Parts 415, 417, 431, and 435) into one. This effort was intended to streamline the launch and reentry licensing process, provide a performance-based regulatory framework, and allow for multi-mission licensing. Space Policy Directive-2 (SPD-2), issued in May 2018, tasked the Department of Transportation (DOT) with streamlining AST's launch and reentry regulations under an umbrella policy of ensuring "that regulations adopted and enforced by the executive branch promote economic growth; minimize uncertainty for taxpayers, investors, and private industry; protect national security, public-safety, and foreign policy interests; and encourage American leadership in space commerce." Specifically, this directive required AST to consider (1) utilizing a single license for all types of launch and reentry operations and (2) replacing prescriptive regulations that mandated specific solutions with performance-based criteria that could better encompass ongoing innovation in the industry.⁴ Industry applauded SPD-2 when it was announced and was eager to engage in the development of a streamlined regulatory framework, as reflected by the many public comments submitted when AST published its Notice of Proposed Rulemaking (NPRM).

After announcing the NPRM, FAA also chartered the Streamlined Launch and Reentry Requirements Aviation Rulemaking Committee (ARC) in spring 2018 to solicit specific, consensus industry recommendations to maximize success in a new licensing regime. In its final report, the ARC identified prioritizing performance-based and flexible requirements, reforming the pre-application consultation process, defining review timelines, and eliminating duplication in jurisdiction on Federal ranges as prerequisites for the new regulation.⁵

In April 2019, AST published the Notice of Proposed Rulemaking (NPRM) for Part 450 introducing the streamlined framework for both launch and reentry operations.⁶ FAA stated the framework was built around performance-based regulations where "operators would be able to use a means of compliance that has already been accepted by the FAA or propose an alternate approach."⁷ Unfortunately, the proposed rule did not incorporate much of the guidance included in the final ARC report. After the proposed rule was released, industry filed a comprehensive set of individual comments to the public docket to highlight the major structural and substantive concerns inherent in the draft rule and propose solutions. These concerns ultimately went unaddressed and AST promulgated the final rule in 2020.

⁴ Space Policy Directive 2—Streamlining Regulations on Commercial Use of Space (May 24, 2018), <https://trumpwhitehouse.archives.gov/presidential-actions/space-policy-directive-2-streamlining-regulations-commercial-use-space/>

⁵ 84 FR 15301, <https://www.federalregister.gov/d/2019-05972/p-180>

⁶ 84 FR 15296, <https://www.federalregister.gov/documents/2019/04/15/2019-05972/streamlined-launch-and-reentry-licensing-requirements>

⁷ 84 FR 15298, <https://www.federalregister.gov/d/2019-05972/p-152>

Part 450's inherent defects were evident from day one: not only are processes and procedures *not* streamlined, they are unclear, lack clarity of intent, are subject to differing and often conflicting interpretations, and are substantially slower to go through and more constraining on innovation and operational tempo than legacy regulations. The structural issues with Part 450 are being compounded by implementation challenges that are getting worse, not better, with time. AST has the power today to make positive change but has not yet meaningfully acted to do so.

The many concerns industry raised in its public comments have come to fruition in every stage of the AST licensing process, outlined below:

1. The AST licensing process begins with licensee pre-application consultation.
2. Once means of compliance, or methodologies, proposed by the operator are approved by AST, the licensee documents all supporting license application material. This documentation serves to verify an operator adhered to their proposed means of compliance and complies with the AST's risk criteria.
3. Once review is complete, AST grants a license with any terms and conditions unique to the operation and launch or reentry vehicle. Alternatively, AST may deny a license application.

As it stands, AST's management of Part 450 has led to significant delays in each of these phases. For example, while Part 450 was designed to authorize a set of multiple missions on a given vehicle to reduce licensing burdens on both the government and industry, AST continues to focus on single-mission licenses for launch and reentry operations. Even for these single-mission licenses, confusion about the regulation, driven by insufficient guidance and inconsistent interpretation, prompts continuous license modifications, which arrest the complex technical tasks associated with launch and reentry vehicle development and testing.

By law, FAA must provide licensing determinations within 180 days; however, *every single license* issued under Part 450 has significantly exceeded this requirement, some by years, in part due to the mandatory pre-application period, which AST has determined is not subject to the 180-day statutory licensing time period.⁸ It is unreasonable for licensing to be more time consuming than developing and testing rockets. Ironically, FAA's performance under the legacy regulations Part 450 was intended to replace has improved in recent years, but this improvement has not extended to Part 450 and will be erased once the prior framework is sunset in 2026.

Critically, while AST's implementation of Part 450 is unacceptable today, this failure—and by extension, its negative impacts on launch and reentry operators and their public and private sector customers—will soon get much worse. When AST published Part 450, it created a 2026 deadline for all companies operating under the existing legacy rules to transition to Part 450. Many legacy operators are today choosing to operate under the old regulatory framework for as long as they can because, despite expending significant resources in preparation for the transition to Part 450, industry faces too much uncertainty and too many obstacles with Part 450 license implementation. Over the next year and a half, AST's deadline for transition will cause a regulatory pile-up that

⁸ Continuing U.S. Leadership in Commercial Space at Home and Abroad: Hearings before the Full Committee Hearing of House Science & Space Technology Committee, (2023), (testimony of Caryn Schenewerk). <https://www.commerce.senate.gov/services/files/563D7730-7FAD-426E-A08B-D6E3068A17D5>

may ground currently flying U.S. space systems, disabling U.S. access to space as a result of incoherent regulations, poor implementation, and insufficient staffing.

PART 450 CHALLENGES

AST must be willing to act to implement necessary regulatory and internal process changes to address the primary issues with Part 450, outlined below.

Lack of Advisory Circulars (ACs)

ACs are important and necessary FAA tools that complement regulations by providing guidance on the FAA's interpretation of a regulation and the level of detail expected to demonstrate compliance. FAA may also publish ACs to provide technical clarifications to regulations. However, after Part 450 was published in December 2020, AST has fallen behind on its commitments to issue ACs. For example, after attaching a single draft AC to the final rule, AST did not release its first AC until July 2021.⁹ Recognizing the need to move faster, AST published a website in 2021 that included a schedule showing the vast majority of ACs would be released by the end of 2022. AST ultimately did not publish most of those ACs and has since removed the schedule from the website.¹⁰ At FAA's Commercial Space Transportation Advisory Committee (COMSTAC) meeting in April of this year, AST announced 12 additional ACs would be published in 2024. As of today, AST has published two minor updates to previously implemented ACs and only one new AC.¹¹ AST also makes no announcement when ACs are published; operators must manually and frequently check AST's website to see if a new AC has been published.

And so, nearly four years after the Part 450 rule was issued, AST has not published a complete set of ACs. In fact, AST has issued *fewer than half* the ACs that AST itself said would be required for a Part 450-based licensing process to operate effectively. Much of the guidance AST has issued simply advises operators to fall back means of compliance previously included in the legacy regulations, defeating the entire purpose of Part 450's performance-based regulatory model.¹² As COMSTAC noted, this practice of relying on legacy means of compliance has led to "the [Part 450] review process [driving] applicants toward strict requirements and, in some cases, placing limits on their operations with no public safety benefit."¹³ In essence, AST has reverted to the worst parts of the previous prescriptive regime while adding additional steps and time and disincentivizing novel approaches to vehicle design, operations, and flight safety.

The Part 450 final rule repeatedly recognizes the need for clear guidance in order to understand and comply with regulatory requirements and states FAA "will provide" an AC on a given regulatory requirement in order to "provide an approach to compliance," but has not yet done so

⁹ 14 CFR Part 450 Subpart C Accepted Means of Compliance Table,

https://www.faa.gov/sites/faa.gov/files/Part_450_Means_of_Compliance_Table%20v3%206_24_2024.pdf

¹⁰ "Part 450: Means of Compliance Table." Federal Aviation Administration, <https://www.faa.gov/space/streamlinedlicensingprocess/part-450-means-compliance-table>

¹¹ AC No: 450.101-1, updated on May 3, 2024, https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_450.101-1B.pdf; AC No: 450.139-1, published on July 8, 2024, https://www.faa.gov/documentLibrary/media/Advisory_Circular/450.139-1.pdf

AC No: 450.115-1B, updated on August 2, 2024, https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_450.115-1B.pdf

¹² Of the 43 technical requirements of Part 450, only 16 Advisory Circulars are published

https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document/list?&appliedFacets=%7B%22officeNumber%22%3A%22AST-1%22%7D

¹³ COMSTAC Regulatory Working Group Report: Part 450 -- Challenges and Recommendations, (July 11, 2023), <https://www.faa.gov/media/68016>

in many cases.¹⁴ In addition to failing to deliver a complete set of ACs—the minimum AST acknowledged was required for Part 450 to function—AST has also not prioritized releasing ACs to clarify the most complex or new requirements within Part 450 that contribute to the biggest delays in timely license approval.

Furthermore, AST is missing basic guidance for Part 450 that would otherwise enable a more efficient licensing review process. For example, AST has a requirement where a “licensee is responsible for the continuing accuracy of representations contained in its application for the entire term of the license.”¹⁵ However, this requirement is vague and leaves significant gaps for interpretation. Without guidance in place, AST has defaulted to assume *any* change in a detail of the proposed operation under Part 450 requires a formal license modification, even those that have zero impact on public safety and are minor by definition. This places an unnecessary burden on AST staff and operators as even the most reasonable license update requires a formal modification, which in turn adds additional schedule in the form of a modification letter request, formal AST review and concurrence, and new license revision. AST simply does not have the capability to keep doing this without major schedule impacts for all operators. It also runs counter to AST’s goal of issuing multi-mission licenses for similar operations.

In the absence of ACs, there is little ability for productive and consistent conversation surrounding an operator’s proposed means of compliance. With no centralized anchor, the process leads to unlimited and continuing requests for information by AST, resulting in a vicious circle of iteration and unbounded feedback loops with no clear goals. In many cases, this has made submitting a fully complete application to AST in a first attempt functionally impossible for both new and established operators.

Equally as important is continuous improvement and revision of ACs. The goal of a performance-based regime is to continually expand the envelope of potential means of compliance. As additional Part 450 license applications are reviewed and approved, a sign of a healthy regulatory framework would be the addition of alternative means to an AC on a regular basis. Lessons learned from each effort can help build out a menu of options that enable innovation. Reviewing, synthesizing, and publishing updates and alternatives should be actions that are tracked and used as success metrics for the Part 450 regime overall.

Reluctance to Accept Novel Means of Compliance

Further complicating the situation, AST’s published ACs are not intended to be the only exclusive option for demonstrating compliance with Part 450 requirements. Part 450 specifically establishes that each AC “presents one, but not the only, acceptable means of compliance with the associated regulatory requirement.”¹⁶ Indeed, the flexibility to allow novel means of compliance was fundamental to Part 450’s intent and industry widely supports the concept. This flexibility in approach to solving highly complex and uncertain problems *should* enable operators and AST to determine new compliance methodologies to unlock the benefits of performance-based regulations while improving public safety, encouraging ongoing innovation, and providing a more efficient path for new vehicle licensing.

¹⁴ 85 FR 79566, <https://www.federalregister.gov/documents/2020/12/10/2020-22042/streamlined-launch-and-reentry-license-requirements>

¹⁵ 14 CFR 450.211, <https://www.ecfr.gov/current/title-14/section-450.211>

¹⁶ AC No: 450.123-1, https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_450.123-1_Population_Exposure_Assessment_2022.pdf

While this option for novel means of compliance makes great sense in theory, AST has been unable to make it work in practice. Indeed, AST's *implementation* of this element of Part 450 has added bureaucracy, cost to both operators and FAA, uncertainty, and time needed to complete the licensing process. In the cases where AST has not published necessary ACs to provide guidance to prospective licensees, the office treats "means of compliance" documents that applicants submit as wholly novel and requires a series of iterative reviews, each recursively adding time. In the cases where there is an existing AC, if an operator deviates from that published AC in *any* way to tailor its compliance approach to its specific vehicle or operations, AST considers the entire approach a "unique means of compliance." This drastically increases approval timelines, even if the operator utilizes most of an AC's guidance.

This problem is further compounded because AST has not issued formal guidance on the definition of what a "means of compliance" is or what constitutes sufficient information for the office to concur with or reject a proposed analytical approach. This is a fundamental failure of the system. While appropriate and thorough reviews are reasonable and necessary, AST frequently requires applicants to justify their new means of compliance to such an extreme and unreasonable level of irrelevant detail that the approach is no longer universally applicable to their operations beyond the singular mission in question—fundamentally precluding the multi-mission licenses Part 450 was designed to enable.

Additionally, AST divides technical reviews into stovepiped categories of Flight Safety, System Safety, and Flight Safety Systems, but does not have a formal process established to foster internal information flow between these reviews. There is no person within AST responsible for overseeing all technical reviews for a license application. This breakdown inhibits AST from holistically understanding an operator's overall means of compliance strategy across these technical categories throughout the process, contributing to inefficiency.

Finally, AST's feedback throughout the review process is neither consistently clear nor timely. AST routinely provides feedback late. If an operator wishes to discuss the feedback, counter it, or provide alternate means to address it, AST often states this type of back-and-forth collaboration—again, the purpose of Part 450—would increase its license finalization timelines, strongly discouraging continued dialogues to improve efficiency and public safety. Further, operator success in proposing novel means of compliance can be entirely reliant on the specific resource or resources assigned. Operators have reported changing guidance when the primary point of contact for a certain means of compliance changes. With each key technical resource fully consumed with their own activities it can be difficult to leverage the power of multiple points of view to help arrive at optimal, safe conclusions. As with many of the other issues I outline, this practice appears driven by a continued lack of internal AST understanding of *how* to conduct licensing under Part 450 and could be solved by clear guidance from AST leadership.

FAA Staffing and Resource Challenges

These challenges and delays are further exacerbated by AST resource constraints and the diversion of limited resources to irrelevant distractions. To meet the current demand for licensing—let alone match the cadence of industry growth—AST must be sufficiently staffed with appropriate expertise to review technical aspects of license applications. CSF has long advocated for more

resources for AST to complete its public safety licensing mission and appreciates that Congress has consistently increased funding levels for AST. However, more money is not a silver bullet for solving this situation, and it has become clear that funding is not the primary driver for AST's most pressing issues.

AST is chronically understaffed, in part due to ongoing slowness inherent in FAA's hiring practices. AST requires highly qualified engineers to appropriately understand submitted licensing materials, but I have heard anecdotally that many such qualified applicants are lost to other opportunities while FAA's bureaucratic and cumbersome hiring practices churn over many months, even when AST has sufficient funds to hire the required number of reviewers and has extant expedited hiring authority. Without these qualified applicants, AST's challenges will continue.

Additionally, the team assigned to review license applications is also responsible for developing ACs, creating an internal conflict. Given AST's staffing posture, the office is in the difficult position of deciding how to allocate resources to minimize licensing delays today versus producing new ACs, drafting policies, and evaluating methodologies that will minimize licensing delays in the future. Practically, this situation has limited the office's ability to process license materials in parallel, resulting in lengthy sequential processing that impacts an operator's development and test efforts. AST has such minimal bandwidth that it is unable to complete new license approvals and modifications while concurrently evaluating proposed methodologies to meet future licensing needs under Part 450.

Perhaps most concerning, AST is devoting vital resources, including new technical hires desperately needed for launch and reentry license evaluations, to explore new areas of activity clearly outside of its statutory authority, like mission authorization, and on ramping up expertise on occupant safety despite the recent repeated extensions of the learning period. AST should be dedicating its resources to licensing while it works through these issues with Part 450 implementation. As this Committee rightly established in the Commercial Space Act of 2023, AST must effectively meet its existing responsibilities before it can consider future mission expansions and should not allow competition for authority with other federal agencies to impede its core responsibilities. Instead, AST must seek to find creative ways to optimize and increase efficiency of its core licensing functions, including adjusting its approach to licensing based on the maturity of a launch or reentry system and operator. AST should focus on post-flight audits of licensing material for mature systems and operations. This would minimize time spent on recurring pre-flight bureaucratic activities and open AST's resources to other license reviews, including for new entrants to the marketplace. This approach would also lend itself to use of Delegated Authorities, which would delegate validation of compliance to an outside technical authority, as utilized within the aviation industry, to increase the availability of AST staffing for more critical work.¹⁷

Lack of Transparency Regarding Timelines and Status

Congress wisely implemented a statutory deadline for AST to review and make determinations on launch and reentry licensing applications. AST has 180 days following acceptance of the

¹⁷ "Delegated Organizations," Federal Aviation Administration, https://www.faa.gov/other_visit/aviation_industry/designees_delegations/delegated_organizations.

application to approve or deny an application. However, AST has not consistently met this requirement for licenses within Part 450.

This problem is compounded by difficulties with the “pre-application” process. As noted above, AST can take months—if not years—to approve an applicant’s methodologies submitted as means of complying with the rule. This pre-application process gates FAA’s determination that an application is “complete enough” to proceed. FAA internal policy dictates that actions relating to applications not deemed “complete enough” are a part of the pre-application consultation process and do not count against the statutory 180-day review period. In many cases, these determinations that an operator’s application is “not complete enough” are the direct result of confusion resultant from Part 450’s deficits and AST’s lack of published guidance. Further, in limited cases, AST has told applicants that a means of compliance is approved, only to demand, post-facto, additional information for further adjudication, resulting in further delays in the process. This practice is entirely unreasonable.

Because of the previously discussed staffing and resource issues at FAA, the industry understands that FAA has implemented a priority system, working to get the most urgent licensing tasks completed. While prioritization is likely necessary and not inherently incorrect, industry is often not aware of where it sits in this lineup and it is clear that the closer a project launch date gets, the more likely an applicant is to move up in priority. The reliance on pre-application as a gate is further flawed when this reality is taken into consideration. An applicant may find it difficult to receive early feedback and approvals on a means of compliance until it has a full application submitted, a prospective launch scheduled, and becomes a higher priority—at which point it is too late to comfortably iterate the way the FAA prefers to work.

Beyond the broken schedule, applicants typically have extremely limited insight into where their applications are in the process, leading to even further uncertainty. AST has often not granted a license until just a few short days prior to a planned launch or reentry date—or even the day before. Operators cannot appropriately plan for launch and reentry operations in such an opaque system, and it adds burden to other Government agencies with responsibilities relating to a launch, including the DoD or NASA range, FAA’s Air Traffic Organization (ATO), the U.S. Coast Guard, and more.

CSF appreciates that AST has recognized this problem and is developing an online clearinghouse called the License Electronic Application Portal (LEAP) intended to allow for real-time tracking of application status. Once implemented, it is our hope that LEAP will be a productive step forward, though it will not address the fundamental issues with Part 450. LEAP’s readiness date has been delayed for years and it is unclear when it will become operational. AST also has not issued a solicitation of requirements for industry to respond to, which is concerning as user testing should be prioritized. As AST has developed LEAP, industry has uniformly urged the office to leverage proven, commercially-available software (e.g., Jira) instead of a bespoke, in-house solution that AST can ill-afford given the urgent need to accelerate information sharing, better enable performance tracking, and enhance overall communication. To date, AST has not pursued this path, creating a continued risk that basic tracking, performance metrics, and information sharing tools are not efficiently deployed.

Reentry-Specific Challenges

Consolidating various regulations into a single launch and reentry rule has benefits, but AST's implementation in this case has created additional challenges for reentry operators whose activities are simply different from launch operators. A reentry mission envelope is distinct from a launch operation and accordingly, some requirements for launch operators are not appropriate or applicable to reentry operators.

Specifically, as implemented in Part 450, the new requirement to use "conditional expected casualty" (CEC) creates an unreasonably high barrier for many reentry operations being conducted today, including missions from the International Space Station (ISS) for NASA. AST previously utilized CEC to measure relative risk between two vehicle trajectories and to demonstrate safety in waivers under the prescriptive legacy regulations. However, Part 450 codifies use of CEC as the *only* acceptable means to demonstrate high consequence event protection for reentry operations. While CEC is one possible measure of risk to the public, it is inappropriate to apply to reentry operations because it does not account for the likelihood of vehicle failure and assumes a vehicle is equally likely to fail at every stage of flight. This assumption is contrary to longstanding engineering practice, including at NASA. Historically, reentry operations for both Government and commercial operations consider and require high vehicle reliability given necessary trajectories overflying the public to landing locations like Kennedy Space Center or offshore sites in the Gulf of Mexico or Atlantic Ocean. And because reentry operations are not always dependent or connected to launch infrastructure, reentry operators are utilizing or are planning to utilize in the future other locations, such as Department of Defense test ranges. These types of operations may not be feasible under Part 450 without altogether waiving the CEC requirement. No matter how reliable, only a subset of reentry operators can meet CEC requirements for these typical reentry trajectory designs, as industry noted in comments to the draft Part 450 rule years ago.¹⁸ FAA recognized this possibility in its final published rule, noting that the CEC requirements establish a potential barrier and states that a reentry "operation would either need to be modified to reduce the consequence of failure modes that would result in an intact impact, or be granted a waiver."¹⁹ Yet, this requirement was still included in the final rule. Unsurprisingly, this decision is causing major challenges to operators and AST today, and by extension, NASA's human spaceflight program.

CEC is one of many examples of where AST did not differentiate between launch and reentry operations when it should have.²⁰ Other aspects of Part 450 reduce flexibility for reentry operations where launch operations are not similarly constrained. For example, AST provides four hazard control strategies that theoretically could be used for both launch and reentry operations, but in practice only one of these applies to reentry operations.²¹ Further, in the few ACs published, rarely are differences in acceptable means of compliance between launch and reentry operations

¹⁸ Blue Origin Part 450 NPRM comments, <https://www.regulations.gov/comment/FAA-2019-0229-0104>; Sierra Nevada Part 450 NPRM comments, <https://www.regulations.gov/comment/FAA-2019-0229-0145>; Commercial Spaceflight Federation Part 450 NPRM comments, <https://www.regulations.gov/comment/FAA-2019-0229-0150>; SpaceX Part 450 NPRM request for clarification, <https://www.regulations.gov/comment/FAA-2019-0229-0120>; Sierra Nevada Part 450 NPRM request for clarification, <https://www.regulations.gov/comment/FAA-2019-0229-0100>

¹⁹ Footnotes to 14 CFR Parts 401, 404, 413, 414, 415, 417, 420, 431, 433, 435, 437, 440, 450, and 460, <https://www.federalregister.gov/documents/2020/12/10/2020-22042/streamlined-launch-and-reentry-license-requirements#footnote-59-p79601>

²⁰ 85 FR 79566, <https://www.federalregister.gov/documents/2020/12/10/2020-22042/streamlined-launch-and-reentry-license-requirements>

²¹ 14 CFR 450.107, <https://www.ecfr.gov/current/title-14/chapter-III/subchapter-C/part-450#450.107>

discussed. For instance, in AC 450.107-1, AST provides a sample flight hazard analysis matrix for launch vehicles but not reentry vehicles.²²

Finally, a recent AST policy announcement applies an additional burden for reentry operators.²³ The policy requires reentry operators to obtain a reentry license prior to launch, even if that reentry will not occur until months or years later. This is overly burdensome as it requires operators to undergo the payload review process with their launch provider in parallel with their reentry licensing effort and is compounded by AST's ongoing delays. The policy cites safety concerns for reentry vehicles without reentry licenses at the time of launch. In Section (IV)(2), the policy states "a random reentry of a reentry vehicle that has not been authorized will likely result in risks above those accepted for FAA licensed-reentry operations."²⁴ This overly broad assumption does not fairly characterize all reentry capsules, which are greatly varied throughout industry. The policy also relies on a different set of assumptions than the Federal Communications Commission—one of many examples of a lack of coordination between government agencies that complicates the licensing process.²⁵ Broad application of this policy is not appropriate for all reentry vehicles and will unnecessarily hinder the growth of the small reentry vehicle market in the United States. For these reasons and more, AST must clarify the differences in applicability of certain requirements to launch and reentry operators and provide for pathways to additional, executable means of compliance. Reentry operations are a vital segment of the space economy and need regulatory clarity and certainty.

Range Coordination

Today, launch and reentry operations involving and/or adjacent to a DoD and/or NASA operated range sometimes require safety analyses conducted by both the DoD/NASA and AST, leading to duplication of effort, confusion, and conflicting requirements imposed on operators. At times, operators have their analyses approved by AST, only to later be rejected by the range—or vice versa. The reality is that Part 450 has reduced clarity on the interactions between NASA, DoD, and AST despite policy guidance. For example, Part 450 allows operators to procure Federal services such as risk analysis evaluation. However, Part 450 also requires specific means of evaluating risk that upend standard approaches to flight safety analysis or operational processes currently utilized by NASA and/or DoD. These conflicts place operators in a difficult position between AST's licensing requirements and the expertise of NASA and DoD personnel.

This interagency conflict does not serve to promote public safety. AST, NASA, and DoD must work together to find a way to eliminate duplicative requirements and harmonize their operations. Importantly, AST can act *unilaterally* to solve much of this challenge. Specifically, CSF strongly supports a COMSTAC recommendation that AST accept the flight safety analysis performed by a Federal range operated by the United States Space Force (USSF).²⁶ AST should also similarly

²² AC 450.107-1 - Hazard Control Strategies Determination,

https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document/information/documentID/1040123

²³ FR Doc. 2024-08156, (Filed April 16, 24), <https://www.federalregister.gov/documents/2024/04/17/2024-08156/launch-of-a-reentry-vehicle-as-a-payload-that-requires-a-reentry-authorization-to-return-to-earth>

²⁴ FAA Notice (89 Fed. Reg. 27473) <https://www.federalregister.gov/d/2024-08156/p-22>

²⁵ 47 CFR 5.64(b)(7)(iv)(B)(2), <https://www.law.cornell.edu/cfr/text/47/5.64>

Requirement 4.7-1 of NASA-STD-8719.14A, https://soma.larc.nasa.gov/SIMPLEx/pdf_files/871914.pdf

²⁶ COMSTAC Regulatory Working Group Report: Part 450 – Challenges and Recommendations, (July 11, 2023), <https://www.faa.gov/media/68016>

accept NASA flight safety analysis. USSF and NASA should also consider when it is appropriate to simply accept AST flight safety analysis.

The safety of the uninvolved public is of the utmost importance, but conflicting and uncoordinated safety analyses performed between Government agencies do not enhance public safety. Without action, many within industry may look to operate at the ranges of foreign U.S. partners.

Congress has long agreed with the need for licensing efficiency on a bipartisan, bicameral basis. For example, the Commercial Space Launch Competitiveness Act of 2015 stated that “eliminating duplicative requirements and approvals for commercial launch and reentry operations will promote and encourage the development of the commercial space sector.”²⁷ The Space Frontier Act of 2019 directed DOT to “make more efficient use of resources, reduce the regulatory burden for an applicant for a commercial space launch or reentry license or experiment permit, and promote commercial space launch and reentry.”²⁸

PROPOSED SOLUTIONS

As I have made clear, AST’s challenges in developing and now implementing Part 450 are not only harming the commercial space industry, but directly inhibiting key national space priorities, including the Artemis Program to return Americans to the Moon, by introducing significant schedule delays. AST must resolve these issues for the U.S. to maintain its leadership in space. Thankfully, there are clear solutions, some of which are already in motion. We ask the Committee to support the steps laid out below and provide appropriate oversight to ensure they are carried out expeditiously.

- **While AST must undertake a long-term structural review of Part 450, such a process would take years, at best. Accordingly, Congress should direct AST to undertake immediate, interim steps to prevent a complete breakdown of launch and reentry licensing in the intervening time, including:**
 - Issue internal guidance that appropriately defines the current process, constrains endless iteration and review, and requires rationale associated with information requests;
 - Appoint an Independent Technical Authority to oversee and manage technical discussions, rather than having all technical discussions stovepiped into various branches. Today, no single branch within AST is responsible for an *outcome*. They are only individually responsible for their own piece. A specific person must be responsible for the whole product;
 - AST must immediately remove itself from ground safety matters when these activities within a license are approved by USSF or NASA (or vice versa) to reduce resource burden on AST and to eliminate conflicting interagency guidance;
 - AST must implement commercially-available information sharing software (e.g., Jira) today instead of spending its and licensees’ time and money pursuing a bespoke solution;

²⁷ “Text - H.R.2262 - 114th Congress (2015-2016): U.S. Commercial Space Launch Competitiveness Act.” November 25, 2015. <https://www.congress.gov/bills/114/congress-house-bill/2262/text>. <https://www.congress.gov/bills/114/congress-house-bill/2262/text>

²⁸ “Text - S.3277 - 115th Congress (2017-2018): Space Frontier Act of 2019.” December 21, 2018. <https://www.congress.gov/bills/115/congress-senate-bill/3277/text#toc-ide2f6cf33-d3cb-4df8-86fc-1891e83d6ca2>

- AST must accelerate hiring appropriate technical staff for licensing evaluations consistent with its statutory mandates and appropriations;
 - AST must consider Delegated Authority, which delegates regulatory compliance verification to outside technical authorities, to increase AST resource bandwidth on critical licensing issues;
 - AST must defer much of its review to post-flight audits and inspections for mature, operational launch systems to increase its bandwidth for developmental programs and to relieve AST resources from recurring bureaucratic licensing work that does not affect public safety;
 - AST must immediately clarify what constitutes a license modification versus continuing accuracy and minimize reviews for non-substantive license updates that do not affect public safety;
 - FAA must rapidly publish ACs, including an AC specific to reentry vehicles or updates to currently published ACs that denote where requirements should be interpreted or met differently by reentry operations;
 - FAA must rapidly communicate to Congress if it needs additional hiring authorities to expeditiously address staffing needs, such as authorization to utilize direct hiring authorities under section 3304 of Title 5, United States Code.
- **Advance the learning period extension, launch and reentry indemnification and liability extensions, and launch and reentry streamlining provisions of the Commercial Space Act of 2023.** Extending the human spaceflight learning period will keep AST focused on executing its core public safety licensing responsibilities and fixing Part 450 until the appropriate time comes to revisit the commercial human spaceflight safety framework. Additionally, Congress should extend key authorities underpinning the indemnification and liability regime for launch and reentry operations, including 51 USC 50914(a)(5), 51 USC 50914 (b)(1)(C), 51 USC 50915(a)(3)(B), and 51 USC 50915(f). Finally, the bipartisan Garcia-Stevens amendment adopted by voice vote during Committee markup includes reasonable, but highly impactful authorities and guidance for AST that will significantly improve licensing performance, while continuing to protect public safety.
 - **Set a statutory timeline for approving applicant means of compliance.** There needs to be a shot clock and transparency on the timeline for work done in the pre-application phase to approve means of compliance. Namely, AST should be required to provide all feedback on an applicant's means of compliance within 30 days to add predictability and consistency to the process.
 - **Provide increased, focused resources to AST to emphasize launch and reentry licensing and timely publication of ACs.** AST is currently understaffed and under resourced. While resources are not the sole—or even leading—cause of AST's challenges, ensuring it has enough money and sufficient qualified engineers for licensing activities is one concrete step Congress can take to support fixing Part 450. I commend Congress for approving an increase in appropriations to AST in FY24 and urge a repeat in FY25 with direction that keeps AST focused on its core public safety licensing responsibilities.

- **Encourage DOT to rapidly establish the Part 450 Aerospace Rulemaking Committee (SpARC).** AST recognizes that Part 450 is broken and announced its plans for a Part 450 SpARC in February 2024.²⁹ CSF appreciates this step, as it will serve as a vital opportunity for industry to engage with AST on the components of Part 450 that need to be fixed. However, six months after this announcement, DOT has not yet acted to formally establish this effort for AST. Congress should direct DOT and AST to formally and immediately establish the SpARC. Since a SpARC process can take years to complete its work, DOT and AST must start this process now to avoid further delay. Congress should also urge AST to ensure the SpARC membership is solely composed of individuals impacted by the regulation to maintain appropriate operational focus. Finally, AST should collaborate with the SpARC in every step of the regulatory development and review process.
- **Encourage the rapid rollout of the LEAP online portal by leveraging commercial tools.** This will provide additional transparency to applicants by allowing for real-time updates on application status. This should be industry facing as well, allowing industry to track metrics and responses openly with the FAA.
- **Accelerate FAA environmental reviews.** Beyond evaluating launches and reentries for public safety, AST also performs environmental compliance reviews, which are often the longest lead item in the licensing process.³⁰ As part of this effort, AST coordinates with multiple other consulting government agencies, many of which have limited to no familiarity with space operations or space infrastructure. In many cases, this disconnect adds significant schedule while both AST and industry extensively engage each time to share information and educate these other authorities. Given the national schedule urgency for space projects, FAA must accelerate this process, while ensuring an appropriate level of environmental oversight. FAA has a clear model that it can immediately implement. As an agency, it has long recognized the vital national importance of airports and has identified significant airport elements, including runways, passenger terminals, and more, as qualifying for a Categorical Exclusion (CATEX) under the National Environmental Policy Act (NEPA).³¹ FAA should extend this existing determination to accelerate space infrastructure buildout for the same national security and economic benefits. Importantly, the Commercial Space Act of 2023, as amended, would direct FAA to apply this authority.

CONCLUSION

The commercial space industry is vital to the lives of everyday Americans as well as our nation's economic competitiveness with China. I thank the Committee for its work on and attention to this important topic.

²⁹ Meeting the Demand for Space Launch and Reentry Licenses, Federal Aviation Administration, <https://www.faa.gov/newsroom/faa-meeting-demand-space-launch-and-reentry-licenses>, <https://www.faa.gov/newsroom/faa-meeting-demand-space-launch-and-reentry-licenses>

³⁰ 14 CFR 450.47(a), [https://www.ecfr.gov/current/title-14/part-450/section-450.47#p-450.47\(a\)](https://www.ecfr.gov/current/title-14/part-450/section-450.47#p-450.47(a))

³¹ Categorical Exclusions, n.d. <https://www.faa.gov/airports/central/environmental/catex>.

Dave Cavossa

CSF

President



Dave Cavossa is President of the Commercial Spaceflight Federation (CSF), officially joining on June 3, 2024. Mr. Cavossa is a long-time space and satellite industry executive working at the intersection of commercial space, government affairs, and government services. Cavossa also was bitten by the entrepreneurial bug in 2015 and started his own tech startup in the golf industry which he built, funded and sold recently to a competitor before moving back into Space industry. In addition to building his own Space 2.0 Consulting LLC, Dave was most recently lead for the U.S. government business at Agility Beyond Space (ABS) – a GEO FSS Satellite operator based in Dubai.

Dave likes to think he has seen the space industry from every perspective – government employee, sales and business development executive, operations manager, P&L owner, startup founder, consultant, and now 2 x time trade

association leader. Throughout his career in the space and satellite industry Mr. Cavossa has held various leadership and staff-level roles. At the Satellite Industry Association (SIA) he served for 6 years as Executive Director and Chair of the Board. He also served in various executive roles with multiple satellite/defense contractors including Harris Corporation, CapRock Government Solutions, and Arrowhead Global Solutions. Mr. Cavossa also began his career in 2001 at NASA Headquarters in D.C., as an intern, working in the Legislative Affairs and International Relations offices.

Mr. Cavossa was a Space Policy Fellow and holds a Master's Degree in Science, Technology, and Public Policy from The George Washington University Space Policy Institute. David completed an Exec Certificate Program in Business and Strategic Marketing from Northwestern University. David also obtained his Bachelor's Degree in Physics, Astronomy, and Political Science from Wheaton College, in Massachusetts.

Mr. Cavossa lives in Warrenton, VA with his wife Ashley Basquin-Cavossa – a fellow trade association executive who leads political affairs for the Investment Company Institute (ICI) in D.C. They have two boys – Langdon (14) and Barrett (10) who keep them on travel baseball and flag football fields literally every week and weekend for 48 weeks a year.

Chairman BABIN. Thank you, Mr. French.
 Now, I'd like to—oh, excuse me. Thank you, Mr. Cavossa.
 I'd like to recognize Mr. French for 5 minutes to present his testimony.

**TESTIMONY OF MR. MIKE FRENCH,
 FOUNDER, SPACE POLICY GROUP, AND VICE CHAIR,
 FAA COMMERCIAL SPACE TRANSPORTATION
 ADVISORY COMMITTEE**

Mr. FRENCH. Thank you, Chairman Babin.

Chairman BABIN. Yes, sir.

Mr. FRENCH. Chairman Lucas, Ranking Member Lofgren, Ranking Member Sorensen, Members of the Subcommittee, thank you for the opportunity to testify today.

I serve as the Vice Chair of the FAA's advisory committee COMSTAC (Commercial Space Transportation Advisory Committee), and my testimony today will reflect my personal assessment of the activities from that committee, as well as my activity in the space community at large.

I want to leave you with three main points today, around safety and growth, around resources, and around current regulatory challenges. I'll start with safety and growth.

The space industry, the launch industry particularly has seen tremendous growth after—over the last decade. There's been an over 1,500 percent increase in the number of licensed launches, over \$28 billion invested in the U.S. space industry, and the development and establishment of several new companies and multiple launch vehicles.

Throughout this tremendous growth, the United States has maintained a 100 percent public safety record. Now, that doesn't mean that we don't have incidents, and some of them are quite spectacular, and some of them may seem dangerous to the public, but those incidences are not evidence of a regulatory problem, just the opposite. They evidence the success of the regulations in keeping the public safe, which is their purpose. And for that, Mr. Coleman and AST team really deserve, you know, recognition.

And that takes me to my second point, which is resources. This growth is not without consequences. While we've seen that tremendous growth in the launch industry, AST's budget has only grown at 10 percent of the rate of that launch increase. AST staffing has only grown at 5 percent of the growth of that licensing increase. And this has created a real burden on the licensing process. Today, AST has to prioritize among active applications, and it is impacting not just the licensing process that's active, but also the development of new guidance and the development of new tools that could help the process writ large.

From a COMSTAC perspective, AST's funding has been a concern for several years now. From a congressional perspective, Congress should be commended for the actions that have been taken this year at the House and Senate Appropriations Committee with marks that support AST's full request, including a significant increase for licensing staff.

This takes me to my third point, which is regulatory challenges with the implementation of part 450. The safety record we just

talked about, that has primarily taken place under the old set of regulations or the legacy regulations. This is being replaced by the framework of the part 450 regulations that we've been talking about today.

These challenges have been a significant concern to the COMSTAC and COMSTAC membership. Over the last 2 years, we've sent several recommendations to AST on this, including a detailed set of recommendations last year providing changes in the implementation process and some of the regulations at our—at a specific regulatory level.

I'll highlight three areas in particular for these concerns where I think Congress can help out. The first one, what was mentioned before, is the 180-day shot clock, if you would, on the time to complete a regulation. Under the part 450 framework, the 180-day framework has lost some of its effectiveness with significant time being spent in what's called preapplication before the clock starts running.

I propose that Congress should keep the time limit, but think of a new clock, what I'll call a chess clock instead of a shot clock. Under this system, the clock will start when the preapplication process begins, but then it will run depending on who has possession of application as it goes through the process. This type of chess clock, matched with the transparency tools in our development, should provide more transparency to both applicants, AST, and to the Congress, and give a much clearer and more accurate picture of what's going on throughout the process.

A second area we've heard a concern is on advisory circulars. These are FAA-produced documents that provide a means of compliance to the new regulations. As operators and AST have been contending on how to meet the new regulations, this has increased the importance of these advisory circulars. However, new—developing new advisory circulars suffers from the same resource problem we talked about before, where the same staff that is responsible for licensing also is needed to complete the advisory circular, creating a bottleneck to choose to solve the problem today or help solve the problem tomorrow.

Congress here has the opportunity to help out as well. If we think about those legacy regulations, which is responsible for that safety record that is—that we talked about, Congress could consider allowing operators to use the legacy regulations in those areas where advisory circulars are still under development and give time for the FAA to then provide that guidance under the 450 framework.

A third area of concern where Congress can take action is what Mr. Cavossa mentioned in multiple or duplicative safety analysis being provided by AST and by the ranges. In this area, Congress could take action to allow operators to choose whether the AST or the range's activity analysis to meet the regulations.

Finally, I'll end with a possible growing area of concern, which is an environmental regulatory framework. FAA launch licenses are subject to *NEPA* (*National Environmental Policy Act*) review. With the growing number of launches, the growing number of launch locations, there's the potential to see a lot more activity and challenges to the FAA environmental review process that is—that

occurs in other sectors, but space has generally been left out of. With this, it's another area of further exploration of Congress.

And so with my comments on safety and growth, additional resources, and these regulatory fixes, I thank the Subcommittee for the time today and the opportunity to testify. Thank you.

[The prepared statement of Mr. French follows.]

Testimony of Mike French
Founder, Space Policy Group and
Vice Chair, FAA Commercial Space Transportation Advisory Committee¹
before the
Subcommittee on Space and Aeronautics
Committee on Science, Space, and Technology
U.S. House of Representatives

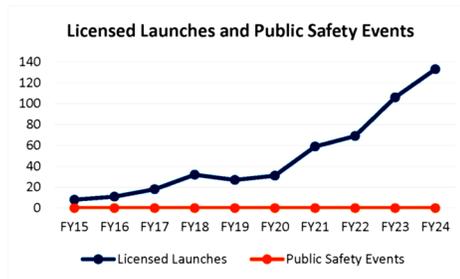
Chairman Babin, Ranking Member Sorensen, and distinguished members of the Subcommittee, thank you for the opportunity to provide testimony today on the importance of encouraging commercial space innovation while maintaining public safety.

Growth and Safety

The U.S. launch sector has seen tremendous growth over the last decade. We have seen FAA-licensed launches increase from eight in FY 2015 to 133 in FY2024. We have seen over \$28 billion invested in the U.S. launch industry over the last decade,[#] the establishment of several new U.S. launch companies, the development of multiple new U.S.

launch vehicles, and the emergence of global, U.S.-based space tourism businesses.

Throughout this growth period, the U.S. has maintained a 100% public safety record.



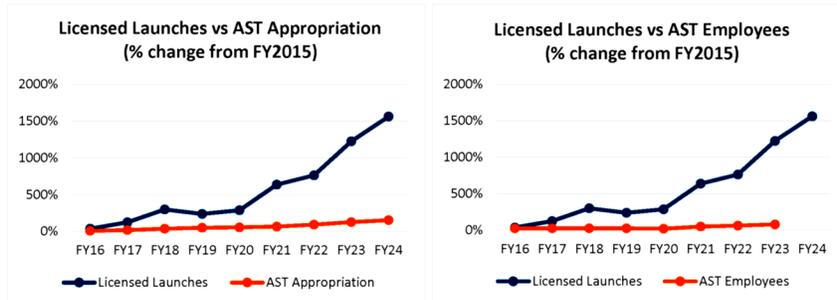
This growth, however, has stressed the licensing framework and provides Congress with two

opportunities to encourage commercial space innovation while maintaining public safety: (1) addressing resource constraints within FAA’s Office of Commercial Space Transportation (AST), the office responsible for licensing U.S. commercial launches, and (2) alleviating challenges with the implementation of a new set of licensing regulations, known as Part 450.

Resource and Workforce Constraints

The growth in licensing activity has far outpaced the growth in AST resources. From FY2015 to FY2024, licensed launch activity grew 1,563% compared to AST appropriations growth of 153% and AST employee growth of 77% (employee data only available to FY2023). This resource

constraint results in a workforce shortfall at AST, while also slowing process improvements, such as development of a tool to provide more transparent application tracking.



Source: Space Policy Group analysis from FAA and GAO data. FY24 employee data not available.

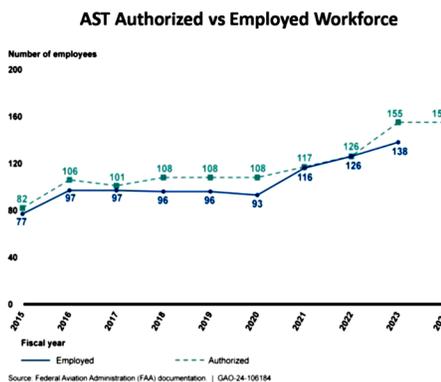
The Government Accountability Office (GAO) recently examined AST’s workforce and found workforce challenges are directly impacting licensing activity. The GAO found,

“... these ongoing staffing challenges have affected how AST carries out some of its licensing and post-licensing oversight responsibilities, including for operations with humans onboard. For example, as a result of limited staff, AST officials told us that the office has decreased the amount of assistance provided to operator consultations prior to license evaluation. AST officials also told us that the office prioritizes the highest risk operations for in-person inspections and conducts other inspections remotely or through reviewing post-activity reports from operators.”

The GAO further identified AST challenges in employing personnel up to its authorized hiring levels (see chart below).ⁱⁱⁱ GAO noted competition with private industry and training as two barriers to AST meeting its authorized staffing needs. AST faces competition with private industry both to hire new staff and to retain experienced staff. Moreover, new staff require on-the-job training from current experienced staff, aggravating near term staffing constraints. Continuing resolutions also impact the hiring process, as funding uncertainty and lack of availability of new funds prevent AST from starting the hiring process.

Related COMSTAC Activity

The FAA maintains an external advisory body known as the Commercial Space Transportation Advisory Committee (COMSTAC) to provide information, advice, and recommendations on issues concerning the U.S. commercial space transportation industry.^{iv} Members of the COMSTAC and space trade associations represented by members of the COMSTAC have consistently pressed for additional resources to support licensing activity at AST. This includes letters to Congress in support of AST's budget request for additional licensing staff.^v



On the workforce front, COMSTAC is currently tasked with providing recommendations on strengthening AST's hiring practices and maintaining current employees' technical knowledge. The COMSTAC is considering:

- Programs and opportunities to facilitate greater FAA employee and industry interactions and knowledge sharing;
- Training and development activities for FAA employees; and
- Methods to increase the workforce pipeline through academic partnerships.

The COMSTAC is currently gathering inputs on these topics to develop recommendations for AST at its upcoming September public meeting.

Part 450 Implementation Challenges

The Part 450 rules were intended to streamline the licensing process by allowing launch operators to provide their own means of compliance for certain requirements ("performance-based rules") and by allowing multiple launches and reentries to occur under a single license. Challenges have emerged in the implementation of the Part 450 rules, exacerbated by the resource challenges discussed above. A requirement that launch vehicles operating under the legacy regulatory structure must transition to Part 450 by 2026 is creating additional strain on the system. These strains have visibly manifested across several aspects of the licensing process.

Pre-application Process

The Part 450 regulatory process includes a period of “pre-application,” where AST determines whether the application is providing adequate means of compliance to move forward into a 180-day time-limited evaluation process. Operators have expressed concern about the lack of a set timeline for the preapplication process and transparency into the status of an application during this period. Moreover, operators note a lack of clarity on what exactly is required to be deemed “complete enough” to proceed into the application process. Operators have also noted circumstances where a change in the AST employee during the pre-application process can lead to a conflicting set of comments from examiners on the same matter, further extending the process.

Advisory Circulars and Performance-Based Determinations

Part 450 is intended to create a performance-based framework in which an operator can meet requirements using its own means of compliance. This framework is buttressed by “Advisory Circulars” (“ACs”), FAA-produced documents that provide *one* means of compliance for a particular regulatory requirement. Operators have expressed concern that ACs have become *the* means of compliance, leading operators to work toward the AC and away from performance-based determinations. This dynamic has increased the importance of having ACs that address all key areas of the new regulations. From some operators’ perspectives, having a way to meet the regulations via an AC is preferable to a “trial and error” approach, even if that is counter to the intent of Part 450 and may be a suboptimal approach overall.

Limited Approvers

Some aspects of the Part 450 regulations require operators to provide additional or different analyses than were regularly accepted under the legacy regulations. From some operators’ perspectives, approval of these additional or different analyses requires determinations from a small set of senior AST experts, creating a natural bottleneck. Moreover, these same experts are often required to make important determinations on the substance of key ACs, further stretching their availability.

Interagency Decision-making

In certain steps of the licensing process, AST and the launch range entity, for example the Space Force or NASA at certain federal ranges, will have a role in conducting their own safety analyses. The Part 450 regulations set up a framework for the use and approval of these other agencies’ assessments to meet regulatory requirements. Despite this framework, operators have raised concerns about multiple or duplicative safety analyses being required across these agencies. Concerns have also been raised about AST requiring extended timelines for the acceptance of another agencies’ findings.

Environmental Requirements

FAA launch licensing is considered a federal action under the National Environmental Policy Act (“NEPA”) requiring environmental impacts of launch and reentry activities to be considered before a license can be issued. AST has historically used existing NEPA findings to support launch and reentry licenses. According to a recent GAO analysis, 19 of the 22 NEPA reviews FAA prepared in support of launch and reentry were based on previous environmental assessments or environmental impact statements.^{vi} The increased growth of spaceflight in number of launches, location of launches, and variety of launch vehicles raises the potential for additional stakeholder concerns in NEPA determinations, which could add significant time and resource constraints to the licensing process if space activities were to receive NEPA challenges typical in other sectors.

Related COMSTAC Activity

COMSTAC has engaged in substantive efforts over the last two years to provide feedback to AST on the implementation of Part 450. In July 2023, COMSTAC provided a comprehensive document on “Part 450 – Challenges and Recommendations.”^{vii} The COMSTAC provided feedback on specific Part 450 regulations covering: (1) the importance of Advisory Circulars (ACs); (2) the timeframes for reviewing application materials and providing timely feedback; (3) the use of pre-defined versus performance-based means of compliance; (4) the need for clarity on reentry requirements versus launch requirements; (5) transparency into the software and analysis tools that are acceptable for use; and (6) the need to account for changing technical standards during an ongoing licensing effort.

In April 2024, the COMSTAC provided a series of additional recommendations related to Part 450.^{viii} These additional recommendations included: (1) the FAA should engage meaningfully and consistently with FAA applicants and interested parties to define clear goals for regulatory reform; (2) the FAA should reinvigorate its efforts to publish Advisory Circulars (ACs) that address aspects of the Part 450 regulations; (3) the FAA should evaluate a change to its policy and regulations to address the significant challenges with its Means of Compliance review and methodologies for Flight Safety Analyses; and (4) the FAA should expeditiously move forward with the Part 450 Space Advisory Rulemaking Committee (SpARC).

Congressional Action

Congress can address the resource constraints outlined above and has avenues to alleviate the challenges of Part 450 implementation.

- *Resources* – Congress has already taken commendable action in the House and Senate Appropriations Committees with marks supporting AST’s request for a 36% budget increase to \$57 million. This request includes \$7.9 million to hire additional licensing staff.
- *Workforce* – In addition to supporting AST’s requested funding, Congress could examine additional hiring flexibilities and pay and retention bonus authorities to attract and retain key licensing staff. To increase AST employees’ knowledge of industry practices, Congress could also consider the development of an AST / industry workforce sharing program akin to the Department of Defense’s Public-Private Talent Exchange program.
- *Application Timelines* – The Part 450 preapplication process has minimized the purpose of the 180-day review timeline, and Congress should consider alternative means of maintaining a time-limited and transparent licensing process. Congress should consider whether to track metrics at the beginning of the pre-application process and track time based on whether the application is in AST or the applicant’s possession. This “chess clock” versus “shot clock” approach, coupled with tools such as AST’s planned License Electronic Application Portal (LEAP) tool, should provide better transparency to applicants, AST, and Congress.
- *Legacy Means of Compliance* – Congress should consider whether operators should be allowed to meet the legacy regulatory requirements instead of Part 450 requirements while key advisory circulars are still being developed. This change could be particularly impactful before AST resources are further constrained as legacy licensees transition to Part 450.
- *Interagency Decision-making* – Congress should consider additional direction and requirements to minimize duplication of safety analyses across AST and federal range agencies and allow operators to use available range analyses that meet requirements.
- *Environmental Requirements* – Congress is actively reviewing the overall federal environmental regulatory framework as it applies to renewable energy development. Congress can consider whether some of these efforts are applicable to the launch licensing framework.

Thank you for the opportunity to present this testimony and for the Subcommittee’s enduring commitment to the growth and safety of the U.S. space industry.

¹ This testimony is provided in my personal capacity and does not represent any company or clients’ views.
ⁱⁱ Space Capital dashboard available at spacecapital.com.

ⁱⁱⁱ *Commercial Space Transportation, FAA's Oversight of Human Spaceflight*, Government Accountability Office, February 2024, available at <https://www.gao.gov/assets/gao-24-106184.pdf>.

^{iv} COMSTAC members and information on COMSTAC meetings available at https://www.faa.gov/space/additional_information/comstac.

^v See, e.g., AIA/CSF letter available at <https://www.aia-aerospace.org/publications/aia-csf-fy23-thud-letter/>.

^{vi} *Commercial Space Transportation, How FAA Considers Environmental and Airspace Effects*, Government Accountability Office, April 2024, available at <https://www.gao.gov/assets/gao-24-106193.pdf>.

^{vii} COMSTAC *Part 450 – Challenges and Recommendations* document available at <https://www.faa.gov/media/68016>.

^{viii} COMSTAC document available at <https://www.faa.gov/media/78751>.

Mike French

Mike has shaped space policy through a unique mix of NASA, White House, and private sector experience. He has advised senior government leaders on space policy, developed market forecasts and growth strategies for industry executives, and analyzed major space investments for companies and funds. He is a recognized expert on space policy and space market developments, serving as a regular media contributor, Congressional witness, and frequent public speaker on space topics. In addition to leading the Space Policy Group, Mike also serves as a senior advisor on space issues to global consulting firm [BCG](#).

Mike has held leadership roles across the federal government, including as NASA's Chief of Staff. As Chief of Staff, he helped execute NASA's priorities across the agency's commercial space, exploration, science, and aeronautics programs. Mike's private sector experience includes leading a diverse coalition of over 70 space companies to advocate for policies, regulations, and investments across the civil, commercial, and national security sectors. He also led the commercial space practice of a market analysis and management consulting firm, advising private sector clients on growth, policy, and investment decisions.

Mike began his career as an attorney in the aerospace and regulated industries practice of an international law firm. He holds a B.S. from U.C. Berkeley and a J.D. from Harvard Law School.

Chairman BABIN. Thank you.
I now recognize Ms. Meredith for 5 minutes to present her testimony.

**TESTIMONY OF MS. PAMELA L. MEREDITH, CHAIR,
SPACE LAW PRACTICE GROUP, KMA ZUCKERT LLC**

Ms. MEREDITH. Thank you, Mr. Chairman and Chairman Lucas and Members of the Subcommittee. Today's hearing ties directly into the FAA's licensing mandate, which is to promote the commercial space transportation industry while keeping the public safe. Lo and behold, the FAA has succeeded in this. We have a thriving launch industry, and we have had no major safety events affecting the public.

Now, that said, there are challenges in the licensing regime, and these relate specifically to part 450 of the FAA regulations, which has been mentioned here earlier. Part 450, of course, was intended to streamline and simplify. In practice, it has not done that. It is a maze—complex to navigate, complex to understand, and hard to comply with. It hampers an industry that is ready to move faster.

Now, let me give some examples. Some have been provided already today. We've talked about performance-based requirements, and there are also flexibility options, such as showing equivalent level of safety for applicants that can't comply with the FAA requirements. Now, that sounds helpful and simple, but in practice, this is a two-edged sword. It's flexible because it gives the applicant an opportunity to pick a mode of operation or a method of compliance; yet it takes time for the FAA to evaluate, and it often requires a one-off evaluation, which consumes resources.

Now, there are mitigating measures for this, additional guidance to industry in the form of advisory circulars, which has been mentioned here earlier, creating a data base of safety evaluations of interest across the board, and potentially putting time limits on the FAA's evaluations of various modes of compliance or equivalent level of safety evaluations. These are things to consider.

The 180-day statutory review period is also a concern, not in and of itself, but the problem, as Mr. French mentioned, is that it doesn't begin to run before the applicant is through a complex and lengthy preapplication consultation. Add to that the practice of tolling, whereby the FAA can stop the clock in the middle of the review process to ask for additional information, documentation, and analysis. That is also a concern. So, as you can see, we have a licensing regime with lack of certainty, lack of transparency, and significant delay.

Now, granted, it isn't easy to regulate this industry. It is an awesome responsibility, and the industry is growing fast and is diverse, and perhaps it's too much to ask the FAA to do better, but I think there are things that can be done even in a constrained resource environment.

For example, should resources within the FAA be allocated and prioritized for certain types of applications, I ask the question, for example, should launches with a mission that serves a compelling national interest or a national security interest take priority in the licensing process? Should pending applications take priority over new pre-application consultations? Should payload reviews for ex-

isting license application take priority over new payload reviews? And here is one thing the FAA definitely, or the AST specifically, definitely should do, and that is to focus its resources on matters strictly within its jurisdiction.

Now, all of this is all the more pressing with the looming deadline for the transition to part 450 for all licenses and new license applications, which must happen before March 10, 2026, and that must happen without disruption or interruption to current launch operations to keep the industry thriving and robust as it is.

Thank you, and I'm happy to answer questions. I have written testimony, of course, that has details for all of this.

[The prepared statement of Ms. Meredith follows:]

60

Statement of Pamela L. Meredith
Chair, Space Law Practice Group
KMA Zuckert LLC

Before the
U.S. House of Representatives
Committee on Science, Space, and Technology
Subcommittee on Space and Aeronautics

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

Tuesday, September 10, 2024
2318 Rayburn House Office Building
Washington, D.C.

The title of the Hearing – “Encouraging Commercial Space Innovation While Maintaining Public Safety” – taps directly into the FAA’s mandate under the Commercial Space Launch Act (“CSLA”): To promote the commercial space transportation industry while maintaining public safety. Lo and behold, the FAA has succeeded: We have a thriving space transportation industry and, touch wood, have not had a major public safety event.

Yet, regulatory challenges remain that complicate and delay the licensing process and hamper industry progress. I discuss these challenges at pages 4-7 below and provide ideas for how they could be mitigated by prioritization of tasks and targeted allocation of resources and by reducing uncertainty and the timeline for licensing at pages 7-9. I briefly touch on the issue of expanded jurisdiction for AST at pages 9-10.

My experience with launch licensing goes back to the early-1990s (when the Office of Commercial Space Transportation was a small office within the DOT, before the delegation of responsibility for commercial launch licensing to the FAA in 1995). Both the licensing rules and the space office, now known as “AST” for the Associate Administrator for Commercial Space Transportation, have evolved substantially since then – in step with developments in the commercial space industry and legislation expanding the FAA’s jurisdiction.

Background

The last major overhaul of launch licensing rules happened 18 years ago.¹ The rules adopted then were modeled in large part on the safety standards and requirements at Federal ranges.² These rules were well suited for traditional expendable launch vehicles (ELV) launching from Federal launch sites under an FAA license. But they were ill-suited for new launch vehicle concepts – such as vehicles incorporating foreign rocket stages, reusable launch vehicles, vehicles incorporating elements of reusability, air-launched launch vehicles, suborbital rockets, and human spaceflight. The result was a patchwork of different regulatory regimes.³

¹ Licensing and Safety Requirements for Launch, FAA, 71 Fed. Reg. 50507 (Aug. 25, 2006) (adding Part 417).

² See 71 Fed. Reg. at 50509 (“codif[ying] the successful safety measures that the Department of Defense and NASA have implemented at Federal launch ranges”).

³ See Commercial Space Transportation Reusable Launch Vehicle and Reentry Licensing Regulations, FAA, 65 Fed. Reg. 56618 (Sept. 19, 2000) (adding Part 431, Launch and Reentry of a Reusable Launch Vehicle (RLV); Part 433, License to Operate a Reentry Site; Part 435, Reentry of a Reentry Vehicle Other Than a Reusable

The FAA adopted Part 450 in 2020⁴ to consolidate the different regulatory regimes into one set of rules, a single licensing regime. This was intended to streamline and facilitate licensing. The results are mixed. Part 450 is voluminous and complex, a bit of a maze. It is hard to navigate and understand and often requires license applicants to seek outside legal counsel to figure out how to comply.

14 C.F.R. Part 450

As noted, the FAA, AST has a dual mandate: Ensure public safety and promote the commercial space transportation industry.⁵ Part 450 was adopted in response to a concern that the second aspect of the mandate did not get sufficient attention. Part 450 was prompted by Space Policy Directive-2, Streamlining Regulations on Commercial Use of Space (May 24, 2018), which required the Secretary of Transportation (and by delegation the FAA, AST) to minimize regulatory uncertainty and to promote economic growth.

Part 450 was well-intentioned in that it consolidated the separate licensing regimes for launches (by ELVs, reusable launch vehicles, and suborbital rockets) and reentries into one set of rules.⁶ The idea was to streamline and facilitate the licensing process, e.g., by giving applicants a single licensing regime with more flexibility in how they meet safety requirements and standards.⁷

Part 450 implements the FAA's mandate to license launches and reentries "consistent with public health and safety, safety of property, and the national security and foreign policy interests of the United States."⁸ Part 450 is primarily concerned with safety of launch, flight and reentry as part of AST's safety review, but it also includes rules for policy review (focusing on national security

Launch Vehicle (RLV); Licensing and Safety Requirements for Operation of a Launch Site, FAA, 65 Fed. Reg. 62812 (Oct. 19, 2000) (adding Part 420, License to Operate a Launch Site); Human Space Flight Requirements for Crew and Space Flight Participants, FAA, 71 Fed. Reg. 75616 (Dec. 13, 2006) (adding Part 460, Human Space Flight Requirements).

⁴ Streamlined Launch and Reentry License Requirements, FAA, Final Rule, 85 Fed. Reg. 79566 (Dec. 10, 2020) (effective March 10, 2021 and adding 14 C.F.R. Part 450) ("Part 450 Final Rule").

⁵ See 51 U.S.C. §§ 50901(b); 50903(b), (c); 50903(a).

⁶ *Part 450 Final Rule*, 85 Fed. Reg. at 79567 ("This rule amends 14 CFR parts 415, 417, 431, and 435 by consolidating, updating, and streamlining all launch and reentry regulations into a single part 450."). See 14 C.F.R. §§ 450.45(e)(5), 450.207 (for human spaceflight, an applicant must comply with Part 460).

⁷ *Part 450 Final Rule*, 85 Fed. Reg. at 79567.

⁸ 51 U.S.C. § 50905.

and foreign policy implications) (§ 450.41), payload review (§ 450.43), and environmental review (§ 450.47).

Part 450 requires two major sets of analyses: Flight Safety Analysis and Functional Hazard Analysis:

- A Flight Safety Analysis must identify risks associated with launch/reentry⁹ to demonstrate compliance with safety criteria and casualty thresholds. This includes analyses of, e.g., trajectories for normal flight and malfunction, hazardous debris characterization, population exposure, probability of failure, flight hazard areas, debris risks, and far-field overpressure blast effects.¹⁰
- A Functional Hazard Analysis is used to determine the hazard control strategy best suited for the type of vehicle. Flight abort (controlled ending of flight) is the traditional approach for ELVs. Reusable launch vehicles typically require the applicant to perform an involved flight hazard analysis¹¹ if “public safety hazards cannot be mitigated adequately” using the hazard control strategies of physical containment, wind weighting, or flight abort.¹²

Part 450 promised a more flexible licensing regime: Rules would to a great extent be performance-based rather than prescriptive, meaning they would give increased flexibility to applicants in how they could meet a particular requirement or standard. In addition, Part 450 offers alternative ways to meet or avoid regulatory requirements (flexibility options):

- Demonstrate Equivalent Level of Safety (ELOS) in lieu of compliance with a requirement (§ 450.37).¹³

⁹ 14 C.F.R. § 450.113. Certain exceptions apply (*e.g.*, § 450.113(b)).

¹⁰ See *Part 450 Final Rule*, 85 Fed. Reg. at 79571.

¹¹ A flight hazard analysis must “[i]dentify all reasonably foreseeable hazards, and the corresponding failure mode for each hazard, . . . [a]ssess each hazard’s likelihood and severity, [e]nsure that the likelihood of any hazardous condition that may cause death or serious injury to the public is extremely remote, [i]dentify and describe the risk elimination and mitigation measures required to [ensure the risk to the public is extremely remote],” and “[d]ocument that the risk elimination and mitigation measures achieve the [extremely remote] risk level . . . through validation and verification.” See 14 C.F.R. § 450.109(b).

¹² 14 C.F.R. § 450.107(c).

¹³ This option is broadly available. See *Part 450 Final Rule*, 85 Fed. Reg. at 79575 (“In the NPRM, the FAA proposed in § 450.37 (Equivalent Level of Safety) that for all requirements in part 450, except § 450.101, an

- Demonstrate reliability through operational and flight history as an alternative to a flight safety analysis (§ 450.113(b)).
- Propose a special means of compliance (MOC) with a regulatory requirement (as agreed beforehand by AST) (§ 450.35(b)).
- Apply for a waiver of the regulatory requirement (§ 450.37).

Issues with Part 450

This set-up sounds simple, but in practice it is not. Performance-based standards while helpful are a two-edged sword – it takes a longer time to evaluate whether the regulatory goal is met for a performance-based standard than to check off the box that a prescribed method has been followed. Advisory Circulars (“AC”) are in some cases available to guide applicants to acceptable means of compliance with performance-based standards.¹⁴ The AST has adopted 21 ACs in all since 2020,¹⁵ but many important safety requirements in Part 450 remain without guidance¹⁶ and applicants are left having to propose a means of demonstrating compliance with the standard which may or may not be acceptable to AST.

Likewise, the alternative ways of meeting regulatory requirements (flexibility options) are not always available and the criteria for using them can be difficult to meet. Also, the regulator’s evaluation of whether the criteria are satisfied can be time consuming and require the applicant to produce additional analysis and documentation.

applicant may clearly and convincingly demonstrate that an alternative approach provides an equivalent level of safety (ELOS) to the requirement. In the final rule, the FAA revises § 450.37 so that only some portions of § 450.101—specifically § 450.101(a), (b), (c)(1), (c)(3), (d), (e)(1), and (g)—are excluded from eligibility for an ELOS approach.”)

¹⁴ *Part 450 Final Rule*, 85 Fed. Reg. at 79567 (“Where possible, the FAA has adopted performance standards, and considered the prescriptive requirements for placement in advisory circulars (AC) that will identify possible means of compliance, but not the only means of compliance, with this rule.”).

¹⁵ Federal Aviation Administration, Commercial Space Advisory Circulars (ACs), <https://www.faa.gov/space/legislationregulationguidance/commercial-space-advisory-circulars-acs/commercial-space> (last visited Sept. 4, 2024).

¹⁶ For example, AC 450.115-1B (issued Aug. 2, 2024) refers to important ACs that have not yet been published: AC 450-113-1, Level of Fidelity; AC 450.119-1, High-Fidelity Malfunction Trajectory Analysis; and AC 450.137-1, Distant Focusing Overpressure (DFO) Risk Analysis. Likewise, AC 450.117-1 (issued Aug. 19, 2021) refers to ACs that also have not yet been published: AC 413.5-1, Pre-Application Consultation; AC 450.115-2, Medium-Fidelity Flight Safety Analysis; AC 450.119-1, High-Fidelity Malfunction Trajectory Analysis.

- Take for example, ELOS – here, an applicant must to show that, even though it is doing things differently than what the rule calls for, the method it is using is equally safe. The standard is high: The applicant must “clearly and convincingly” demonstrate ELOS (§ 450.37). ELOS is also not available for certain critical safety requirements,¹⁷ e.g., the thresholds for injury and damage to the public at large, individuals and aircraft in flight and critical safety areas.
- Likewise, waivers of regulatory requirements are not always easy to obtain and may not be possible to obtain. An applicant needs to show that not complying with a regulatory requirement 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 U.S.¹⁸

In addition, the timelines for the licensing process are not always clearly defined. Take, for example, the standard an applicant must meet in order to transition from “pre-application consultation” to the AST’s acceptance of a license application for initial review: For this to happen, the application must be “complete enough.”¹⁹ The standard is vague.²⁰ An applicant must sort through a 69 page Advisory Circular²¹ to determine what information must be submitted in order for the application to be “complete enough” to submit for initial review.

The “complete enough” standard is important because it is then that the 180 day statutory review period for AST to make a licensing decision begins to run.²²

An applicant may request that AST undertake an “incremental” safety review,²³ but in that case, the 180 day statutory review period does not apply; instead, “an agreed upon review period will begin once the FAA has a complete enough application in its entirety.”²⁴ In practice, this

¹⁷ *Part 450 Final Rule*, 85 Fed. Reg. at 79575 (“[§§] 450.101(a), (b), (c)(1), (c)(3), (d), (e)(1), and (g)—are excluded from eligibility for an ELOS approach.”).

¹⁸ 51 U.S.C. § 50905(b)(3); 14 C.F.R. § 450.37.

¹⁹ 14 C.F.R. § 414.19; *Part 450 Final Rule*, 85 Fed. Reg. at 79578.

²⁰ 14 C.F.R. § 414.19; *Part 450 Final Rule*, 85 Fed. Reg. at 79578 (“must include enough information for the FAA to start its review [of the application]”).

²¹ Guidance on Submitting a Complete Enough and Complete Application for a Vehicle Operator License, AC 413.13-1 (Dec. 18, 2023).

²² *Part 450 Final Rule*, 85 Fed. Reg. at 79579 (“The FAA begins the calculation of the 180-day statutory review period on the date that it receives the information needed to make the application complete enough, regardless of how long it takes to make that determination.”).

²³ 14 C.F.R. § 450.33 (Incremental Review and Determinations); *Part 450 Final Rule*, 85 Fed. Reg. at 79578.

²⁴ *Part 450 Final Rule*, 85 Fed. Reg. at 79586.

approach entails considerable uncertainty, which can complicate the applicant's business planning.

The pre-application process also requires applicants to identify the means of complying with certain key safety requirements in Part 450, which must be accepted by AST before the application can be submitted.²⁵ In addition, for vehicles that pose unique safety hazards not addressed in Part 450²⁶ applicants are advised to seek acceptance of their proposed means of compliance prior to submitting their application.²⁷ Preparing all this and getting the AST's signoff before submitting the license application can be unduly burdensome.

The sheer volume and complexity of Part 450 (and accompanying ACs) also means that processing the application once submitted is time-consuming. This is further exacerbated by the practice of tolling the 180 day statutory review period. Part 450 permits tolling where the accepted license application does "not provide sufficient information to continue or complete the reviews or evaluations required"²⁸ The AST may stop the clock on the review period until it gets the information it requires.²⁹ This is especially concerning for new launch vehicle concepts or technologies where the need for information, reviews and analysis is typically greater.

Delay in processing of license applications may also result from a constrained resource environment. Where that is so, a judicious allocation of resources and prioritization of focus by AST become all the more important.

²⁵ See 14 C.F.R. § 450.35(a) ("Prior to application acceptance, a means of compliance must be accepted by the Administrator for the following: (1) Section 450.115(b)(1) regarding flight safety analyses; (2) Section 450.139(e)(1) regarding toxic hazards for flight; (3) Section 450.145(b) regarding highly-reliable flight safety system; (4) Section 450.163(a)(1) regarding lightning hazard mitigation; and (5) Section 450.187(e)(1) regarding toxic hazards mitigation for ground operations."); AC 413.13-1, s. 6.1.1. (noting that an "applicant must submit the MOC [means of compliance] for these five topics for FAA acceptance prior to the license application review period"). AC 413.13-1, s. 6.1.3 (listing the six types of acceptable means of compliance that the FAA has identified).

²⁶ See 14 C.F.R. § 450.177.

²⁷ See AC 413.13-1, s. 6.1.2.

²⁸ 14 C.F.R. § 413.15(b).

²⁹ Streamlined Launch and Reentry Licensing Requirements, FAA, NPRM, 84 Fed. Reg. 15296, 15302 (Apr. 15, 2019) (discussing tolling under the legacy rules: three out of 10 licensing determinations (the last ten new license determinations through calendar year 2018) were tolled for 73, 77, and 171 days).

Directions to Consider

Granted, the FAA has an awesome responsibility in keeping the general public safe given a diverse and growing launch industry and asking for more may seem unreasonable. Nonetheless, below are some ideas for the Subcommittee to consider as possible direction to AST in a constrained resource environment:

- Align licensing priorities with broader national interests by prioritizing the applications of entities that can demonstrate that the proposed launch will support missions with a clear and compelling national interest or national security interest. This is arguably in line with the AST’s licensing mandate to issue licenses consistent with the “national security and foreign policy interests of the United States.”³⁰
- Allocate personnel and resources strictly based on areas currently within AST’s jurisdiction, *i.e.*, licensing of launches, reentries, and operation of launch sites. This would exclude safety considerations relating to matters such as mission success and in-space payload operations and orbital debris. The AST’s mandate concerns public safety of launch and reentry.³¹
- Limit payload reviews to those required for pending FAA launch license applications. Payload reviews for payloads intended for launch on foreign launch vehicles as a means of obtaining the U.S. Government blessing for the mission seem outside the purview of the FAA’s present statutory authority.³²
- Prioritize pending license applications over new pre-application consultations. This would ensure launch availability for payloads waiting to be launched and promote growth of the space industry. Launch providers that have achieved a certain launch cadence, in line with the aspirations of the CSLA, deserve to be treated favorably. On the other hand,

³⁰ See, e.g., 51 U.S.C. §§ 50901(b)(3); 50905(a)(1).

³¹ 51 U.S.C. § 50905(a).

³² See 14 C.F.R. § 450.43(d) (“a payload owner or payload operator may request a payload review and determination.”); 51 U.S.C. § 50904(c) (“[i]f no license, authorization, or permit is required [for a payload to be launched], the Secretary may prevent the launch or reentry if the Secretary decides the launch or reentry would jeopardize the public health and safety, safety of property, or national security or foreign policy interest of the United States.”).

such treatment favors existing players and risks stifling innovation. The pros and cons would need to be weighed.

- Direct AST to limit requests for information to what is strictly necessary to satisfy AST’s public safety, national security and foreign policy mandate and avoid requests for information of general or scientific interest; avoid duplication of safety information, reviews and analysis;³³ set timelines for ELOS and MOC evaluations to the extent possible; and define terms such as “continuing accuracy.”³⁴ These measures align with the direction to the FAA to simplify and expedite the licensing process.³⁵

The Committee may also wish to ensure that AST is prepared for the transition to Part 450 of launch licensees currently operating under the legacy rules. To ensure that the transition can be accomplished without interruption of commercial launch operations, including AST-licensed launches of U.S. government payloads. (Some launch companies that had licenses at the effective date of Part 450 opted to continue operating under the old regulations.) The deadline for the transition is March 10, 2026.³⁶

Finally, the Committee may wish to consider legislation giving the FAA the authority to issue experimental permits also for *orbital* launch and reentry. At present, this authority is limited to suborbital flights.³⁷ Such permits are available for testing, showing compliance with regulatory requirements, and crew training.³⁸ Permits offer added flexibility in that the permittee may conduct an unlimited number of launches or reentries for a particular rocket design.³⁹ The

³³ For example, if applicant meets a specific Federal range requirement, that should be sufficient. Likewise, if an aircraft used for as a carrier vehicle for an air-launched launch vehicle has obtained an experimental aircraft certificate from the FAA, it should not be necessary to duplicate a safety analysis completed for that purpose.

³⁴ 14 C.F.R. §§ 417.11 (legacy rules), 450.211.

³⁵ See 51 U.S.C. § 50101 (“(1) to promote economic growth and entrepreneurial activity . . . ; [and] (2) to encourage the United States private sector to provide launch vehicles, reentry vehicles, and associated services by— (A) simplifying and expediting the issuance and transfer of commercial licenses”); Space Policy Directive-2, Streamlining Regulations on Commercial Use of Space (May 24, 2018).

³⁶ *Part 450 Final Rule*, 85 Fed. Reg. at 79567 (“After March 10, 2026, parts 415, 417, 431, and 435 will be removed.”).

³⁷ See 51 U.S.C. § 50906(d) (“The Secretary may issue a permit only for reusable suborbital rockets or reusable launch vehicles that will be launched into a suborbital trajectory or reentered under that permit”); 14 C.F.R. Part 437.

³⁸ 51 U.S.C. § 50906(d).

³⁹ 51 U.S.C. § 50906(e)(1).

statutory review period for a permit is shorter (120 days).⁴⁰ Experimental permits for orbital launches and reentries would be similar to the Federal Communications Commission’s (“FCC”) practice of issuing experimental permits for satellites under 47 C.F.R. Part 5 for similar purposes.

Additional Jurisdiction for AST

There has been debate for at least two decades about the need to authorize space objects or vehicles operated by U.S. private entities that do not fit within the three established licensing regimes for satellite communications,⁴¹ space transportation⁴² and satellite remote sensing.⁴³ The need for such legislation is anchored in Article 6 of the Outer Space Treaty, which requires the “authorization and continuing supervision” of non-governmental entities by a State party to the treaty.⁴⁴ Another rationale for such regulations is to provide certainty to prospective investors in new space ventures that a path to Government authorization exists for the mission.

The discussion has centered primarily on these topics: (1) which government agency should be designated as the focal point for authorizations – the Department of Commerce and the FAA, AST being the two agencies in play, (2) what form should the authorization take, (3) what scope of activities should be included, (4) what the criteria for authorization should be, (5) what the relationship to other authorizing agencies regulating space operations should be, and (6) whether the operator should be responsible or liable for damage it causes if the U.S. Government incurs treaty liability as a result.⁴⁵

Many bills have been introduced over the years. 2023 saw this Subcommittee put forth the Commercial Space Act of 2023,⁴⁶ which set up a certification process with minimal criteria. Responsibility of certification would rest with the Secretary of Commerce, with delegation to the

⁴⁰ 51 U.S.C. § 50906(a) (“the Secretary, not later than 120 days after receiving an application pursuant to this section, shall issue a permit if the Secretary decides in writing that the applicant complies . . .”).

⁴¹ 47 U.S.C. § 301 et seq.; 47 C.F.R. Part 25.

⁴² 51 U.S.C. §§ 50901-50923; 14 C.F.R. Parts 400-460.

⁴³ 51 U.S.C. §§ 60101-60162; 15 C.F.R. Part 960.

⁴⁴ Treaty Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 18 U.S.T. 2410, 610 U.N.T.S. 205 (done Jan. 27, 1967) (“Outer Space Treaty”), art. VI (“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.”).

⁴⁵ See *Outer Space Treaty*, arts. VI, VII; Convention on International Liability for Damage Caused by Space Objects, 24 U.S.T. 2389, 961 U.N.T.S. 187 (done Mar. 29, 1972).

⁴⁶ H.R. 6131 (118th Cong.).

Office of Space Commerce. The White House proposed legislation shortly after the Subcommittee introduced its bill,⁴⁷ expanding the jurisdiction for AST over human spaceflight to also include on orbit activities, which are currently outside AST's purview. Neither bill resulted in legislation.

The White House proposal would amend the CSLA to define a "human space flight vehicle" to include a launch or reentry vehicle, habitat, or other object, built to operate in suborbital trajectory or outer space, including on a celestial body, with a human on board, and a license would be required to operate such a vehicle. The suitability of such legislation must be carefully considered in terms of, e.g.: (1) the AST's current work load, (2) AST's present experience with and state of regulatory preparedness for human spaceflight, (3) AST's lack of experience with regulating orbital flight, and (4) whether any other agency is better suited. Any additional responsibility for AST would obviously require additional resources.

Respectfully Submitted,



Pamela L. Meredith

Chair, Space Law Practice Group
KMA Zuckert LLC
888 Seventeenth St. NW
Washington, D.C. 20006

September 6, 2024

⁴⁷ Novel Space Activities Draft Legislative Text, available at <https://www.whitehouse.gov/spacecouncil/>.

Pamela L. Meredith



[Chair, Space Law Practice Group](#) (Of Counsel) (since 1998)

KMA Zuckert LLC
888 17th Street, NW
Washington, D.C. 20006

[Adjunct Professor](#), Satellite Communications and Space Law
American University, Washington College of Law (since 1989)

Ms. Meredith counsels satellite industry clients on business transactions, risk management and insurance, licensing and regulation, and dispute resolution and arbitration.

Practice Areas

Space-Related Transactions. Draft and negotiate satellite space hardware and service contracts, including satellite procurement contracts, launch service agreements, satellite service agreements, and satellite asset purchase agreements. Provide due diligence and input to space-related M&A transactions.

Space Project Risk Management and Insurance. Counsel clients on space project risk management and insurance options. Draft insurance policy language, render insurance coverage opinions, and provide insurance coverage defense.

Satellite Contract Dispute Resolution and Arbitration. Advise on dispute resolution and negotiate settlements. Serve as counsel or expert counsel in satellite-related arbitration (AAA, ICC, LCIA and *ad hoc*).

Space Regulatory. Advise on U.S. regulatory and licensing processes across the board, including FAA space office regulation and compliance with the Commercial Space Launch Act's liability and insurance regime; FCC licensing; and NOAA licensing of satellite remote sensing. Advise foreign space agencies and governments on space law development.

International Treaties. Advise on international space treaties, including the Outer Space Treaty, Liability Convention, and the ITU Radio Regulations. Advise and represent commercial interests in connection with international or bilateral treaty negotiation.

Memberships

Member, American Arbitration Association/ICDR's Panel on Aviation, Aerospace and National Security (2018-present); Member, Cosmos Club of Washington, D.C. (1994-present); Chair, American Institute of Aeronautics and Astronautics' (AIAA) Legal Aspects Committee (2005-2010); Member, Governing Committee of the ABA's Forum on Air & Space Law (2012-2014).

Education

- McGill University, Air & Space Law Institute (LL.M., 1983)
- University of Oslo School of Law (J.D. equivalent, 1981)

Bar Admissions

- District of Columbia; New York

Select Publications

Textbook: SPACE LAW, A CASE STUDY FOR THE PRACTITIONER: *Implementing a Satellite Business Project*, Kluwer Academic Publishers 1992 (with George Robinson).

Recent Articles:

The American Review of International Arbitration (Columbia University), 2013, "Commercial Satellite Contract Arbitration" (with Marshall Lammers).

The Air & Space Lawyer (American Bar Association), 2012, "Commercial Spaceflight: The 'Ticket to Ride,'" (with Marshall Lammers).

Air Transport, Air & Space Law and Regulation (Abu Dhabi, April 2009), "Commercial Space Transportation: Risk, Liability and Insurance."

The Air & Space Lawyer, 2008, "Space Insurance Law--With a Special Focus on Satellite Launch and In-Orbit Policies."

Chairman BABIN. Yes, ma'am. Thank you. Thank you for your testimony.

Before I begin my questions, I'd like to enter into a record—into the record a letter from SpaceX, so without objection, so ordered.

I want to thank the witnesses for your testimony, very valuable, and we really appreciate you folks coming this morning.

And the Chair recognizes himself for 5 minutes for questions.

Mr. Cavossa, China is racing to land humans on the Moon before us and is on track to do so by 2030. Can you speak to how red tape is impacting commercial space operators and, more broadly, progress towards American goals for space exploration?

Mr. CAVOSSA. Thank you, Mr. Chairman. Thank you for the question. There were a few things you said in your opening remarks that I wrote down that made a lot of sense to me. It was this concept of a red moon and red tape, and that's stuck in my head because that's something that we're concerned about. We're concerned that the licensing process right now, the implementation and management of the licensing process, is creating drag on the industry and its innovation. Anything that we need to put in space today, whether it's national security, a civil space mission, human space flight mission, remote sensing, all has to be launched on one of our member companies' rockets, and we're slowing that process down, whereas the Chinese are very much focused on enabling their industry to move as quickly as possible, without regard for safety.

We don't want to throw out public safety. We are very happy with the public safety record of this industry to date. We want to make sure that the implementation of 450 doesn't continue to slow this industry's innovation down. Thank you.

Chairman BABIN. Thank you.

Mr. Coleman, outside of FAA, other entities within the Federal Government have expertise in space operations, including NASA and Department of Defense (DOD). How is FAA leveraging existing practices of other agencies or operations which have already been reviewed and approved by another government agency so we can expedite application processing?

Mr. COLEMAN. Chair Babin, thank you for the question. We will certainly accept analyses and work that has been done by other Federal agencies if those analyses and that work meets our requirements. We allow launch service providers who are conducting launches from the Federal ranges to leverage the ranges' services to conduct those analyses. And so as long as those analyses meet our regulatory requirements, we will absolutely accept those analyses.

Now, there are some circumstances in which the Federal ranges are working in sort of different capacities with companies. For example, the Space Force 45 is working with SpaceX at Boca Chica in a different capacity than it does for launches that take place from the range itself. They're working in more of a contractor capacity with the Federal—with the launch service provider, and—which is a little bit different than the way they work when the launch is occurring from the Federal range itself.

Chairman BABIN. Thank you. And also, to follow up, you state in your testimony, Mr. Coleman, that over the last 11 years FAA has

issued 49 license determinations, averaging 151 days to issue a new license. Does that 151 days include time spent in the preapplication process before FAA accepts the application as complete enough? From the testimony I've heard, I'm—I think I know the answer, but please.

Mr. COLEMAN. Yes, the 150 days is the time that it takes from the clock starting to the determination being made. I will mention on the preapplication consultation, I think there's a little bit of a misconception about what preapplication consultation is and what constitutes preapplication consultation. In simple terms, it is a conversation between the regulator and the launch service provider where we exchange, from the launch service provider's standpoint, what the concept of operations is, what their operations are, when—where would they occur, et cetera. We share what the regulations require, what we're looking for, in terms of compliance, et cetera.

Once the applicant provides an application to us, we're no longer in preapplication consultation. We are in a period where we are now assessing whether that application is acceptable or not. Under part 450, applicants are required to provide means of compliance. This is work that they have to do to show us how they will comply.

Chairman BABIN. Well, if the average time for a new license—what is the average time for a new license if you account for this preapplication process?

Mr. COLEMAN. Well, I don't have that information and data—
Chairman BABIN. OK.

Mr. COLEMAN [continuing]. To account for preapplication—
Chairman BABIN. OK.

Mr. COLEMAN [continuing]. Consultation, but 151 days is the average time it takes us to conduct a determination for the license.

Chairman BABIN. But that does not include the preapplication process. OK.

Ms. Meredith, one more question here. This Committee passed the *Commercial Space Act* last November to ensure continued compliance with our international obligations in the least burdensome way possible. At the same time, the Administration proposed an approach that would grant several agencies broad and sweeping authority to not only maintain treaty compliance, but also to regulate anything “in the national interest,” quote, unquote, which they alone would determine. Can you comment on how the Administration's proposal would affect international competitiveness, as well as our Nation's ability to explore space.

Ms. MEREDITH. Yes, I hadn't specifically looked at the Administration's proposal for this, but I think a general complaint with all—with that sort of legislation is that—or proposed legislation is that it's overbroad and—

Chairman BABIN. OK.

Ms. MEREDITH [continuing]. Difficult to pass because it is overbroad. So I think that's one of the concerns with that legislation. Also bifurcating the licensing authority may not be the best approach. That was another thought I had about that legislation—

Chairman BABIN. OK.

Ms. MEREDITH [continuing]. Or proposed legislation. Yes.

Chairman BABIN. My time is expired, so I'm going to go to the Ranking Member, Mr. Sorensen.

Mr. SORENSEN. Thank you, Chairman.

And to you, Mr. Coleman, it's clear that you and the FAA are doing an outstanding job at ensuring public safety, so many thanks. It's also clear that transitioning to new part 450 regulations, while also responding to the increasing pace of launch activity, is an increasing challenge. With all of the potential steps and solutions being proposed in this hearing, do you believe that March 2026 is realistic or that we need to look at a later timeframe?

Mr. COLEMAN. Thank you for the question, Ranking Member Sorensen. I will say that March 2026, at the moment, looks very challenging. We have—as was mentioned, we have six licenses out of about 30 that have been transitioned to part 450. To get those additional licenses under part 450 in that timeframe will be very challenging, and we'll keep a close eye on how we are progressing toward that mark in 2026.

Mr. SORENSEN. Recognizing your office's growing workload, Congress has increased appropriations to help the FAA meet its demands for licensing services. A significant portion of the additional funding is for staff, especially as you compete with the private sector. Are we doing enough to make sure that you can meet those demands?

Mr. COLEMAN. Well, certainly, we appreciate what Congress has done to support our staff increases. We're now currently at 158 persons, which is the largest we've ever been. We've brought on about 35 new persons in the last year as a result of funding that we've received from Congress. But in the President's budget request for 2025 we are listening—looking for additional staffing that we will need to continue to keep pace with the demand for our products and services that we're seeing.

Mr. SORENSEN. And are we going to not only meet that demand here, but are we going to meet the demand when we are competing against China?

Mr. COLEMAN. Well, listen, we certainly understand and appreciate the importance of beating China to the Moon. We just had a conversation recently with NASA leadership where that was reemphasized, and our commitment certainly is to support this industry and our Nation in getting to the Moon before China. So we will do everything in our power to make sure that that happens.

Mr. SORENSEN. Mr. French, you noted that the advisory committee that you helped lead will be looking at workforce issues of FAA's Office of Commercial Space Transportation. When will that effort be completed, and do you anticipate additional authorities will be needed to support the staffing and workforce needs?

Mr. FRENCH. Thank you, Ranking Member Sorensen. We'll be talking about this actually next week at our public meeting, and then that'll likely sort of lead to some discussion with AST. We want to certainly get their feedback on how they think, you know, particular authorities could be useful to them. But I'll certainly put that together and provide it to the Committee, any takeaways from there.

Mr. SORENSEN. Thank you. I appreciate that.

And, Mr. Coleman, as a meteorologist myself, someone who believes that we should be good stewards of the environment that we have been given, environmental impacts have to be considered as we increase the launch frequency. As the cadence increases, what does the FAA need to do to help meet and assess environmental challenges?

Mr. COLEMAN. Well, you know, as you mentioned, environmental is very important. As we go through our campaigns to issue licenses, licensing being a major Federal action, we have to comply with *NEPA*. We—and in doing so, we looked at the potential impacts of these operations on the environment. We're looking at a couple of environmental reviews right now in Boca Chica and Florida. Due to increased operations in Boca Chica, we're looking at the impact on the environment due to those increased operations. We work very closely with our partners in Fish and Wildlife Service, the fisheries, and other agencies within the Department of Interior to make sure that we have the appropriate mitigations in place when necessary to address environmental needs associated with these licensing activities.

Mr. SORENSEN. Thank you, Mr. Coleman. And, Mr. French, in your opening statement, you talked about environmental challenges. How are we able to meet the need while continuing to progress forward in this sphere?

Mr. FRENCH. Yes, in my perspective, I'm—you know, I'm concerned this could be sort of a new emerging area in the licensing process. I think we're—a lot more attention is being paid to the space industry, and, as a result, I think a lot more attention be paid to the environmental aspects of the space industry.

You know, from a congressional perspective, Congress is doing quite a bit of thinking right now on the Federal permitting process as it relates to renewable energy. I think, sort of—I think it'd be appropriate to look at what's being considered in that area and see if some of those same changes would be appropriate from—for a space perspective.

Mr. SORENSEN. Thank you, Mr. French.

My time has expired. I yield back.

Chairman BABIN. Yes, sir. Thank you.

And now, I'd like to recognize gentlemen from Florida, Mr. Posey.

Mr. POSEY. Thank you very much, Chairman Babin.

Mr. Coleman, what is the budget amount for the application process, department or division or whatever you call it?

Mr. COLEMAN. In fiscal year—first of all, thank you for the question, Mr. Posey. The Fiscal Year 2024 budget for my office was \$42 million in operations funding.

Mr. POSEY. OK. How many employees do we have in that department?

Mr. COLEMAN. We currently have 158 staff members in our organization, with roughly 65 to 70 percent of those employees working licensing.

Mr. POSEY. OK. How many licenses do you have in process right now?

Mr. COLEMAN. I'll have to go back and take a look at the exact number, Mr. Posey, and get back to you on that, but I can tell you—

Mr. POSEY. Just swag it. I'm not going to hold you to it.

Mr. COLEMAN. Somewhere probably 30 to 40.

Mr. POSEY. OK. And the average time when the process starts, discounting any stoppage in the middle, is 151 days?

Mr. COLEMAN. Correct, on the average.

Mr. POSEY. Are you familiar with Starfighters?

Mr. COLEMAN. Yes, of course.

Mr. POSEY. Can you bring me up the date on the status of Starfighters?

Mr. COLEMAN. Well, I know that's very—that's a very important topic to you. That was something that the agencies looked at. I think there was legislation passed a couple years ago that would allow us to take a look at how we might be able to leverage that technology to support the commercial space industry, particularly in the area of commercial space—commercial human space flight. And there's probably some more details that I could probably collect for you. I'll have to get back to you on additional details.

Mr. POSEY. OK. Well, let me bring you up to date. Starfighters, they fly F-104 jets, retired pilots, thousands of hours aggregate in experience, safety record impeccable. They have flown—I know they did it before I came to Congress, so I assume for decades. They have been licensed or used by NASA to do parabolic missions. You know, it's so much easier to strap an experiment in the back seat of an F-104 and take it up and do your gravitational parabolic test. And so, inevitably, somebody's going to say, hey, would you take me for a ride? Well, they have to have a license to do that. They can probably get a license to do that easily in any other country in the entire world, but they went through the process and they applied for a license before I came to Congress 16 years ago, 16 years ago.

Now, you had licensed zero gravity to take dozens of people up in a big airplane and let them experience weightlessness. I've had a couple meetings with your agency and I can't for the life of me understand why in the world in over 16 years they can't get a license—now, I know you don't want hobbyists taking people up, you know, and you want to regulate it. And the excuse you're—I'm always given is, well, they're not an airliner that like goes back and forth from D.C. to Orlando 50 times a day. And they're not an inexperienced, totally novice like a launch—human launch license you issued over 16 years ago to a company who'd never even flown a cargo mission. You launched—gave them a license to launch human beings. They just want to—they're in the middle, and so you can't make a decision on that.

That's why I passed—specifically why we passed the legislation that you are aware of is so that you could license people to do that. And I just would like to know the reason why, beside arrogance, petulance, and defiance, it hasn't been done yet.

Mr. COLEMAN. Well, Mr. Posey, I certainly appreciate and understand your frustration. I really do. I will tell—you asked me about the number of applications that are currently on the slate for my organization. Starfighters currently is not one of them. Now, the legislation that was passed, best of my knowledge, was—we put those responsibilities for looking at Starfighters in another part of our agency under title 49. We're a title 51 organization.

So I will certainly take your concerns back to the agency. I will talk to my colleagues about that, and we will certainly circle back with you with a more detailed explanation to address your concerns.

Mr. POSEY. Yes, I know Starfighters have—they're working with George Neal, and they're happy with the licenses that they're getting. This is more a personal oversight perspective for me than it is Starfighters, and I really would appreciate if you would get back to me on that.

Thank you, Mr. Chairman. I see my time is about to expire.

Mr. COLEMAN. I will do so.

Mr. POSEY. I yield back.

Chairman BABIN. Thank you, Mr. Posey.

I'd now like to recognize the Ranking Member, Ms. Lofgren.

Ms. LOFGREN. Thank you. This has been a very interesting hearing, and I've learned a lot, and we've heard some good suggestions.

Mr. French, I was intrigued by your chess clock suggestion. I think that's something we ought to take a look at. And the idea of prioritizing, Ms. Meredith, that you mentioned obviously is something that needs to be looked at in terms of national security issues.

But I also, you know, join many of the Members not only in supporting the commercial space industry, I want to see it continue to sustain its growth, but we have to make sure that that's done responsibly and not at the detriment of the environment. I understand, for example, that SpaceX has launch applications pending at Boca Chica. You mentioned that, Mr. Coleman, as well as two applications to launch heavy rockets from Cape Canaveral and Kennedy Space Center and that you're reviewing those.

I—correct me if I'm wrong, but it's my understanding that SpaceX launched at least one rocket in Boca Chica without a permit and that it experienced a major rocket explosion and mishaps and that it has been cited by Texas environmental authorities for illegal discharge of launch wastewater containing many pollutants, which shows that—although, you know we don't like red tape, there may be a—I mean, there's environmental reasons behind taking a look at these launches.

Now, we are in a competition with China, but I would note that the Chinese Government hasn't shown much concern about polluting their air and water and poisoning the Chinese people. In any sense, we care more about the American people than they care about the Chinese people.

So here's the question. The cost of environmental damage are really hard to reverse, and I'm wondering, Mr. Coleman, can you explain to us what processes the FAA is going to undertake in its environmental reviews to prevent that kind of problem?

And since I'm asking you this question, I've been thinking about the resource issue. And there are other entities in government that augment their funding and, in some cases, are entirely funded by fees. For example, the patent office is entirely funded by fees. Obviously, SpaceX is owned by the richest man in the world, so there is some opportunity for increased fees to help augment the budget. I don't know if it's fair to ask you to comment on that idea. So those are the two questions to you, Mr. Coleman.

Mr. COLEMAN. Yes, thank you, Ranking Member Lofgren.

On the environmental front, as you mentioned, the environmental issues are of significant concern. The processes that we follow is that we—when there is an action that we are considering to license, for example, again, using—I'll use Boca Chica, for example. SpaceX is now contemplating increasing the number of launches from that site.

And so what we have initiated is, first of all, we've initiated a draft environmental assessment that contains our assessment of what those environmental impacts would be. We will—we've released that document to the public for public consumption, and we've also called for public meetings to bring the public into the conversation to discuss those potential impacts and what we should be considering to address those impacts.

Ms. LOFGREN. And do you also include—for example, in this case, they've been cited, I guess, by the Texas environmental agencies for polluting the water.

Mr. COLEMAN. Yes.

Ms. LOFGREN. Do you reach out to the State environmental agencies to get their feedback as well proactively?

Mr. COLEMAN. Absolutely. We have talked to Texas CEQ (Commission on Environmental Quality). We've also talked to the EPA (Environmental Protection Agency) about those violations to get their concerns. We've also updated our draft environmental assessment to account for those violations that you just mentioned.

Ms. LOFGREN. I'm—it's unfair to ask you about the fee issue because that's not something you can probably ask, but it would be helpful for the Committee to know what dollar amount would be required for you to staff up to the point where you could get these applications reviewed in the timeframe that we would all like and—but, you know, to do it—to get the job done fully, not to make shortcuts, what would that be? And then we can take a look at how we might address that outside of the appropriations process. Could you do that after this hearing?

Mr. COLEMAN. Sure. I'd be happy to.

Ms. LOFGREN. Thank you very much.

Mr. Chairman, I yield back.

Chairman BABIN. Yes, ma'am. Thank you.

Before we go to the next questions, I know we've got some folks from Johnson Space Center sitting here I wanted to recognize. Raise your hands if you're from Johnson Space Center? About half the room. Thank you all for being here. I'm very—that's right. I'm very proud to be representing you all. Thank you. I hope you enjoy your tour. Happen to be from my district, Mr. Posey, thank you. Thank you very much.

OK. I'd like to recognize the gentleman from California, Mr. Garcia, for his questions.

Mr. GARCIA. Thank you, Mr. Chairman.

I guess the bulk of my 5 minutes will be observations and statements as a former, you know, senior program director for an aerospace company that's been through some of this.

Mr. Coleman, I guess the first question though is, you acknowledge that we are in a space race with China, right? This isn't something that you don't agree with. You acknowledge that in order for

us to be competitive with China in this race, that we do need the commercial partners, and we do need to enable the commercial partners to do their jobs effectively. And, obviously, safety is a key performance parameter (KPP) in all of these programs, but time is also a KPP and something that we value as much as safety. Would you acknowledge that as well?

Mr. COLEMAN. Our fundamental focus is on public safety, national security, and foreign policy interests, and we look to make determinations as expediently as we can, recognizing that launch is important to our national security interests and our foreign policy interests. And, as you mentioned, Congressman Garcia, we do recognize the importance of making expedient determinations as we look to get to the Moon as soon as we can by March 2026.

Mr. GARCIA. Yes, it's not just important, though. It's required by law. Under part 450 you have an obligation to complete the application processes within 180 days. So you—my understanding is that, to date, we have yet to actually complete a part 450 application within 180 days. So I think from my observations as a, you know, former program director, I see that you've adopted effectively a zero-risk mentality, which isn't necessarily a bad thing, but when you do that while also not opening the aperture to ideas which Mr. French and Ms. Meredith outlined in terms of ways to go faster, ways to prioritize in the rack and stack, some of these more important national security initiatives, in accepting that zero-risk mentality, you also accept and in part a zero-success mentality and a zero-responsiveness mentality, what I would call a zero-customer-service mentality and a zero-closed-feedback-loop mentality with our commercial partners, and you're actively disincentivizing them from participating in this very important national security endeavor and science endeavor as well.

So when it comes to this issue with the clock, I am reluctant to call it a chess clock because a chess clock measures cumulative time, and that's effectively what we have right now with the 180-day requirement. I think we do need a shot clock because what's happening is you're sitting on documents from the commercial partners and waiting, you know, 30 days to get questions back to them or responses back to them. And it's—when you go back to industry for answers, they respond within 24, 48 hours, and then they give the responses back. And it's like a black hole.

I'll look at Starship 5 license approval, which you had initially promised would be issued by September 17. It then took about a week ago a shift of about 2 months to November 22, and then yesterday, you shifted the overall readiness date to November 26. And for this license modification, you're already just now 3 days away from violating the 180-day shot clock requirement.

We've heard from companies in my district, around my district, that are literally spending 10 percent of their topline revenue on this application process and the delays imparted by AST. So, you know, I'm looking for answers here. I think you've got the wrong paradigm right now, and I understand the root cause and the—you know, the head count and the funding is an issue, but as your appropriator and as your authorizer, we fully funded your request.

So the question is, what is the right—I don't like—by the way, I don't like doing things outside the Appropriations Committee

when it comes to funding. I think that's very dangerous. What is the appropriate amount? What is the headcount needed to successfully adjudicate and approve part 450 licenses by the time that is required, 180 days, by the date of 2026 where all licenses will be needed under that construct? What is the right amount? Because if you can't execute it, I would submit it shouldn't be under FAA's domain. It shouldn't be under AST. We can find other places like AFRL (Air Force Research Lab), DARPA (Defense Advanced Research Projects Agency), other go-fast agencies to man this and do it correctly. But what is the right funding level that you need to do your job successfully, which we have not been doing?

Mr. COLEMAN. Thank you for the question, Congressman Garcia. A couple points I want to make. No. 1, we have issued six licenses under part 450. Only on one occasion have we taken more than 180 days to make that determination, only on one occasion.

Mr. GARCIA. If I may, Mr. Chairman, that is contrary to the testimony by Mr. Cavossa. His written testimony suggested you have not made that a commitment—

Mr. COLEMAN. Well, I'm the regulator. Mr. Cavossa is not. I can tell you that we've made that determination on every occasion except for one. Now, Mr. Cavossa can have his own opinion, but I have the record, and I'm the regulator for that.

Now to your question about how much resource does it take, the President has—in the 2025 request has requested a discretionary increase for our office up to \$57 million in operations. That's the largest discretionary increase that our office will ever have received. And we hope that—hopefully, we'll get that in 2025. We currently have 158 staff—

Mr. GARCIA. Is that the right answer, though? It's the biggest number, but is it the right answer to actually execute part 450 correctly?

Mr. COLEMAN. Part 450 execution is dependent on a number of factors. No. 1 is having the appropriate resources that we need to execute it. Also, as I mentioned in my opening statement, industry can take responsibility and accountability as well by coming into us with applications that speak to the requirements that are robust, that are thorough such that we don't have to have multiple iterations and go-backs with industry. That takes up time. That takes up resource.

Mr. GARCIA. Thank you, Mr. Chairman. I'm out of time.

Chairman BABIN. Thank you, Mr. Garcia.

And the gentlewoman from Virginia, Ms. McClellan.

Ms. MCCLELLAN. Thank you, Chairman Babin and Ranking Member Sorensen, for this important hearing. This is a particularly relevant issue for Virginia. As you know, we are home to the Mid-Atlantic Regional Spaceport at Wallops Island, which is one of only four spaceports in the United States that is licensed by the FAA for vertical launches to orbit. And it is critical that—not only to spaceflight, but to the robust operation of that facility and all of the infrastructure that supports it, it's critical that our regulatory frameworks not only work, but protect humans engaging in spaceflight and the communities across the country that support those operations, while allowing the United States to maintain its leadership in space.

And so, Mr. Coleman, as you know, the memorandum of agreement for range coordination between NASA and the FAA is important for launch operators to have clarity about their licensing responsibilities, especially around ground safety and flight safety. Can you provide an update on the status of this memorandum of agreement?

Mr. COLEMAN. Certainly. Thank you, Congresswoman, absolutely. The—and, first of all, these memorandums of agreement are very important. As was mentioned earlier, Space Policy Directive 2 directed Federal agencies such as Department of Transportation, the Space Force, as well as NASA, to minimize duplication of effort and to streamline our concerted efforts to oversee and work with this industry.

We are working on a memorandum of understanding or agreement with NASA right now. It is being drafted. We are pushing hard on that. We certainly want to see that such that we can have clear understanding and delineation of roles and responsibilities for launch service providers that are conducting operations at NASA ranges such as NASA Wallops in Virginia.

We have responsibility for public safety, not only for public not involved, but for the public that's present on the facility itself, even NASA employees.

Ms. MCCLELLAN. Right.

Mr. COLEMAN. And so we're carving that agreement out. We're pushing forward. It is very important for the progress of operations that are being contemplated at the facility that you asked about.

Ms. MCCLELLAN. Thank you. And can you tell us what steps the FAA is taking to support a cadence of regularly scheduled commercial space launches at Wallops?

Mr. COLEMAN. Well, first of all, I think Wallops is an excellent facility, and I was just there a couple of weeks ago, had an opportunity to meet with leadership there and talk about just what you're asking about, how we can work with the leadership there to increase the cadence of commercial activities there. We're also working with the Mid-Atlantic Regional Spaceport there. They have outstanding leadership. General Ted Mercer, who leads that organization, is doing an outstanding job of pushing for more commercial operations at that site.

We're working with the companies such as Rocket Lab, for example, to ensure that we are licensing their activities in a timely enough fashion, supporting what they're looking to do such that there can be more commercial activities from that facility.

Ms. MCCLELLAN. Thank you.

And, Mr. Cavossa, can you—one of the things I like to do when I'm back in the district is help to connect the work that we're doing here in Washington and then specifically on this Committee with what's happening in their lives. And while Wallops is not in the 4th District, commercial space flight does have an impact. So can you describe the impacts that the launch and reentry regulations would have on the everyday lives of not only my constituents, but people around the country that don't have these facilities in their districts?

Mr. CAVOSSA. Sure. Thank you for the question. Sort of noted earlier, but everything that makes up the commercial space indus-

try today, whether it's satellite communications, GPS (Global Positioning System), national security, human spaceflight, remote sensing, Earth observation, environmental data we're receiving today, all of it is being launched into space through our member companies from these spaceports around the country as well. And licensing slows the process down for new entrants as well, for competition, for new launch vehicles. The drag I referred to before of licensing could potentially have a dramatic impact on new launch vehicles entering the marketplace, new players entering the marketplace, new companies getting funding to enter the marketplace, and that affects the commercial space industry and all the benefits that we provide the United States and your constituents.

Ms. MCCLELLAN. Thank you.

Mr. Chair, I yield back.

Chairman BABIN. Thank you, ma'am.

I'd like to recognize the gentleman from Georgia, Dr. McCormick.

Mr. MCCORMICK. Do you mind Mr. Strong—

Chairman BABIN. OK. Mr. Strong, you'll go next then.

Mr. MCCORMICK. Thank you, sir.

Chairman BABIN. OK.

Mr. STRONG. Thank you, Mr.—Chairman Babin, Ranking Member Sorensen.

Companies in north Alabama rely on clear and consistent FAA regulations to deliver space-based capabilities for their customers. Mr. Coleman, I'd like to know how your office plans to keep pace with the increased cadence and complexity of commercial space transportation operations. You testified earlier that you have roughly 30 to 40 active applications currently pending under the part 450.

Mr. COLEMAN. Thank you for the question, Congressman. It is certainly a challenge to keep pace with the demand that we're seeing. No. 1, we went on a very aggressive campaign this past year to hire additional staff that we needed in technical areas that serve the licensing process, bringing on more flight safety analysts, more system safety analysts, more engineers to support what—the work that we're doing. We're in a fierce competition for those resources with NASA and DOD, as well as the companies that we regulate. A flight safety analyst, for example, are—is a skillset that you don't necessarily learn in school. You learn it through experience, and so we are in a fierce competition to bring those resources on. That's No. 1, the resource piece.

No. 2, we are trying to work with industry to the extent that we can help to industry understand what needs to be done in order to demonstrate compliance with part 450. We've issued 17 advisory circulars last year. We're on pace to issue up to 10 this year, and hopefully, those advisory circulars will serve as tutorials that will help the industry better understand what compliance for 450 looks like.

Mr. STRONG. Thank you. To what extent is licensed prioritization—the prioritization affected by whether the application is within the 180-day evaluation stage?

Mr. COLEMAN. If I understand the question, Congressman, prioritization really has to do—well, let me put—say this first of all. Ten years ago, we weren't even talking about prioritization.

Prioritization has only come into play as the amount of work that we are faced with is being challenged by the availability of resources that we have to do that work.

We certainly take a look at national security concerns. We take a look at our civil space exploration concerns, and we certainly put those concerns at the very top of the heap when considering having to make choices in terms of what work gets done and when it gets done.

Mr. STRONG. Thank you. Once a site or a vehicle operator enters the 180-day evaluation stage, are they allowed to make modifications to their license?

Mr. COLEMAN. They are, and they have. It was mentioned by Ms. Meredith that we, from time to time, stop the clock. We call that tolling. That gives the applicant an opportunity to correct an error or to provide missing information that, if it weren't presented, we would wind up with a denial of the application. We are giving the applicant an opportunity to fix it and to demonstrate compliance. A tolling is a positive thing that we leverage during the 180-day clock to give the applicant an opportunity to get to a yes answer.

Mr. STRONG. Thank you. Associate Administrator, I understand that your office has not yet gone back to 100 percent return-to-work policy. Given the increased demands for part 450 licenses, what operational and day-to-day procedural changes can you—can your office make to manage the demand? We're going to the Moon and we're going to Mars and we've got to get to work.

Mr. COLEMAN. Absolutely. I agree with you 100 percent. We have a dedicated professional team that's hard working. They are working full-time. They have all returned to work. They all are working full-time. However, as most Federal agencies are faced with challenges in the aftermath of the pandemic, we have—you know, of course, have some situations where we don't have everyone in the office every day. We have remote work from time to time. We have people who work from home and telework. But with that being the case, we are managing the productivity of our staff and ensuring that we are getting full productivity from our staff in the face of a new environment in which we're working.

Mr. STRONG. Thank you. Mr. Coleman, there are companies my district who have been working to get a reentry license since 2016. I understand that they have met safety calculations. What is preventing Sierra Space from getting a permit to land at the second largest airport in the Southeast United States? Do you believe that more than 3,000 days—is that long enough to get a permit?

Mr. COLEMAN. It certainly should be. But what's important is what—you asked the question, what's keeping them from getting a permit?

Mr. STRONG. Correct.

Mr. COLEMAN. Demonstration of the requirements, compliance with the requirements. That's what's keeping them from that. Now, we're working with Sierra Space to help them understand what they need to demonstrate and show insofar as means of compliance is concerned, and we've had a number of conversations with them, and they're making good progress, and we hope to get them licensed soon.

Mr. STRONG. Well, I can tell you this right here. We want to be first. There's no doubt about it. I want to be safe, but I do have concerns. When this application's been active since 2016, it's time to move forward, and I want to do anything I can to help. I'm not sure if additional employees is the solution. I do think that we need to get back to work and put the American space program No. 1.

Mr. Chairman, I yield back.

Chairman BABIN. Yes, sir. Thank you very much.

I'd like to recognize the gentlewoman from Michigan, Ms. Haley Stevens.

Ms. STEVENS. Thank you, Mr. Chair. And thank you, Mr. Ranking Member, for allowing me to waive onto this Committee.

Mr. Coleman, you're an Associate Administrator, and I'm just curious, who do you report to?

Mr. COLEMAN. The FAA Administrator.

Ms. STEVENS. OK. The Administrator overall. And I just want to commend you, sir. I really believe that you've had a tremendous career, and you are a true steward of the government and public service. And I want to thank you for your dedication to your practice.

As I've been listening to today's hearing, what is clear and evident is that we are in a bureaucratic soup by no individual's fault other than the lack of willingness to lead. We, as Members of Congress, can ask all the questions that we are asking and push forward the vision that we want to get to the Moon, and that feels good to say, and we want to be first, and we want to be ahead, but until we have the strategic coordination of government coming from a paygrade higher than yours, sir—and I appreciate who you report to and the pressure on the FAA overall and what's going on in commercial spacecraft, to our commercial aviation industry, to small flight craft sectors across this country, frankly, that are training people how to fly, and it's really exciting to see that.

But, Mr. Coleman, you announced that AST would establish an aerospace rulemaking committee, or SpARC, regarding part 450, and this announcement was met with tremendous industry support. However, SpARC is still yet to be established. Moreover, given the average SpARC can take years to produce recommendations, as we've been kind of uncovering here today, I worry that the window to make meaningful impact to part 450 before the 2026 transition or promulgation of new human spacecraft regulations is quickly closing.

So, Mr. Cavossa and Mr. French, in both your testimonies, you state that AST should expeditiously establish SpARC, this group. Can you please explain while this SpARC—why this SpARC is so important to resolving part 450 issues? What are we going to get from that?

Mr. CAVOSSA. Thank you. The SpARC is an extremely important long-term solution. As you noted in your question and your statement, it's going to take some time to stand it up and work through these issues and come up with recommendations. So we are very much supportive of a SpARC as soon as possible. But a lot of what we're talking about today, and in my testimony in particular, are some near-term, immediate process fixes that the FAA can do. The

SpARC is part of the long-term solution. It has to happen. But there's also things that can be done today outside the SpARC.

Ms. STEVENS. Yes. And maybe we should send a memo to the White House, right? I mean, let's just get them talking about SpARC and this national imperative and the things that we need to do because I trust the people who go in to work every single day on behalf of this government only have the best interest in mind, but something is stopping this process. And we know we're not getting to the Moon unless we have commercial spacecraft, so something's not working here. And I don't know if we're going to solve it in this Committee, but we hope that people are hearing us.

French, would you like to get in here?

Mr. FRENCH. Sure. Thank you. The one thing with the SpARC is we have currently two going on right now. There's one on 440, which is about indemnification and insurance regimes, and the other is on the human spaceflight regime. Having, you know, served as a member or served as a member in both those SpARCs, what they provide is an environment to—for companies to provide detailed recommendations outside of sort of the pure public sphere, which I think will—is able to lead to recommendations that AST can implement sort of more completely.

Ms. STEVENS. OK.

Mr. FRENCH. So that's the—

Ms. STEVENS. So there's some promise. OK.

Mr. FRENCH. Absolutely.

Ms. STEVENS. OK. Well, we'll dig on that.

And then, Mr. Cavossa, in your testimony, you highlighted the potential benefits of this bipartisan amendment I've been involved in with my colleague, Mr. Garcia. This was offered about a year ago in last fall's markup of the *Commercial Space Act of 2023*. And the amendment seeks to provide new authorities to FAA AST to expedite the processes and support industry competitiveness. And, Mr. Cavossa, can you just describe why you're—you are supportive of this amendment?

Mr. CAVOSSA. Sure. I mean, everything we've discussed today about the challenges and the drag on the commercial space industry right now are very well addressed by your amendment and by that piece of legislation, so it helps move things forward. It helps focus the FAA AST office on exactly the issues we think need to be addressed immediately.

Ms. STEVENS. Yes. Well, and just in reflecting in my first term in this Committee, we celebrated and acknowledged the 50 years since the Moon landing, the first Moon landing, and you think back to that amazing history of what it took to get us to the Moon. It wasn't this stuff, folks. It wasn't this. And I'm not knocking anybody because I think you're all professionals and you're all dedicated to your charge, but we cannot look back and say we were pushing papers and needling and waiting for SpARC and 450 and 440 and all these different numbers. We have to set the mission, and it's got to come from the top.

And so I'm here to work with my colleagues on both sides of the aisle to push that forward and to see us succeed safely, responsibly. We also know some of the pressures that have been going on in

FAA outside of commercial, and I'm—we can maybe get to that off the record.

So with that, Mr. Chair, I'm going to yield back. Thank you for the important hearing.

Chairman BABIN. Thank you very much.

I'd like to recognize the gentleman from Georgia, Mr. McCormick.

Mr. MCCORMICK. Thank you, Mr. Chair. I appreciate you, and thanks for being here today. Congratulations, by the way. You found something that united the Democrats and Republicans. Unfortunately, it's our dissatisfaction with the FAA and the approval process right now.

For the first time in history, at least since maybe the Roman era where Pompeii could raise his own army and buy his consulship, we have civilians outperforming the U.S. Government. One person in the United States can put more spaceships into the stratosphere than the entire governments of all the world combined. So if we're going to be competitive, it's not going to be through NASA anymore. It's going to be through our industry.

The problem is when you have different programs such as SpaceX, ULA, Blue Origin, and others that have redefined space travel, who just launched the Polaris Dawn this morning and are going to do the first spacewalk with civilians, if we start holding up that process, we lose our edge in this world market that is extremely competitive. We lose against China, we lose against Iran, we lose against Russia. This is our place in history that we are grabbing or losing.

Tell me, when we put all these spaceships, more than anybody else in the world already up there, why the same process that we use to approve that all of a sudden has something changed? Is there a reason that we're holding up the same process that's already been approved previously? These 27 I think you said advisories, 17 in 1 year, 10 the next year, that you put out in the last 2 years, how much has that sped up the process? How much have you internally looked at to speed up the process? How have you been accountable for passing the very people—the process of licensing to make us competitive on the world market, which is maybe your most important thing that you do? Please. Yes, Mr. Coleman.

Mr. COLEMAN. Thank you, sir. Thank you, Congressman.

Safety is our focus. That's why we're in business.

Mr. MCCORMICK. So real quick, I just want to refocus what you're saying right now. Are you saying that these people that put in their license applications who are already doing what they're doing and they're asking for exactly what they've already achieved, what you've approved them from the process before, what has changed that's holding them up?

Mr. COLEMAN. Well—

Mr. MCCORMICK. It's not safety. Let's—

Mr. COLEMAN. I'll give you an example. I'll give you an example.

Mr. MCCORMICK. Good.

Mr. COLEMAN. Let's take Starship, a super heavy, Boca Chica. We issued a 450 license to SpaceX for that activity. You ask what changes? Missions change. Technologies on the vehicle change,

which require a modification to the license. Four-fifty is designed to approve a suite of missions.

We should not—well, I shouldn't say we should not. It is our intention with 450 to not have to come back to deal with modifications at such a frequent basis. We're up to the fifth flight now. We have four flights—SpaceX has four flights under its belt, three of which have been under modifications to the license that have been requested by the company. It is the company that is pushing mission-by-mission approvals. That's what's the pace is about.

Mr. MCCORMICK. So you do realize that technology changes literally every day. This is the leading-edge technology in the world, whether it be AI (artificial intelligence), quantum, space exploration. Once again, these are individuals taking their own risk. It's like when we threw our family in the back of a wagon and went West. We might freeze, we may starve, we may be killed, but we're taking a chance for the betterment of our family or our society or our business. That's the American way.

Like I said, you talk about safety. I think every company is—very much understands that if they're not safe, they go away. They go extinct. They are policing themselves. Who are we to get in the way of progress? I ask you to streamline your process because I think if you don't, we fall behind, and our very way of life is in jeopardy.

You're in charge. You make the difference. You get to determine how fast these go through. And if what you're doing is not working, you need to change. Does that make sense?

Mr. COLEMAN. I appreciate the comment, Congressman. We are doing the very best job that we can, as I mentioned in my opening statement, to enable safe space transportation at a pace that meets our needs. We—but we cannot enable safe space transportation by setting aside demonstration of compliance with the regulatory requirements and safety. That's very important. So I appreciate what you're saying insofar as what our responsibilities are and the powers that we have to make these things happen, and we're doing our level best to do that. We're working with industry to help them better understand what compliance against part 450 looks like, and hopefully, they will take our advice and move in that direction.

Mr. MCCORMICK. So I'll conclude with this, and I'll yield my point, sir. If I thought that your regulation, which I know you guys are the regulatory bureaucracy—if I thought your regulation was making us safer, I would agree with you. I just haven't seen that traditionally. I've seen a lot of space missions held up because of something that really had nothing to do with safety, just regulation. And regulation is killing American business from top to bottom, not just in this industry, but all across America, and that's what I want to see cut so we can actually make advancements and stay competitive.

With that, I yield.

Chairman BABIN. OK, sir.

Now, I'd like to recognize gentleman from Florida, Mr. Webster. Mr. WEBSTER. Thank you, Mr. Chairman.

Mr. Coleman, back I think in February, AST announced that they wanted to have an advisory group, which we've been talking about. And that group is going to be appointed to look for changes

or get testimony or just check it out and see what changes need to be made. As of yet, that group isn't appointed. Is there some sort of reason behind not—having not done that?

Mr. COLEMAN. Thank you for the question, Congressman. I announced in February during our commercial space transportation conference that we would be standing up this aerospace rule-making committee that you're asking about, and I stated that we would have it in place by the end of summer, by early fall. We still have a few weeks left. It's not quite the end of summer yet. We haven't quite gotten into the fall yet, so I think we're still on schedule. I can tell you that the charter has been drafted. It is being reviewed, and we hope to have it set up in short order.

Mr. WEBSTER. So is that timeline still effective and that you'll have it by that deadline?

Mr. COLEMAN. We're pushing to have it stood up as soon as we can. We're close to getting that approved, and hopefully, we'll get that started ASAP.

Mr. WEBSTER. So, also, one of the goals of part 450 process to allow multiple launches and to get permitting for that. As of yet, I—there might be some, I don't know, but I don't know of any. Is there some reason why that's not taking place?

Mr. COLEMAN. I don't know the full reason as to why it's not taking place. Each of the six licenses that we've issued for part 450 have been for individual missions. We would like to see more planning done up front, more methodologies that will cover a broad swath of missions that we can consider. But I think what often-times happens is companies are up against a launch date, and with a launch date looming, it becomes the easy solution to say, well, we will dial back our applications to a single mission versus a broad suite of missions. And so we've had some companies that have put a number of missions on the table, but as launch dates have approached, those applications have been dialed back to individual missions. I would like to see more utilization of the features that are available in part 450, which allows us to approve a large suite of missions such that we don't have to have as many modifications and go-backs with companies when they want to change a mission.

Mr. WEBSTER. Thank you very much. So do you think that's something in the future, that there's going to be multiple launches approved at one time?

Mr. COLEMAN. I absolutely believe that. I would like to just remind the Committee, part 450 is only 3 years old. This is still a very new regulation. I think 5 years from now and 10 years from now, we will have hit our stride with it, and these conversations will be long in the rearview mirror. But it is a new regulation that we have to get our arms around to a greater extent, the industry has to get its arms around to a greater extent. There is learning all around.

We are doing things on our side like implementing SMS (Safety Management Systems) for licensing where our engineers will have decision trees that they can utilize to figure out, you know, the level of risk that's associated with the review and what decisions they need to make in association with what they're seeing. So we

are equipping our organization with the tools that it needs as we continue in our quest to implement part 450.

Mr. WEBSTER. Thank you very much. I yield back.

Chairman BABIN. OK. Thank you.

Now, the gentleman from California, Mr. Vince Fong.

Mr. FONG. Thank you, Mr. Chairman, for letting me waive on to the Subcommittee for today's hearing. Just a few questions for Mr. Coleman.

You—I want to delve into your—the answer to the last question you pointed out, which is one of the goals of the part 450 process was to allow for multiple launches and reentries under a single license. And, as you mentioned before, of the 450 licenses that have been approved, most have been approved for a single launch or a single reentry. You know, how can we facilitate the expansion of that to allow for multiple launches, and what's the hangup?

Mr. COLEMAN. I think, No. 1—I think most companies that are approaching part 450 underestimate the work that is required to establish and show and demonstrate means of compliance that are—that meet our requirements. This is what is fundamentally different in part 450. It's performance-based. We set risk criteria that must be met, but we allow companies to come in and show us the "how" versus us prescribing the "how."

Mr. FONG. So can I ask—can I delve a little deeper? What's different between the launches? You mentioned—I mean, is there something specific that you're looking for, for each launch that's unique to each one?

Mr. COLEMAN. You mean, what's different in causing us to go from mission to mission—

Mr. FONG. Yes, you're saying that, yes, that it's delayed because you're asking for the stakeholders to do more. But what is distinctly different from each launch that you're looking for?

Mr. COLEMAN. Well, you know, for each mission or for a suite of missions, companies have to come in and show us means of compliance, for example, have to show us flight safety methodology, how are you going to demonstrate that, et cetera. There's a substantial amount of work to be performed and demonstrating that. Also, I think there is a substantial amount of planning that needs to be done such that companies have an idea that looks far enough in the future or far enough ahead that we can account for under licensing and allow the time it takes for us to work through means of compliance and get those things settled before we turn the clock on.

Mr. FONG. So understanding that answer then, the FAA reports that, when fully implemented, part 450 will reduce how often operators must apply for an FAA license. So how do I juxtapose the answer you just gave me to the goal that the FAA is trying to get to, which is that the operators would actually apply less—will reduce how often the operators will apply for a license? Because if you keep asking for this—for the same thing, but the goal is to actually allow the operators a streamlined process to interact and get a broader license authority to do more launches, how does that comport together?

Mr. COLEMAN. Could you repeat the question for me, Congressman?

Mr. FONG. So you're saying that the challenge with multiple launches and multiple entries under single licenses, you're requiring more information from the commercial space company. But then the goal is to actually have the operators—to reduce how often the operators must apply for an FAA license. So if you're going to require all this information for every single launch, but the goal is actually to have them interact with you less, how does that go together?

Mr. COLEMAN. Well, actually, the goal is when they come to us initially with this information, that this information will cover multiple launches, not a single launch, but multiple launches. And so we're looking to approve methodologies. Once we can improve your methodologies for achieving safety, go off and conduct as many launches as you need to as long as you're following those methodologies.

What we're encountering is we're encountering applications that only address a single mission versus a suite of missions. And so we are looking—to get to the solution piece of this, we are looking to push advisory circles to help companies understand what compliance looks like, what a good methodology looks like, what the means of compliance should entail and focus on in order to demonstrate compliance with our regulations.

Mr. FONG. OK. And my last question, you mentioned earlier the need to prioritize and so—and you mentioned national security implications. So when they—when DOD or NASA or another Federal agency says that a launch is a priority for them, how does that in practice happen when you prioritize a launch?

And with that, I'll yield back.

Mr. COLEMAN. Well, you know, we look very carefully at the missions, and we fully support and prioritize missions that support our national security concerns and our civil space exploration needs, missions that are providing critical cargo to the International Space Station (ISS) to support our astronauts on the space station or to deliver crew to the space station are the types of missions that typically we put a lot of focus on, a lot of resources on to ensure that those missions occur.

Mr. FONG. Do they move to the top of the list? If the Chair may let me ask that question.

Mr. COLEMAN. Yes, if there's a critical need to get food or other materials to the International Space Station to support our astronauts on the space station, absolutely, those missions are pushed to the front.

Chairman BABIN. All right. Thank you. The gentleman's time has expired.

We're going to go back through for our second round, and this time we're going to have 2 minutes to get your questions in and answered.

And so I will ask the first one, and I'm going to direct this to Mr. Cavossa.

Mr. Cavossa, in your opinion, is it currently possible to comply with part 450 requirements when it's related to reentry? And if no, why?

Mr. CAVOSSA. Thank you for the question. It sort of gets into some advanced technical details and conversations here, but, as I

understand it, when 450 was created, it was very much focused on the launch aspect and reentry was thrown in, and we tried to develop regulations where both launch and reentry could be handled by the same part 450. It is much harder, as FAA noted, in the rule to comply with the conditional expected casualty calculation if you are reentering for some of our vehicles. In particular, some of our vehicles have a very long reentry path when coming from the International Space Station. And the current way part 450 is written with this—again, this conditional expected casualty calculation, it is extremely difficult to meet the requirement when we're reentering the way we do.

Chairman BABIN. Thank you very much. I'll yield back.

And let's see. We will go to our Ranking Member, Mr. Sorensen.

Mr. SORENSEN. I did want to touch a little bit on NASA's decision to return astronauts Butch Wilmore and Suni Williams from the ISS on a Crew Dragon rather than a Boeing Starliner flight test vehicle. I think commendation needs to be presented to NASA and to Boeing for their commitment to prioritizing safety. This has been a riveting Space Subcommittee hearing, and so if those astronauts Wilmore and Williams are watching, many thanks for their heroic teamwork, their patience, their flexibility on the crew flight test mission as we look forward to their safe return home, and also the sacrifice that their families are making.

And I did want to continue the questioning from our Chairman to you, Mr. Coleman. You know, as we look forward, as we are learning as we go, how can we make sure that part 450 can meet the needs for reentry?

Mr. COLEMAN. Well, that's a great question, Congressman. We are looking at the very issue that was raised there. We understand—well, let me say this first of all. When we published 450, we knew it was not a perfect rule to start with. We knew that we would find—as we went along in its implementation, that we would find some kinks, and this is one of them that we've uncovered. And so part of the assignment for the SpARC that we're going to stand up is to look at the conditional expected casualty requirements and how those apply to reentry vehicles. And so we're looking very much forward to this SpARC, we're looking forward to its recommendations, and we look forward to implementing the recommendations and toward making part 450 a better rule.

Mr. SORENSEN. Thank you for that. I appreciate the way that you said that this is an assignment. So, as Congress goes forward in the next couple of days to—concerning a continuing resolution of our funding, how does that impact what we do and meeting our needs to completing the assignment? And I'll open that up to anyone.

Mr. FRENCH. You know, I'll jump in here. I think from an AST perspective, the—any sort of lapse in appropriation or delay in appropriation limits the ability for them to start the hiring process. I think we've talked a lot about today about the broader implications of a space race in our competition. I think from a national security space perspective, you know, any sort of delay in appropriations is probably our No. 1 self-inflicted wound in our competition and maintaining our lead with our adversaries.

Mr. SORENSEN. Thank you. I yield back.

Chairman BABIN. Thank you.

And now I'd like to recognize the gentleman from California, Mr. Garcia.

Mr. GARCIA. Thank you, Mr. Chairman.

Again, I just want to be very clear, Mr. Coleman, that I don't think any of us are asking you to run with scissors. We're not asking you to make safety not be the No. 1 priority, but we are asking that you maybe don't adopt a zero-risk mentality, but also recognize that speed is also life, and that every day that we slide these launches or these recoveries is literally impacting in ripples into programs that are extremely important like Artemis, et cetera. So I think you guys understand that. I just—I'm not sure at the worker level when they're processing these licenses that they truly appreciate the national security implications.

You mentioned that companies are trying to make a launch date, and I would submit to you that this country are—is trying to make the launch dates, and I think that's the paradigm shift that we need. I am not convinced that this is the right agency to be doing this mission. We can take that discussion offline.

I will submit for the record a question asking you what your current headcount is dedicated to processing part 450, licenses and then what the Fiscal Year 2025 request—and we're almost Fiscal Year 2026 President's budget release as well, so what the headcounts in those budget requests will look like.

I will state, though, that you said Fiscal Year 2025 request was a record high. It is a record high. It's \$57 million, but 10 percent of that is to fund the orbital human spaceflight and mission authorization scope that you don't currently have authorization for, so about \$6 million or so of that is for that. So that is not authorized, and so hopefully you're not banking on the come for that money to solve this problem.

I just want to reiterate that we need our commercial partners to do this. I also want to inquire as to whether the FAA Administrator, Mr. Whitaker, is aware of these issues with part 450. Are there program management reviews at the FAA level that rise to his level? And we'll submit more detailed technical questions and program management questions for the record, but would respectfully request timely responses to those if we can. Thank you.

Chairman BABIN. Thank you.

Mr. Fong, do you have any more questions?

Mr. FONG. Yes, I just have a few more if the Chair will indulge me.

Chairman BABIN. Sure. You're recognized.

Mr. FONG. But just broadly speaking, Mr. Coleman, I mean, do you have a concern that your office's licensing delays are impacting national priorities?

Mr. COLEMAN. Certainly, we are under constant pressure, increased pressure to meet all of our demands. I'll put it simply, Congressman. We don't have enough resource to keep pace with all of demand that is coming our place—way simultaneously. And so, yes, we are concerned. We need the resources. We need cooperation and engagement from industry, as I mentioned in my opening statement, to come to us with applications that are thorough and robust at the onset.

We don't have the capacity to, what I loosely say is, handhold with industry to ensure that their applications are complete and that they are good enough to eventually be accepted for licensing. Those days are behind us, so we're going to have to continue to work with industry to help industry better understand what's needed for part 450 so we can push ahead, and we also need the resources at our disposal to meet demand.

Mr. FONG. If I could ask that the rest of the panel, the three other panelists, to, I guess, address my original question, which is if the goal of part 450 is to allow for multiple launches and reentries and, as Mr. Coleman said, that somehow there's lack of information being provided by the commercial space entities, is that true on your end? And what can be done to streamline that process?

Mr. CAVOSSA. On behalf of the industry, there are very few things in my 20 years in space industry that have gotten everybody on the same page, and one of them is export controls and the challenges they have on the industry. And the other is the challenges we are having with part 450 right now. And the conversations and the technical interchange meetings between industry and the FAA during that preapplication process, there definitely seems to be a challenge here with our view of what's going on and the FAA's view of how they're handling it. We don't seem to be on the same page there.

Mr. FRENCH. Yes, I think as far as the multiple license or single license, I think because you have the challenges of meeting the requirements at a single mission basis, it's almost a sort of a step too far to sort of, now, hey, let's go tackle the multiple missions, right? So in sort of a—it's—I think it's sort of an expediency choice, right? If you sort of look at that you need to get a license met—while there is this optimal path of a multi-missions license, there's an expediency route of simply trying to meet the license today.

That also, I think, reflects in the growing importance of these advisory circulars, right, because the advisory circulars were intended to be one means of compliance, but operators are saying, if this is a way we can do it, perhaps it's suboptimal, but we're going to look to that as guidance as next—as—to expedite things. So I think that's probably why we are where we are in that question.

Ms. MEREDITH. Well, I ask myself if a means of compliance or method of compliance is acceptable for one launch, why is it different for several launches? That is not clear to me, unless the several are different from the first or the next ones are different from the first.

Mr. FONG. Thank you very much. I yield back.

Chairman BABIN. Yes, sir. Thank you very much.

I want to thank the witnesses for their valuable testimony today and the Members for their questions. The record will remain open for 10 days for additional comments and written questions from Members. And I think this has been a very valuable Subcommittee hearing today.

So with that, we stand adjourned.

[Whereupon, at 11:55 a.m., the Subcommittee was adjourned.]

Appendix I

ANSWERS TO POST-HEARING QUESTIONS

ANSWERS TO POST-HEARING QUESTIONS

Responses by Mr. Kelvin Coleman

U.S. HOUSE OF REPRESENTATIVES
 COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

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

Mr. Kelvin Coleman, Associate Administrator for Commercial Space Transportation, Federal Aviation Administration

Questions submitted by Chairman Brian Babin

1. How many applicants are currently engaged in the pre-application consultation phase? How many Part 450 applications have been submitted but have not yet been accepted by FAA? How many applications are currently under review?

FAA Response: As of December 2024, FAA’s Office of Commercial Space Transportation (AST) has 26 projects in the pre-application consultation phase—16 new part 450 application projects and 10 part 450 transition projects for existing launch and reentry operators. Additionally, AST has received two Part 450 applications, one for Sierra Space and another for RocketLab Neutron, that are currently being screened by AST to determine if the applications are complete enough to accept. AST has also accepted one part 450 application for Blue Origin New Glenn that is under evaluation by the AST licensing team. Additional information related to these metrics is provided below.

Applicants with No Submissions: 3

These applicants have not submitted an application but are receiving consultation services from the AST pre-application consultation team.

Applicant	Intended Regulation	Type
The Space Perspective	450	Launch Vehicle Operator (Suborbital)
Worldview	450	Launch Vehicle Operator (Suborbital)
Astra (Rocket IV)	450	Launch Vehicle Operator (Orbital)

Applicants with Means of Compliance (MOC) Submissions: 9

These applicants have submitted only the MOC for FAA acceptance per § 450.35. These applicants have not submitted a full application.

Applicant	Intended Regulation	Type
STOKE Space Tech. (Stoke Rocket)	450	Launch Vehicle Operator (Suborbital)
Avio USA (FD1)	450	Launch Vehicle Operator (Suborbital)
Northrop Grumman (MLV)	450	Launch Vehicle Operator (Orbital)
Outpost (Ferry)	450	Reentry Vehicle Operator
Phantom Space (Daytona)	450	Launch Vehicle Operator (Orbital)
Vaya (Dauntless)	450	Launch Vehicle Operator (Orbital)
Relativity (Terran-R)	450	Launch Vehicle Operator (Orbital)
SpaceWorks (RED Capsule)	450	Reentry Vehicle Operator
Virgin Galactic (SpaceShip Four)	450	Launch Vehicle Operator (Suborbital)

Applicants Nearing a Complete Application: 4

These applicants have submitted an application; however, the FAA has found it to be incomplete. The FAA is holding these applications and providing the applicant feedback to reach a complete application.

Applicant	Intended Regulation	Type
The Spaceport Company	414	Safety Element Approval
Sirius (ASCA Hopper)	437	Launch Vehicle Operator (Suborbital)
Sierra Space (Uncrewed Dreamchaser)	450	Reentry Vehicle Operator
Rocket Lab (Neutron)	450	Launch Vehicle Operator (Orbital)

Legacy Operators Transitioning to Part 450: 10

These legacy license holders are engaged in pre-application consultation to transition application material from legacy regulations to part 450. Some companies have multiple operator licenses (i.e. SpaceX) which will transition to a single part 450 license supporting multiple vehicles and launch sites.

Applicant	Intended Regulation	Type
ULA Atlas (415/417)	450	Launch Vehicle Operator (Orbital)
ULA Vulcan (415/417)	450	Launch Vehicle Operator (Orbital)
Boeing CST-100 (431)	450	Reentry Vehicle Operator
Firefly Alpha (415/417)	450	Launch Vehicle Operator (Orbital)
Rocket Lab Electron (415/417)	450	Launch Vehicle Operator (Orbital)
Northrop Grumman Antares 330 (415/417)	450	Launch Vehicle Operator (Orbital)
Exos Sarge (431)	450	Launch Vehicle Operator (Suborbital)
SpaceX F9 (415/417)	450	Launch Vehicle Operator (Orbital)
SpaceX Dragon (435)	450	Reentry Vehicle Operator
Blue Origin New Shepard (431)	450	Launch Vehicle Operator (Suborbital)

2. Under Part 450 of Title 14, Code of Federal Regulations, an applicant for a launch or reentry license must go through a pre-application phase before the applicant can formally submit its application. When the applicant formally submits its application, FAA first screens the application to determine whether it is “complete enough” to allow FAA to conduct its review. Section 50905 of Title 51, United States Code, directs the Secretary to decide whether to grant an application for a license “not later than 180 days after accepting an application”. However, the time spent in pre-application consultations and any time before FAA determines that the application is complete enough for review do not count towards these 180 days, because they occur before FAA acceptance of the application.
 - a. For each Part 450 license that has been issued, denied, or is currently under review, please provide the following—

- 1) The date the applicant initiated pre-application consultations.

FAA Response: See “Start of Pre-Application Process” column in the table below.

- 2) The date the application was submitted to FAA.

FAA Response: See “Application Submitted” column in the table below.

- 3) The date the FAA accepted or did not accept the submitted application.

FAA Response: See “Application Accepted” column in the table below.

- 4) For any applications not accepted, whether the applicant edited and resubmitted the application, and if so, the date on which such application was resubmitted.

FAA Response: In general, applications were accepted after changes were made to the initial applications based on FAA feedback. The FAA typically holds the application while the applicant generates the requested updated information. See “Notes” column in the table below for additional information.

- 5) The number of days, if any, that the 180-day review period was tolled and the reason(s) for any such tolling.

FAA Response: See “Notes” column in the table below.

- 6) The date the license was granted or denied, if applicable.

FAA Response: See “License Approved” column in the table below.

- 7) The date the first licensed launch or reentry activity took place or is scheduled to take place under the license, if applicable.

FAA Response: See “First Ops Date” column in the table below.

- 8) The total time between start of the pre-application process and grant of the license.

FAA Response: See “Days Elapsed” column in the table below.

Applicant, Vehicle	Start of Pre-Application Process	Application Submitted	Application Accepted	License Approved	First Ops Date	Days Elapsed	Notes
ABL Space, RS-1	7/1/2020	7/23/2021	7/23/2021	11/13/2022	1/10/2023	Pre-App to Accepted Application: 387 days Application Accepted to Determination: 478 days	Application accepted immediately upon receipt. At 120 days into the evaluation, the application was missing information for the following: Safety Critical Personnel (450.149), Control of Hazard Areas (450.161), Flight Safety Analysis Methodologies (450.115), and Flight Safety System (450.145). Application tolled for 306 days, from 1/11/2022 to 11/9/2022. The FAA ultimately processed 1 waiver to 450.115, and 7 waivers to the Flight Safety System (FSS) MOC. Prior to this license, ABL had no experience developing rockets or obtaining an FAA license.
Astra, Rocket 3.3	7/26/2021	10/28/2021	10/28/2021	2/4/2022	2/10/2022	Pre-App to Accepted Application: 94 days Application Accepted to Determination: 99 days	Application accepted immediately upon receipt. Astra utilized Federal Range Services (SLD 45), which streamlined the evaluation. Prior to its part 450 license, Astra had experience operating under 415/417.
Relativity, Terran-1	9/16/2020	4/30/2021	08/21/2021	02/21/2023	03/22/2023	Pre-App to Accepted Application: 339 days Application Accepted to Determination: 270 days	First application submission deemed incomplete on 5/18/2021 due to systems safety (450.107/109) and computing systems (450.141). Second submission accepted on 8/18/2021. Relativity's application was tolled twice for a total of 272 days, from 12/23/21 to 3/29/2022 and from 4/18/2022 to 10/11/2022 for numerous unresolved application deficiencies including absent critical information pertaining to flight safety analysis (FSA), flight termination systems, and computing systems.

5

SpaceX, Starship-Super Heavy	09/29/2020	2/10/2021	10/7/2021	4/14/2023	4/20/2023	Pre-App to Accepted Application: 373 days Application Accepted to Determination: 554 days	Initial application received 2/10/2021, SpaceX was notified on 3/5/2021 application not complete as it was missing environmental documentation (450.47), FSA, Systems Safety, and FSS. SpaceX provided a total of 47 additional submissions to its application through 10/7/2021 when the application was complete and accepted. SpaceX modified the application with 87 additional submissions before a determination was made on 4/14/2023. SpaceX's application was never tolled.
Varda Space, Winnebago	2/28/2022	10/17/2022	04/17/2023	09/06/2023 (Denial) 2/14/2024 (2 nd Application)	2/21/2024	Pre-App to Accepted Application: 413 days Application Accepted to Determination: 142 days for the denial, 58 days for 2 nd application	Varda's MOC review took approximately 10 months, prior to application acceptance. The application was tolled 61 days due to open Environmental and FSA items, and then denied on 9/6/2023 due to major, erroneous FSA and trajectory updates that were submitted too close to the evaluation deadline. Varda subsequently resubmitted on 12/18/2023 and was approved on 2/14/2024.
Stratolaunch, Roc/Talon	1/24/2020	12/17/2021	10/21/2022	12/12/2023	3/9/2024	Pre-App to Accepted Application: 1001 days Application Accepted to Determination: 417 days (including 248 day toll)	Stratolaunch did not provide a complete application until 10/21/2022. Stratolaunch was tolled twice during its evaluation for 248 days, from 2/10/2023 to 10/6/2023 and from 12/1/2023 to 12/11/2023. The tolls were for numerous unresolved application deficiencies including FSA MOC, a violation in the approved MOC for its compatibility with Vandenberg SFB's range transmitters. Stratolaunch received a waiver to 450.115 FSA Methodologies as part of the License determination.
Inversion, Ray	6/22/2022	5/1/2023	09/13/2024	10/10/2024	1/15/2025	Pre-App to Accepted Application: 814 days Application Accepted to Determination: 27	Initial application found incomplete, insufficient FSA MOC. Inversion continued to update its FSA MOC through September 2024. 450.115 FSA Methodologies as part of the license determination.

Blue Origin, New Glenn	4/21/2017	4/9/2021	09/04/2024	1/16/2025	TBD	Pre-App to Accepted Application: 2693 days Application Accepted to Determination: Still in review	Blue Origin initially submitted their application as part of an accepted incremental review per 450.33. Blue Origin did not maintain its approved incremental review schedule, submitting increments of the application out of order and beyond the agreed upon timeframe. Blue Origin submitted its complete application on 1/18/2024. At that time, AST and Blue Origin agreed to cancel the incremental review. Blue Origin's application was formally rejected on Blue Origin's FSA MOC, FSS MOC, and Systems Safety preventing AST from initiating a formal review. Blue Origin submitted a new application on 07/09/24 and continued to make updates through September 2024. Blue Origin's vehicle has not completed necessary developmental testing, and therefore the launch date is unknown at this time.
------------------------	-----------	----------	------------	-----------	-----	--	--

3. Part 450 allows for an incremental approach when reviewing applications. How is FAA using and encouraging use of incremental reviews and determinations as part of the licensing process? Please describe implementation and effectiveness of incremental review. Does FAA plan to further improve on this process to further expedite review of applications?

FAA Response: Under § 450.33, an applicant may choose an incremental review approach. This approach allows an applicant to separate the safety review of its license application into modules or sections so that completed modules or sections can be submitted early to the FAA for evaluation and approval, rather than waiting until the entire application is complete. Based on the limited applications requesting incremental review, the FAA found that the incremental review has not streamlined the licensing process. An applicant must first have its incremental review approach approved by the FAA prior to submitting an application so that the FAA can ensure that a safety review module is submitted in a workable order and can be reviewed by the FAA independently from the rest of the application. The FAA is working to improve and clarify the incremental review process.

4. At the hearing, you indicated that some applicants had chosen to change their application from an application covering multiple missions to instead cover only a single mission.
- a. Of the licenses that have been granted under Part 450, how many are for a single mission and how many are for multiple missions?

FAA Response: As of December 2024, AST has issued seven part 450 licenses. Only one license initially included more than one mission (Inversion for reentry). AST issued six part 450 license modifications (five modifications for SpaceX Starship/SuperHeavy for suborbital activities and one to Varda for reentry), three of which enabled multiple operations (SpaceX Starship/SuperHeavy modification three and four).

- b. How does FAA review of a multi-mission license differ from a single mission license? What impact does that have on review time, if any?

FAA Response: Licensing is an application-driven process. The applicant decides the timing of its submittal and proposes the scope of activities to be authorized. Under part 450, applicants can apply for a single license to authorize their entire program, consisting of a portfolio of multiple mission profiles, vehicle configurations, and sites. Part 450 focuses on the approval of an operator's processes to ensure the operator can accurately demonstrate regulatory compliance without a license modification for each new mission profile, provided that an operator is able to submit application material to the FAA that covers a range of launch parameters for multiple mission profiles. This allows the operator to analyze and submit mission specific information as pre-flight deliverables instead of license modifications.

Several part 450 applicants have submitted applications for multiple missions, but later amended their applications to limit them to single missions. Reasons that applications have been changed to a limited or single mission scope include:

- Short timelines to meet commitments to customers, stakeholders, or shareholders (e.g., submitting a new application for a new vehicle less than 6 months out from a

scheduled launch date)

- Importance of the first flight to company priorities and finances (e.g., new companies with new vehicles)
- Likelihood of failure on the first flight of a new vehicle is relatively high and could necessitate changes to the design or operations that would require modifications to the application
- The company has not completed sufficient long-term planning to gather, develop, or submit the data required to apply for future operations.

In practice, these companies submit specific safety analysis products, rather than sufficient descriptions of the processes to derive those safety analysis products. These applications result in a license with a narrow scope because they contain mission-specific data and assumptions in their flight safety analyses, environmental reviews, and other aspects. For example, the FAA has received applications for part 450 licenses containing a single trajectory, as well as applications for part 450 licenses that contain analyses that are valid for a small range of conditions (e.g., wind conditions applicable to just one month). In these cases, AST has waived some of the methodology requirements for the flight safety analyses based on its own independent analysis that demonstrates that the public safety criteria are met for the conditions anticipated during the single operation.

An application for the portfolio of operations for a vehicle program will require the applicant to fully address anticipated variations in the vehicle and the way it is intended to be operated in each of the application requirements enumerated in the regulation. This includes:

- The methodologies submitted to meet § 450.35. More than one methodology can be submitted and approved for each requirement.
- The environmental review requirements of § 450.47, generally enveloping all anticipated operations and potential impacts.
- The flight hazard analysis requirements of § 450.109.

Aspects that are material to public safety that are not fully addressed in the application, or that the operator decides to change, would require the applicant to request a modification to its license.

In summary, a vehicle operator license under part 450 may authorize an operator to conduct launches within a range of launch parameters involving different launch vehicle configurations. The operator must provide license application material that includes but is not limited to the following:

- A description of the different launch vehicle configurations that it proposes to launch under the vehicle operator license.
- A description of the range of launch parameters including:
 - Range of flight azimuths, trajectories, associated ground tracks and instantaneous impact points, and nominal impact points;
 - Range of intermediate and final orbits of vehicle upper stages for orbital missions;
 - Risk analyses (e.g., expected number of casualties) that envelop the range of proposed launch vehicle configurations and trajectories;

- o Description of payload classes and information that envelops the payload classes such as orbital parameters (parking, transfer, and final orbits) and hazardous materials and the amounts; and
- o A process to make changes to safety analyses that the FAA can review and approve, which can reduce the need to approve mission-by-mission analysis products as these adjust and change due to mission requirements.

In general, it may be challenging for an operator to provide the above if it continues to make changes to vehicle configurations and mission profiles. However, for operators who have mature processes and procedures that govern rapid vehicle development, applications under part 450 could focus more on the change management processes, which has the potential to reduce the number of modifications required when constant change is part of conducting these missions.

- c. Are there challenges associated with reviewing multi-mission licenses?

FAA Response: Please see response 4.b. above.

- d. Once FAA has issued a single mission approval, how does FAA assess similar licenses moving forward?

FAA Response: In accordance with § 450.211, a licensee must apply to the FAA for modification of a license if it proposes to conduct a launch or reentry in a manner not authorized by the license or there is a material change (e.g., significant change to a safety critical system or launch trajectory) that could affect public safety. The FAA's evaluation of an application for a license modification is usually shorter in length than an evaluation for a new license. The evaluation of an application for a license modification focuses on what has changed and may leverage prior evaluations that remain valid. The level of evaluation is commensurate with the magnitude and complexity of the material change.

- e. Does FAA ever recommend an applicant switch the license from a multi-mission license to a single mission license to achieve a faster determination?

FAA Response: No, the FAA encourages applicants to apply for multiple missions so that industry and FAA can realize the benefits of the performance-based part 450 rule, provided that an applicant is able to provide application material that covers multiple missions. The licensee is the one that decides the scope of its license and a majority of the time, to date, the licensee has moved forward on a mission-by-mission path as discussed in response 4.b.

- f. Are ACs or other guidance documents published and available to applicants for all Means of Compliance (MOC) required to be fully approved prior to being deemed "complete enough"?

FAA Response: No. The FAA has published several ACs related to MOC required to be fully approved prior to an application being deemed "complete enough." Completed part 450 ACs can be found here:

<https://www.faa.gov/space/legislationregulationguidance/commercial-space-advisory-circulars-ac/commercial-space>

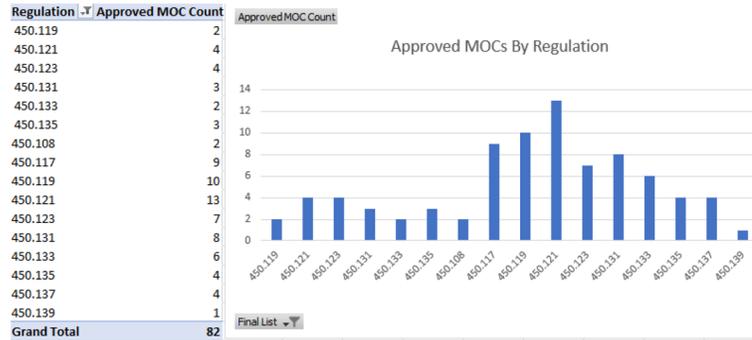
The FAA is working as expeditiously as possible to complete the remaining part 450 advisory circulars (AC). The list of ACs the FAA is currently working can be found here:

<https://www.faa.gov/media/85521>

FAA guidance does not absolve the industry's responsibility for compliance. This includes the industry providing timely, accurate, and responsive application materials that speak directly to the FAA's requirements.

5. When evaluating licensed activities to determine the impact on public safety, FAA relies on probabilistic calculations of risk based on vehicle design, mission profile, and other factors. An applicant is required to use an "accepted means of compliance" for certain requirements. Such means of compliance would have to be accepted by FAA before submission of an application.
 - a. What methodologies has FAA accepted for Part 450 licenses thus far? How does FAA review such methodologies?

FAA Response: The FAA has accepted 82 MOC across the various flight safety analysis (FSA) regulations. Most of these include MOC for trajectory analysis and debris analysis (§ 450.117, §450.119, and § 450.121) because all operators must develop this input data even when they are having a federal entity perform the analysis in accordance with § 450.45(b). The distribution of these approvals is shown below:



The FAA reviews these MOC using an established procedure that involves reviewing the documentation for completeness, followed by a deeper review by a subject matter expert. This expert may be an AST employee or a contractor depending on the required skillset.

- b. If an application demonstrates a mathematically acceptable level of safety, is there another basis on which FAA can reject such application? If so, what is it?

FAA Response: The requirements to obtain a license are articulated in 14 C.F.R. part 450. With respect to safety, an applicant must demonstrate that it can launch a launch vehicle or reenter a reentry vehicle in a manner that meets safety criteria defined in § 450.101. Part 450 subpart C includes application requirements that together demonstrate the applicant can launch or reenter in compliance with § 450.101. Some requirements are indeed quantitative, but others are qualitative in nature.

An applicant may apply to the FAA to waive a requirement or seek to apply a different approach that meets an equivalent level of safety.

- c. Does FAA require or recommend use of a specific software for these safety methodologies?

FAA Response: The FAA does not require any prescriptive methods of complying with § 450.35 MOC. The FAA is currently evaluating an application from a software provider for a safety element approval that, if accepted, could be used as an MOC to the flight safety analyses requirements in 14 C.F.R. § 450.35(a)(1).

- d. Does FAA share types of methodologies that are considered successful means of compliance? How does FAA protect applicant proprietary data?

FAA Response: Unique MOC proposed by applicants may contain proprietary information, which the FAA does not share publicly. The FAA encourages industry to share lessons learned and best practices with one another.

6. It is my understanding that MOCs for Part 450.119 and 450.131 are required to be approved by the FAA prior to accepting an application and starting the 180-day clock. Is this correct?

FAA Response: Per § 450.35(a), the MOC for § 450.115(b)(1) Flight Safety Analysis Methods must be accepted prior to application acceptance. Forms of an acceptable MOC include an applicant-developed methodology, compliance with an AC or Federal entity services under § 450.45(b), or compliance with a safety element that has been approved. Further detail regarding § 450.115 can be found in the recently published AC 450.115-2, Describing Flight Safety Analysis Methods.

- a. Are ACs or any other guidance for these MOC documents published and available to applicants?

FAA Response: The following published ACs assist applicants in preparing an acceptable MOC:

- AC 413.13 Guidance on Submitting a Complete Enough and Complete Application for a Vehicle Operator License
- AC 450.115-1B High Fidelity Flight Safety Analysis
- AC 450.115-2 Describing Flight Safety Analysis Methods
- AC 450.108-1 Flight Abort Rule Development
- AC 450.117-1 Trajectory Analysis for Normal Flight

- AC 450.123-1 Population Exposure Analysis
- AC 450.137-1 De Minimis Far Field Overpressure Blast Effects Analysis
- AC 450.139-1 Toxic Hazards

Further, the following Federal Entity Services may be used as an acceptable MOC in accordance with § 450.45(b) and can be found on the FAA website:

- [United States Space Force \(USSF\) Space Launch Delta 30 \(SLD 30\)](#)
- [United States Space Force \(USSF\) Space Launch Delta 45 \(SLD 45\)](#)
- [National Aeronautics and Space Administration \(NASA\) Goddard Space Flight Center/Wallops Flight Facility \(GSFC/WFF\)](#)

Additional guidance regarding FSA is posted on the FAA’s website and includes the following:

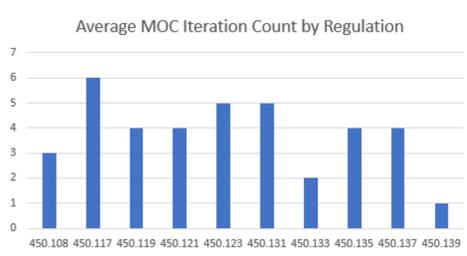
- [Guide to Probability of Failure Analysis for New Expendable Launch Vehicles](#)
- [Guide to Reusable Launch and Reentry Vehicle Reliability Analysis](#)
- [Guidance Statement on Hazardous Scenarios](#)
- [Guidance Statement on Flight Safety Analysis Methodology Descriptions](#)
- [Treatment of Uncertainty in Flight Safety Analysis](#)
- [Stage Survivability After Launch Abort](#)

b. If not, does FAA anticipate publishing MOCs for these regulations and if so, on what timeline?

FAA Response: An AC for § 450.119 is being drafted with a planned publication date in FY26. An AC for § 450.131 is also being drafted and the FAA plans to publish this AC by the end of FY25.

7. On average, how many iterations of a MOC does an applicant submit before AST considers such MOC “complete enough”?

FAA Response: No iterations are required if the application material sufficiently addresses the regulation. However, on average, it has taken operators approximately four applicant submissions for a given MOC to be found acceptable. The graph below shows the average number of MOC iterations by regulation.



- a. How does AST ensure that guidance from multiple AST reviewers is consistent and does not conflict between iterations?

FAA Response: Where possible, AST leverages the same subject matter experts for each regulation across multiple iterations. AST leverages internal checklists, tracking systems, and reviews to ensure that all evaluators are using the same criteria and have access to the full history of the MOC document.

- b. What processes are in place to ensure the level of rigor in assessment of these MOC documents is consistent across AST?

FAA Response: While AST ensures consistent application of the regulations in considering MOCs, some MOCs may require a less complex analysis due to the level of risk associated with the overall operation. AST considers the overall risk of the proposed operation when assessing MOCs. For some operations, such as operations over open ocean or launches from geographically remote areas, a lower level of fidelity can be applied to demonstrate public safety. AST tactically assigns resources to based on the necessary level of fidelity to determine whether a MOC satisfies the applicable regulation.

- c. What is being done to make this process more transparent, consistent, and efficient?

FAA Response: AST is working to utilize advanced tools to adapt to the changing landscape. AST is developing a Licensing Electronic Application Portal (LEAP), which will be used to accept, modify, exchange, and approve licensing materials under part 450. We are working to provide a minimum viable product by the end of FY25.

Questions submitted by Ranking Member Eric Sorensen

1. Your written statement and several of the other panelists' statements mention a license electronic application portal that is intended to facilitate transparency with and tracking of license application status. What is the status of this tool and when does the Federal Aviation Administration (FAA) plan to introduce it?

FAA Response: AST is working to utilize advanced tools to adapt to the changing landscape. AST is developing a Licensing Electronic Application Portal (LEAP), which will be used to accept, modify, exchange, and approve licensing materials under part 450. We are working to provide a minimum viable product by the end of FY25 that applicants can use and work with us on product improvements.

- a. Mr. Cavossa's written testimony advocates for using a commercially available tool rather than waiting for an FAA-developed portal. What are your thoughts on this approach?

FAA Response: Commercially available tools can be useful, but the FAA is also required to comply with federal information technology requirements. LEAP will align with Federal requirements to ensure that the operator's proprietary information is protected by:

- Complying with U.S. Government IT security requirements for internal systems to prevent malicious actors from accessing the system and FAA's data
 - Limiting access to information systems to authorized users
 - Controlling information posted on publicly accessible systems
 - Authenticating users before allowing access to systems
 - Sanitizing or destroying information system media before disposal
 - Limiting physical access to systems and equipment
2. Does FAA need, in your view, additional hiring authorities, or policy actions by Congress that would help with acquiring the necessary number of staff as well as the requisite areas of skills and expertise to help process launch and reentry licenses and provide necessary industry guidance?

FAA Response: The FAA's stellar safety record is a testament to its staff's dedication and expertise. Over the past decade, FAA-licensed commercial operations, including launches and reentries, has grown by over 900 percent, from 14 in FY15 to a new record of 148 in FY24. Thanks to congressional support, AST has been able to increase its staff by 40 percent over the last two years. This growth has allowed AST to better meet the growing demands of the space industry. AST has used the FAA's direct hiring authority to increase the pace of acquiring engineering staff. The President's FY25 budget proposal includes additional funding to further expand AST's staff, ensuring it can continue its safety evaluations and inspections.

3. How many new positions was your Office funded to hire in FY23 and FY24, and how many of those new Full-Time Equivalent staff (FTEs) have been hired to focus exclusively on launch and reentry licensing?

FAA Response: AST filled 36 new positions in FY23 and FY24; 25 of those positions were placed under the Office of Operational Safety, which is responsible for licensing launches and reentries.

- a. What number of existing staff, within the FAA Office of Commercial Space Transportation's more than 150 staff, are devoted to launch and reentry licensing?

FAA Response: As of November 5, 2024, 101 staff members are in the Office of Operational Safety and 55 staff members are in the Office of Strategic Management which supports licensing with budgeting, finance, contracts, human resources, rulemaking, ACs, standards, policies, training, tools, and research.

4. Some commercial launch and reentry operators are carrying out activities under the legacy FAA regulations and will need to transition those existing licenses to the Part 450 regulations. Other providers are seeking licenses under the new Part 450 regulations.

- a. How many licenses have you approved under Part 450?

FAA Response: As of December 2024, AST has approved seven licenses under part 450.

- b. How many Part 450 licenses are in process now, and for how many of those have you

started the 180-day statutorily required clock?

FAA Response: As of December 2024, AST has two part 450 applications that are being screened to determine if the applications are complete enough to accept, and AST has one accepted part 450 application (Blue Origin New Glenn) that is under evaluation by the AST licensing team.

- c. How many existing, legacy operator licenses do you anticipate having to transition to Part 450 over the next 2 years?

FAA Response: We anticipate approximately 10 operator licenses will have to transition over the next two years.

5. Several witnesses at the hearing discussed the role of advisory circulars in guiding license applicants on providing acceptable information and analyses for the new Part 450 regulations. Some witnesses also discussed that FAA is behind in issuing these advisory circulars. What would help enable the issuance of advisory circulars? Is this an area for which dedicated staffing is needed?

FAA Response: AST issued 17 ACs in FY23, and ten ACs in FY24. These are technically complex documents that require dedicated technical experts and resources. AST is prioritizing the ACs according to industry and operational needs. We are continuously evaluating our allocation of resources within the office to best meet industry needs with the personnel we have on hand.

6. Mr. Cavossa brought up in his written testimony that launch and reentry operations at or near federal launch ranges owned by the Department of Defense or the National Aeronautics and Space Administration can sometimes require safety and risk analyses conducted for those federal agencies that either conflict with or duplicate what the FAA is requiring the commercial provider to do for their licenses. How is FAA working to address this issue, particularly when the analyses conflict?

FAA Response: Section 450.179(b) permits an applicant to leverage a federal launch or reentry site's ground safety processes and procedures to meet the FAA's requirements. This flexibility avoids levying duplicative requirements on operators. The FAA recently issued Notices of Determination that state that various flight safety analyses performed by the Federal ranges in California, Florida, and Virginia, satisfy requirements of the part 450 launch and reentry licensing rule. Additionally, the FAA issued a Notice of Determination that determined the NASA Kennedy Space Center (KSC) ground safety processes, requirements, and oversight satisfy the part 450 launch and reentry licensing rule. In particular, this ground safety-related notice of determination (<https://www.faa.gov/media/6566>) clarifies the conditions under which the FAA will relieve commercial space operators from having to demonstrate compliance with FAA ground safety requirements when conducting licensed activities at KSC, provided the operator has a written agreement with the KSC.

The FAA aims to minimize the burden on ranges and operators while ensuring compliance with our statutory obligations. Also, we are working on updating our memorandum of understanding with NASA to include a HQ level agreement as well as agreements with the Wallops Flight Facility and Kennedy Space Center.

We encourage operators to utilize U.S. Space Force and NASA safety analyses when these analyses employ methods and assumptions consistent with FAA regulations and guidance, and when the operator can clearly demonstrate how the content of the analyses ensures compliance with FAA regulations. In many cases, NASA analyses are produced specifically for mission assurance or NASA personnel, astronaut, and facility safety and not primarily for public safety. In those instances, it may not be appropriate for an operator to utilize those analyses in full to meet FAA regulations.

We do allow operators to have federal ranges perform analysis; however, it is a company's discretion whether they want to leverage the federal range services or conduct their own safety analysis.

7. There are unique considerations regarding space launch and reentries such as the fact that most emissions from launch and reentry are of both gas and particles that go into the middle and upper layers of the Earth's atmosphere. Is that something FAA is tracking as other agencies, such as the National Oceanic and Atmospheric Administration (NOAA), begin to look at the issues?

FAA Response: Air quality is assessed as a component of the environmental review process for every major federal action, including the issuance of a commercial space launch site or vehicle operator license. However, the focus of the air quality assessment is limited to the boundaries of the United States and emissions below 3,000 feet. Emissions of space transportation vehicles are uniquely poised to eject both gas and particles directly into the upper atmosphere. These emissions are of national interest but are not currently applicable to public safety or the foreign policy interests of the United States. Therefore, FAA is limited in its ability to track, assess, or evaluate emissions into the upper atmosphere. FAA works to ensure compliance with emissions standards set forth in special purpose environmental laws. We are aware of continuing interest in developing research to evaluate the potential impacts of space vehicle emissions in the upper atmosphere.

8. The Government Accountability Office (GAO) recently reviewed FAA's commercial space mishap investigation process and found that, for all 49 mishap investigations between 2000 and the beginning of 2023, the FAA chose to authorize the commercial space operator to investigate its own mishap and identify root cause and corrective actions. GAO's review found that FAA does not have formal criteria for making the decision on who should conduct the mishap investigations, FAA or the commercial space operator. GAO recommended that FAA develop such criteria, and FAA concurred. Has FAA developed those criteria? If not, what is the date that the criteria are expected to be released?

FAA Response: In response to the GAO recommendation for the development of criteria, the FAA requested the closure of this recommendation based on the following rationale. Pursuant to FAA regulations, the agency authorizes all licensed vehicle and site operators to lead mishap investigations for incidents occurring within the scope of their license. This approach is outlined in license application material supplied by operators showing compliance with Title 14 of the Code of Federal Regulations §§ 415.41, 417.111(h), 420.59(a), 431.45(d), 437.41, and 450.173(a). These regulations require vehicle and site operators to document how they intend to investigate mishaps that occur within the scope of their license. The FAA also provides guidance to operators in FAA AC 450.173-1 "Mishap Plan – Reporting, Response, and Investigation Requirements," published August 12, 2021. The FAA determined that this approach is the best use of government resources,

leads to promoting safety due to no recurrence of failures, and allows the industry to innovate at its own pace.

9. Your Office established an Aerospace Rulemaking Committee (SpARC) in April 2023 to gather industry input on potential future human occupant safety regulations. FAA had anticipated a release of a report from the SpARC this summer. What is the status of the SpARC, and when can the Science Committee expect to see a report?

FAA Response: The Part 460 Human Spaceflight SpARC is finalizing its report and AST expects to publish it in early 2025.

Questions submitted by Full Committee Ranking Member Zoe Lofgren

1. What level of resources would enable the FAA Office of Commercial Space Transportation to fully meet the demands, including staffing needs, associated with the increasing pace of commercial launch and reentry activities, among its other statutory responsibilities?

FAA Response: The FAA's impressive safety record and ability to meet the needs of this rapidly growing industry are in large part because of the incredible staff that we have in AST. FAA-licensed commercial operations have grown in the last decade by over 900% while the increase in our staff size and resources have remained comparatively flat.

Though, thanks to recent support from Congress, utilizing various hiring and recruiting authorities, we have been able to increase our team to 166 (as of November 7, 2024) staff members, which allows us to address some of the growing demands that have been placed on our office. The President's FY25 Budget Request continues this support by providing funding for the agency to hire additional staff to conduct authorization evaluations, safety analyses, and safety inspections.

2. To what extent does the FAA leverage external expertise, either from other federal agencies such as the National Aeronautics and Space Administration (NASA) and the Department of Defense (DOD) or from Federally Funded Research and Development Centers (FFRDCs, for technical expertise and analysis to support FAA's commercial space launch and reentry licensing activities? Are there particular barriers to doing so?

FAA Response: The FAA works closely with NASA and DOD. NASA, DOD, and FAA are members of the Common Standards Working Group which enables the organizations to work closely together on launch and reentry safety issues and standards. The FAA also works closely with each federal launch range individually when it hosts a commercial launch or reentry applicant or licensee.

The FAA has contracts with two FFRDCs that provide additional expertise for licensing - MITRE and Aerospace Corporation.

3. To what extent can the development of voluntary industry consensus standards contribute to establishing means of compliance for FAA's launch and reentry regulations?

FAA Response: The FAA has a long history of working with industry to develop voluntary consensus standards leading to eventual FAA adoption of the standards as an MOC to certain requirements. The FAA is confident that our work with the American Society for

Testing and Materials (ASTM International) and other standards organizations will yield useful standards to be used as eventual MOC.

- a. Has the FAA assessed the completeness of standards to serve as means of compliance, as recommended by the Commercial Space Transportation Advisory Committee (COMSTAC)?

FAA Response: The FAA works with ASTM F47, which focuses on the standard guide for space system safety, and other standards organizations to develop voluntary consensus standards and will consider conducting a survey when more standards are published.

- b. How is FAA working with standards organizations on such matters?

FAA Response: The FAA is a member of the ASTM F47 Executive Committee to strategically align standards development activity across the commercial space transportation industry. The FAA has staff supporting the 9 subcommittees under ASTM F47 standards development activities.

Questions submitted by Rep. Mike Garcia

1. How many employees is FAA requesting in their FY25 budget request for the purpose of processing license applications at AST? Is this enough to handle the expected influx of Part 450 applications in FY25 ahead of the March 2026 deadline?

FAA Response: If AST is authorized in accordance with the FY25 President Budget request, AST could hire up to about 54 new employees – 41 of the 54 new positions would be allocated to the Office of Operational Safety.

2. Is Administrator Whitaker aware of the delays with part 450 licensing at AST?

FAA Response: Of the seven part 450 licenses FAA authorized, two were over the 180-day statutory review period. Administrator Whitaker is aware of these two occasions.

3. Are there program management reviews underway at FAA, above the AST level, to identify solutions to streamline part 450 license reviews in your office?

FAA Response: We are continuously seeking ways to improve the licensing process within AST. The Secretary signed the “Part 450 SpARC” charter on November 7, 2024, and the first meeting of the SpARC was held December 5, 2024.

4. Inclusive of the full pre-application period for each new license, how long did it take AST to complete each of the six approved applications under Part 450? Of those timelines, how much time was allocated to the pre-allocation process?

FAA Response: See table below for the number of days (minus the days that an application was tolled) to conduct the evaluation to make a license determination that led to the issuance of a license under part 450. For the estimated pre-application consultation timelines, see the FAA response to question #2.a.8 from Chairman Brian Babin.

Applicant, Vehicle	Evaluation Days to Make License Determination
Astra, Rocket 3.3	99
ABL, RS1	145
Relativity, Terran-1	280
SpaceX, Starship-Super Heavy	554
Varda Space, Winnebago	58
Stratolaunch, Roc/Talon	169
Inversion, Ray	27

Questions Submitted by Rep. Kevin Mullin

1. From human spaceflight to space data to spaceports, how does the FAA support NASA’s Commercial Crew Program and the future commercialization of space?

FAA Response: The FAA supports NASA’s Commercial Crew Program by licensing both commercial crew and commercial cargo missions to the ISS. NASA contracts for crew and cargo deliveries to and from space. The FAA licenses the launch to space and the reentry from space within our statutory authorities to protect the public, property, national security, and foreign policy interests of the United States. We will continue authorizing launch and reentry activities as NASA relies on commercial launch and reentry services to support its future plans in Earth orbit and beyond.

2. For commercial launches, to what extent does the FAA coordinate with the National Park Service and the Fish and Wildlife Service in protecting public lands and wildlife habitats near launch sites? How do the agencies coordinate, if at all?

FAA Response: The FAA coordinates with the National Park Service (NPS), US Fish and Wildlife Service (USFWS), and all applicable Federal Agencies in compliance with the National Environmental Policy Act (NEPA). NPS and USFWS often participate as cooperating agencies on FAA’s environmental documents.

AST coordinates directly with USFWS in compliance with Section 7 of the Endangered Species Act to ensure all proposed actions are not likely to jeopardize threatened or endangered species, or adversely modify designated critical habitat for listed species. AST coordinates directly with NPS in compliance with Section 4(f) of the U.S. Department of Transportation Act of 1966.

3. How does the FAA ensure environmental and community impacts are minimized when it approves launches? How is the agency working to mitigate any harms, even as launch plans change over time?

FAA Response: Neither the Commercial Space Launch Act (CSLA) nor NEPA compel a particular environmental outcome nor require that environmental or community impacts be minimized in approving launch license applications. Rather, each provides guidance to the FAA in reaching decisions related to the issuance, modification, and renewal of a vehicle or site operator license. The CSLA’s primary focus is safety; it considers public health and welfare and focuses on

whether license applicants meet federal environmental laws in carrying out licensed activities. NEPA, on the other hand, imposes procedural requirements to ensure the FAA considers the environmental impacts of its decisions.

Per NEPA, AST analyzes a commercial space operator's proposed activities for potential environmental impacts and discloses that analysis in an Environmental Assessment or Environmental Impact Statement. To the extent that a special purpose law requires, or an applicant seeks to mitigate the impacts of its proposed launch, FAA will analyze the proposed mitigation measures, require the applicant to commit to carry them out, and monitor compliance.

AST's Stakeholder Engagement Program promotes public engagement beyond what is required by NEPA, reaching out to the surrounding communities and relevant stakeholders regularly on a variety of forums including the internet, local newspapers, email distribution, and public meetings to ensure that interested stakeholders are aware of the proposed action, its environmental impacts, and proposed licensing schedule. AST encourages all interested stakeholders to partake in the public comment period and review process.

When an applicant proposes to modify an action that was previously analyzed in a NEPA document, AST develops a Written Re-evaluation to confirm that the previous analysis remains substantially valid.

Questions submitted by Rep. Darrel Issa

1. In 1903, the Wright Brothers flew the first aircraft. The flight lasted just 12 seconds and traveled only 180 feet, but it proved that human spaceflight was possible. There were no licenses or flight plan approvals – and this practice would continue for a considerable amount of time, as the FAA was not established until 1958. Therefore, early innovators had the freedom to experiment with this new technology, push boundaries, and make mistakes without the weight of government regulation. This creative leeway allowed them to test their ideas, refine their designs, and ultimately revolutionize transportation. And, at the onset of regulation, government worked with the budding aviation industry to do this. Today, we see a parallel opportunity for the commercial space industry – that is being hindered by government. Instead of fostering this spirit of innovation, the current regulatory landscape presents unnecessary hurdles for commercial space companies. It is inconceivable to me that it takes less time to develop a new rocket than it takes your agency to complete paperwork. I understand a part of the licensing delay is that the rules are difficult to comply with. Four years after you released the Part 450 rule, you have published fewer than half of the Advisory Circular guidance documents your own regulations say are necessary. Even with an increased budget, these documents have not been completed.

- a. Has the lack of guidance elongated the licensing process?

FAA Response: Lack of regulatory guidance does not absolve the industry's responsibility for compliance. This includes the industry providing timely, accurate, and responsive application materials that speak directly to our requirements. However, the FAA provides the industry with additional sources of guidance, including pre-application consultation, topic-based workshops, and bi-weekly question-and-answer sessions known as "office hours." Regulatory clarity continues to be a priority for us.

- b. Will you commit to completing the guidance process in a timely manner?

FAA Response: Guidance material development draws upon our licensing evaluation resources. We continue to manage workload and priorities and commit to completing all guidance material in a timely manner.

- c. When will you have the remainder of these guidance documents completed?

FAA Response: AST plans to publish 4 new ACs by the end of FY25 and an additional 6 new ACs by the end of FY26.

2. While the FAA continues to hold up Starship's launch, China is launching Long March rockets. FAA has 180 days by law to complete licensing for an application. It regularly fails to meet that deadline. For example, it took your office nearly two years to complete licensing reviews for the first test flight of the Starship rocket that will land NASA astronauts on the Moon. The missed deadline delayed America's lunar program. While American space companies face these challenges, China is advancing steadily. Do you acknowledge that licensing delays are pushing the Artemis Program's timeline further and further off track?

FAA Response: AST does not believe launch licensing has delayed the Artemis program.

Questions submitted by Rep. Dale Strong

1. Mr. Coleman stated at the hearing that 65-70 percent of AST personnel are engaged in license application review.

- a. What functions do the remaining 30-35 percent of AST personnel perform?

FAA Response: AST Office of Strategic Management functions with the remaining 30-35 percent of AST personnel. This office is responsible for developing regulations and guidance, conducting and managing research activities, managing stakeholder outreach, operating the Office of Spaceports, and conducting management services, which includes human and financial resources management, and team training.

- b. Why are these functions higher priority than license evaluations?

FAA Response: We do not consider these functions a higher priority than license evaluations. These supporting functions are necessary for the successful execution of AST's Operational Safety Directorate.

- c. For any work not pertaining to licensing or administrative functions, what statutory authority does AST rely upon to justify such work?

FAA Response: The Office of Spaceports' statutory authority comes from title 51 of the United States Code, chapter 515: Office of Spaceports. U.S. spaceports have a critical role in the growing global commercial space transportation industry. The Office of Spaceports was established by the FAA Reauthorization Act of 2018 to be a centralized policy office within the FAA Office of Commercial Space Transportation. The Office of Spaceports is responsible for supporting licensing activities for operation of launch and reentry sites, developing policies that promote infrastructure improvements at spaceports providing

technical assistance and guidance to spaceports, promoting United States spaceports within the Department of Transportation, and strengthening the nation's competitiveness in commercial space transportation infrastructure and increase resilience for the Federal Government and commercial customers.

AST's work pertaining to space transportation infrastructure matching grants derives its statutory authority from title 51 of the United States Code, chapter 511: Space Transportation Infrastructure Matching Grants. This statute provides that, to ensure the resiliency of the space transportation infrastructure of the United States, the Secretary of Transportation may make project grants to sponsors.

2. Is there a memorandum of understanding (MOU) or other form of agreement in work between NASA and the FAA regarding FAA licensed launch and reentry activities from/to NASA property or when NASA is providing analysis support for an applicant to comply with FAA license application regulations?

FAA Response: AST is actively working on an Inter-Agency Agreement (IAA) regarding FAA-licensed launch and reentry activities from/to NASA property.

- a. What is holding up this agreement from being agreed to and signed?

FAA Response: We are actively working with NASA to close out this IAA by early 2025.

- b. Are applicants being asked to support duplicative work while this agreement remains pending?

FAA Response: No, the FAA works separately with the operators and the Federal sites on a case-by-case basis to ensure there is no duplication of regulatory oversight. The purpose of this agreement is to clarify the authorities, responsibilities, and roles of both organizations, and eliminate any duplicative requirements.

Questions submitted by Rep. Rich McCormick

1. Despite your description of operations in your testimony, a significant reason your office is experiencing licensing delays is not insufficient funding or broken regulations, but a lack of internal focus and structure. For example, you have no policy dictating what is required to complete a license, so your analysts don't know what information to review. Do you understand that each layer of inefficiency at the FAA and on your team directly adds to schedule delays for critical national missions? Do you commit to undertaking a thorough internal review to improve internal lines of communication and improve your office's efficiency in processing licensing?

FAA Response: FAA's regulations under part 450 specifically outline what is required to complete a license. We are committed to improving internal lines of communication and efficiency.

2. Environmental reviews seem to be a significant part of delays, given the timelines afforded to other agencies, who often take the maximum time or longer, even on small items of review.

What has your office done to improve coordination with other agencies and take a leadership role in negotiating agency consultations?

FAA Response: Our office works closely with all interagency partners. AST holds regular meetings with our federal partners, during which we discuss both ongoing and upcoming efforts requiring coordination. Through these working sessions, AST is able to respond to the agencies' data needs to expedite the review process. Through this active coordination, the agencies are often able to reduce the regulatory timeframe for reviews. In addition, our office has also developed, and is further developing, new programmatic consultations and agreements with our federal partners. For example, we have a standing agreement with United States Space Force and have developed a programmatic consultation with National Marine Fisheries Service.

3. Why has The Office of Commercial Space Transportation (AST) not issued any Categorical Exclusions for the launch sector, which are common on the aviation side of the FAA?

FAA Response: FAA AST does not currently have any Categorical Exclusions (CATEX) for the launch sector. May 1, 2024, regulations issued by the Council on Environmental Quality set forth a new process through which agencies may establish categorical exclusions through a programmatic environmental document.

4. What steps is The Office of Commercial Space Transportation (AST) taking to promote the expansion of launch infrastructure development, to streamline the regulatory process, and help establish new launch capability, which is so critical for our country's commercial space industry to be competitive?

FAA Response: U.S. spaceport infrastructure has a critical role in the growing global commercial space transportation industry. The Office of Spaceports was established by the [2018 FAA Reauthorization Act](#) to be a centralized policy office within the FAA Office of Commercial Space Transportation. The FAA Office of Spaceports is responsible for the development of policies that promote infrastructure improvements and strengthen the competitiveness of US spaceports, supporting launch and reentry site licensing activities, providing technical assistance and guidance to existing and proposed new spaceports, and the domestic and global promotion of US spaceports.

The Office of Spaceports strategic goals are to:

1. Strengthen the competitiveness of U.S. commercial space transportation infrastructure and launch services encouraging innovation and strategic partnerships for spaceport future planning and development.
2. Modernize the regulation of U.S. launch and reentry sites to promote increased public safety for the growing commercial space transportation industry.
3. Collaborate with countries developing launch or reentry sites to promulgate U.S. commercial space transportation regulations and best practices for safety during launch and reentry activities to support the U.S. as a global leader in the commercial space transportation industry.

To this end, the FAA is leading a federal government National Spaceport Intergovernmental Working Group to develop a National Spaceport Strategy to leverage the full network of domestic spaceports to the benefit of the space transportation industry and the nation as a whole. The

strategy will consist of three primary areas of interest: promote innovation and investment in spaceport infrastructure; establish consistency in operations and standards at the nation's spaceports; and promote cooperation and partnerships between federal and commercial spaceports. Other members of this group include the Department of Defense, the Department of State, the Department of Commerce, the U.S. Space Force and NASA.

AST has also made significant efforts to improve its internal efficiency to address concerns about the time it takes to process license applications. Over the past 11 years, AST has issued 49 licenses, averaging 151 days per license. AST is constantly working to bolster staffing, improve communication with industry, and invest in new tools to streamline the process (as mentioned above). Last year, the MITRE Corporation was tasked with helping AST implement additional Safety Management System principles, which will further modernize the licensing process. This 21st-century licensing process will enable risk-based safety decisions to be made at the lowest possible level, thereby streamlining the process. The FAA also has opportunities to apply outside expertise to unique or innovative licensing challenges. This includes the services of two federally funded research and development centers with access to a broad network of experts in other agencies, industry, and academia, as well as multiple contractors.

Questions Submitted by Rep. Brandon Williams

1. The FAA is experiencing unacceptable delays in issuing launch and reentry licenses. Part 450 regulations are broken and your office has overseen this highly inefficient licensing process. Not only are timelines for licensing way too long, they are also highly unpredictable. This has made it harder for commercial space companies to operate and carry out their missions.

In your testimony, you have said this is because your office doesn't have enough resources. Yet, you have simultaneously directed your staff to focus on new areas of regulatory authority completely unrelated to public safety, like mission authorization, orbital debris, and human spaceflight. For example, in September 2023, FAA-AST proposed a rule on the "Mitigation Methods for Launch Vehicle Upper Stages on the Creation of Orbital Debris", which would expand FAA regulations over in-orbit operations.

As you are well aware, Congress has not given your office these authorities. In fact, the Science Committee recently passed in markup the Commercial Space Act, which grants authority over many key in-space operations to the Department of Commerce, rather than AST.

- a. Don't you think it is unreasonable to ask for more work when you can't get your existing work done on time? Why is AST trying to expand its authority to other domains of space policy when it has not been able to carry out its basic duty to license launches efficiently?

FAA Response: Since 1989, this office has licensed or permitted over 860 commercial space operations without harming the public or property. We have undertaken significant efforts to update our regulations and processes to create more capacity. The Department of Transportation's statutory authorities establish the goal of ensuring the U.S. continues to be the global leader in space by leading safely. We continue leveraging our licensing priorities while pushing to advance and update the regulatory environment, capabilities, and other programs and initiatives, to enable the success of the U.S. commercial space transportation industry and ensure the U.S. remains the preeminent commercial space leader. To retain U.S. leadership, the

regulatory regime must grow with the expanding space transportation industry.

- b. Until your office can consistently meet licensing deadlines, it is clear that AST must direct every employee to focus on completing its licensing goals. Will you commit to end your focus on distracting issues beyond AST's role and refocus your workforce?

FAA Response: We are committed to regulatory clarity so that operators know what it takes to fly safely and protect the public from harm. We want to be sure that our regulations are understandable, actionable, and achievable and AST will continue to enable safe space transportation.

- c. In your written testimony, you seem to not even acknowledge that there is even a problem with timelines for Part 450 licensing. You suggest that AST averages 151 days to issue a new license, but this fails to account for the lengthy "pre-application" review period. Do you take any personal responsibility for the incredibly delayed licensing process at AST? How can you address this problem when you are struggling to acknowledge that it exists?

FAA Response: My team takes incredible strides, over and beyond, to work with the many companies, most of them first time applicants, to understand how compliance with our requirements are met. First, the burden of regulatory compliance is on the applicant, not the FAA. As a matter of policy, the FAA does not accept an incomplete application because that would be a lose-lose scenario for industry and FAA, ultimately ending in an application denial. In our 40-year history, we have only issued one denial. This is because FAA works diligently up front with the applicant to set the applicant up for success. The regulations require that the FAA accept an application only when it is complete enough for the agency to begin its review. This is because accepting an applicant's initial application submissions without screening the application for quality would lead to more application denials and more frustration within FAA and industry due to loss of time and resources.

- d. SpaceX's Starship program, for example, is currently experiencing timeline delays of 5 months and more launch licensing. Don't you think that the licensing inefficiencies at your office will weaken the United States' presence in space and open the door for our adversaries, especially China, to out-compete us on space development?

FAA Response: Staying ahead in space development requires continuous improvement and strategic planning, especially in the face of growing competition internationally. The FAA is fully committed to collaborating with government and industry partners to streamline our efforts and boost our competitive edge. Together with our partners, we will continue to enhance our regulatory processes, operational efficiencies, and technological advancements to ensure the U.S. remains a leader in space exploration.

Questions submitted by Rep. Vince Fong

1. NASA has set an ambitious timeline for a lunar landing by 2026, tasking SpaceX's Starship for this mission. With international competition intensifying, where China achieved a record 63 launches in 2023, a sufficient launch cadence is necessary for NASA and SpaceX to develop the technical maturity needed to meet the U.S. goals and support critical science and national security priorities. What was FAA's intended target for the number of licensed launches for

SpaceX's Starship vehicle in 2024? Do you believe the current cadence, as allowed by FAA, puts the U.S. on track to meet its goals, including NASA's timeline to achieve a lunar landing by 2026 and, more broadly, to remain competitive with China's rising launch cadence?

FAA Response: The FAA does not set targets for the numbers or dates of commercial launches. We respond to what we receive from the companies in the applications they submit. In January 2024, SpaceX proposed a series of five modifications to its license for Starship that could support as many as 11 flights in 2024. In February 2024, FAA provided SpaceX a list of recommendations which would allow the FAA to make quicker determinations in accordance with SpaceX plans.

Those recommendations included:

- SpaceX not waiting to submit application material, but providing it in time to meet predetermined deadlines.
- SpaceX submitting high quality application materials that do not require several iterations to obtain FAA acceptance.
- SpaceX not changing application material once it was formally submitted.

Almost immediately, SpaceX began deviating from these recommendations, focusing specifically on changes they were making to the next flight and the need to "just get this next flight off". This approach became even more challenging when they decided to accelerate their plans to conduct the RTLS operation on short notice. At the time, the FAA had just approved an unlimited number of launches using the same profile and configuration used for flight 4.

The FAA communicated to SpaceX that it can support the proposed 25 launches from Boca Chica in 2025 if SpaceX can consolidate its modification requests into a minimal number, submit high quality information to the FAA as soon as it is available, and minimize changes to submitted material, but notifying the FAA of unavoidable changes as soon as they are made. SpaceX responded by proposing three modifications, the first of which the FAA has received and has started evaluating.

2. Enhancing U.S. capabilities in space is dependent on the ability to launch more and more unique vehicles and payloads. Licensing stagnation could limit launch cadence and impact the willingness of commercial industry to take on new technical challenges. What factors and weighting do AST use to prioritize work to ensure that all launch providers may launch when their vehicles are ready?

FAA Response: The FAA applies the highest priority to its work to evaluate applications supporting national priorities. This includes operations conducted in support of NASA and the DOD. Further, the FAA takes great strides to ensure that it makes determinations on operator requests for modification, waiver, or renewal of their licenses so as not to delay planned operations. When approaching new applications, the FAA considers a number of factors, including the readiness of the company to execute the application process, most often demonstrated by the quality and completeness of their applications, the applicant's response time to the FAA's feedback on their application materials, and the amount of time that the company has been waiting on the FAA for a response.

3. What team within AST is accountable for driving forward progress on submitted license applications?

FAA Response: The Office of Operational Safety is the accountable team.

4. What are you doing to ensure that AST feels empowered to be proactive and decisive when faced with novel safety methods or system designs? If an individual analyst is uncertain of how to proceed or if an applicant disputes a finding, what avenues does either party have to request assistance in an evaluation?

FAA Response: Congress has funded the FAA to conduct research on anticipated novel safety methods and system designs in commercial space transportation. Currently, the FAA is conducting research to improve estimates of the explosive potential of new propellant combinations, the increasing autonomy in safety systems, the vulnerability of ships and aircraft to debris, and other topics. The results of this research will be used to update FAA standard operating procedures for evaluation, improve applicant guidance, and inform future rulemakings. The FAA also has opportunities to apply outside expertise to unique or innovative licensing challenges. This includes the services of two Federally Funded Research and Development Centers with access to a broad network of experts in other agencies, industry, and academia, as well as multiple contractors.

With regard to decision making, the FAA tasked the MITRE Corp last year to identify and assist in implementing additional safety management system principles in its licensing process. This task has produced a prototype set of risk-based decision tools that the FAA is currently working to institutionalize as updates to its standard operating procedures.

When an applicant disputes a finding, they have the opportunity to present additional data and information to the FAA to support its reconsideration. This can happen during pre-application consultation, as part of the collaborative period of dialogue that takes place prior to the FAA accepting an application. After application acceptance, an applicant can seek an appeal of the FAA's determination using the process outlined in § 413.21. At any time, an operator may present a request for waiver to the FAA using the process outlined in § 404.5 to obtain relief from a requirement. Finally, for matters of regulatory or statutory interpretation, the applicant can formally request a legal interpretation from the FAA's Office of the Chief Counsel.

5. Particularly for new or experimental vehicles, it is reasonable and expected that systems and operational parameters will change from launch to launch, as findings are incorporated to create a safer, more reliable service. You have previously noted that license modifications have been more numerous than anticipated and have strained AST's limited resources. What is AST doing to manage the scope of review under license modifications to enable the iteration and flexibility necessary to improve launch operations?

FAA Response: Yes, it is reasonable and expected. In these situations, we look to the operators to try to provide as much advanced notice as possible, work with us to provide the necessary data in a manner that supports our review and their operational schedule, and group modifications by common aspects, criticality/urgency, and other factors. Since part 450 is performance-based, operators can provide the FAA with descriptions of their change management and risk management processes to support their demonstrations of compliance relative to an envelope of expected changes.

When evaluating a request for modification, the FAA reviews the operator's proposed change to

ensure that the operator will continue to operate safely and remain compliant. The FAA will also review the full application to ensure that the operator has identified and addressed all dependencies, to include confirming that data and assumptions used in related analyses remain valid.

6. What guidelines exist to prompt determinations on license updates that contain “no public safety impact” under a certain timeframe?

FAA Response: Operators are required, per regulations, to provide the FAA with updates to their applications that represent “continuing accuracy”. These updates may correspond to changes that are not material to public health and safety or the safety of property. The FAA reviews this material to confirm whether they are not material to safety and, if so, promptly closes out the update.

7. What kinds of waivers are in place for license applications that relate to national security? Would it be in the U.S. national interest for Congress to grant AST statutory authority for more waivers? If so, what specific authorities and waivers would most benefit AST?

FAA Response: There are no waivers for national security, however every request for waiver is required to demonstrate how the FAA’s granting of the request would be in the public interest and would not jeopardize the public health and safety, safety or property, and national security and foreign policy interests of the United States. In waiver requests we have received, operators often point to national security implications, such as impacts of the timing of the launch in question or the future launch on DOD or NASA priorities to demonstrate that granting the waiver would be in the public interest. The FAA considers these implications when making its determination, and the FAA has decided favorably in many of these cases.

8. What near-term actions will AST take, including to transparently inform industry of expectations, to get to a point where the information contained within a single application—including proposed methodologies—can routinely cover multiple launches and/or reentries?

FAA Response: The FAA communicates to industry at the senior management level all the way down to the subject matter expert level our expectations to enable routine multiple launches and reentries through a single license. Second, FAA holds bi-weekly office hour sessions to address industry questions on part 450 and the licensing process, with a focus on flight safety analysis methodologies. The FAA has also conducted multiple industry workshops on flight safety analysis topics which are recorded and available on its website. Additional workshops are planned for this year. Third, FAA has also published multiple ACs that speak to flight safety analysis methodologies, including AC 450.115-2 *Describing Flight Safety Analysis Methods* and AC 413.13-1 *Guide to Submitting a Complete Application*. Fourth, the FAA is working to complete industry guidance as an aid for industry on how to comply with part 450 requirements. Additionally, the FAA sought industry feedback through our Commercial Space Transportation Advisory Committee (COMSTAC) and took that feedback to charter a new aerospace rulemaking committee tasked with exploring targeted improvements to the licensing requirements.

However, licensing is an applicant driven process. The applicant decides the timing of its submittal and proposes the scope of activities to be authorized. Under part 450, applicants can apply for a single license to authorize their entire program, consisting of a portfolio of multiple mission profiles, vehicle configurations, and sites. Part 450 focuses on the approval of an

operator's processes to ensure the operator can accurately demonstrate regulatory compliance without a license modification for each new mission profile. This allows the operator to analyze and submit mission-specific information as a pre-flight deliverable instead of license modifications.

To date, part 450 applicants have generally chosen to apply for authorization of a single flight. The reasons include:

- Short timelines to meet commitments to customers, stakeholders, or shareholders (e.g., submitting a new application less than 6 months out from a scheduled launch date).
- Importance of the first flight to company priorities and finances (e.g., new companies with new vehicles).
- Likelihood of failure on the first flight of a new vehicle is relatively high and could necessitate changes to the design or operations that would require modifications to the application.
- The company has not completed sufficient long-term planning to gather, develop, or submit the data required to apply for future operations.

In practice, these companies submit specific safety analysis products, rather than sufficient descriptions of the processes to derive those safety analysis products. These applications result in a license with a narrow scope because they contain mission-specific data and assumptions in their flight safety analyses, environmental reviews, and other aspects. For example, the FAA has received applications for part 450 licenses containing a single trajectory, as well as applications for part 450 licenses that contain analyses that are valid for a small range of conditions (e.g., wind conditions applicable to just one month). In these cases, AST has waived some of the methodology requirements for the flight safety analyses based on its own independent analysis that demonstrates that the public safety criteria are met for the conditions anticipated during the single operation.

Vehicle operator licenses under part 450 may authorize an operator to conduct launches within a range of launch parameters involving different launch vehicle configurations. However, in order for the license to authorize multiple mission profiles and launch vehicle configurations, an operator must be able to submit license application material to the FAA that includes but is not limited to the following:

- Description of the different launch vehicle configurations that it proposes to launch under vehicle operator license.
- Description of the range of launch parameters including:
 - Range of flight azimuths, trajectories, associated ground tracks and instantaneous impact points, and nominal impact points.
 - Range of intermediate and final orbits of vehicle upper stages for orbital missions.
 - Risk analyses (e.g., expected number of casualties) that envelop the range of proposed launch vehicle configurations and trajectories.
 - Payload classes and information that envelops the payload classes such as orbital parameters (parking, transfer, and final orbits) and hazardous materials and the amounts.
 - A process to make changes to safety analyses that the FAA can review and approve, which can reduce the need to approve mission by mission analysis products as these adjust and change due to mission requirements.

In general, it may be challenging for an operator to provide the above if it continues to make changes to vehicle configurations and mission profiles. However, for operators like SpaceX who already have mature processes and procedures that govern rapid vehicle development, applications under part 450 could focus more on the change management processes, which has the potential to reduce the number of modifications required when constant change is part of conducting these missions.

Responses by Mr. Dave Cavossa

U.S. HOUSE OF REPRESENTATIVES

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

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

Mr. Dave Cavossa, President, Commercial Spaceflight Federation

Questions submitted by Chairman Brian Babin

1. You stated in your written testimony that while FAA is required by law to provide licensing determinations within 180 days, “every single license issued under Part 450 has significantly exceeded this requirement, some by years, in part due to the mandatory pre-application period, which AST has determined is not subject to the 180- day statutory licensing time period.” Rep Garcia asked Associate Administrator Coleman at the hearing about his assertion that AST has issued six licenses under Part 450 and only one was delayed beyond 180 days. Please explain the disparity in your testimony and Mr. Coleman’s assertion.

Mr. Coleman’s statements on the timeline to process licenses are incomplete. It is a fact that FAA takes more than 180 days when reviewing new licenses. During his testimony, Mr. Coleman focused exclusively on the time it takes for FAA to complete licensing once his organization (AST) formally accepts a license as “complete enough” —a threshold tantamount to total completion, per FAA guidance. He stated that AST adjudicates almost all of its license determinations within the 180-day statutory time period. This assertion tells only part of the story. Under Part 450 (specifically 450.35), AST requires a pre-approval of an applicant’s “means of compliance” (MOC)—a process which takes months or years, with applicants finding it takes months to even get a single round of feedback from AST in this process—and represents the majority of time spent on every license evaluation. Yet, AST chooses not to count any of this time against its statutory limits. This is inappropriate. Functionally, this means that AST has chosen to remove itself from timeline accountability for most of the Part 450 process, directly contrary to Congressional intent.

Additionally, the FAA created a tolling mechanism in its regulations that allows AST to pause its review of an application after it has been accepted if the FAA determines that additional information is needed. FAA frequently tolls its review of applications and FAA regulations set no limit on the amount of time that an application may remain tolled, another way around the statutory timeline.

I considered all of this time in my testimony, as it is relevant and consistent with the spirit and letter of the law. Any other accounting is patently incomplete. Stretching this process beyond the 180 days Congress designated after initial screening severely hinders operational progress, harms vital programs of national importance like Artemis, costs companies millions of dollars, and circumvents the will of the Congress.

Critically, AST does not have any statutory limits today for how long it can take to review license modifications—leading to prolonged delays that directly impact key national priorities. AST’s lack of fixed timelines and accountability on license modifications present an issue just as important as its delays processing new licenses. AST has imposed such strict limitations on each Part 450 license that modifications between flights are very often a necessity—even for items clearly with no impact on public safety. We strongly urge the Committee and the Congress to establish reasonable, firm deadlines of not more than 30 days for minor modifications and not more than 60 days for any more significant license modifications, especially those with no impact on public safety, consistent with the bipartisan Garcia-Stevens amendment language adopted by voice vote during the Committee’s markup of the Commercial Space Act of 2023.

- a. Additionally, have any of these licenses been multi-mission Part 450 licenses or just single-mission licenses? If they are single-mission, doesn't this speak to the broken implementation of the regulatory structure?

As of the hearing, all licenses issued under Part 450 had been single mission licenses either by specific requirement or as a result of the strict restrictions imposed by AST that functionally have not allowed for multiple missions unless vehicles or their flight trajectories do not change between flights—which is not possible in development campaigns. Since the hearing, one license has been issued under Part 450 that authorizes two missions within a given time period – which we applaud as a step forward, but does not materially solve AST's broader issues reviewing rocket development cycles. Many companies have initially applied for multi-mission licenses, only to be told by FAA that only a single-mission license would or could be issued.

This speaks to AST's broken implementation of Part 450. One core problem is that AST unnecessarily focuses on minute elements of a means of compliance as they relate to a particular mission that, once accepted, aren't high-level enough to be applicable to subsequent similar missions with the same launch vehicle. While we support AST taking time to protect the nation's interests, this is not tenable, does not serve public safety, and directly harms national civil and national security space priorities.

The Part 450 regulations were intended to reduce the time companies needed to spend obtaining regulatory approval while maintaining public safety, yet they have achieved the opposite—longer review times. Multi-mission licensing must be a key element of that streamlining effort. AST must fix Part 450 and the associated approval process, which includes issuing multi-mission licenses and fixing the means of compliance acceptance process.

2. A July 2023 COMSTAC Regulatory Working Group Report titled "Part 450 – Challenges and Recommendations" stated that applicants reported challenges when utilizing Advisory Circulars, including errors and rejections despite following the guidance provided. Can you speak to benefits and challenges of FAA's Advisory Circulars? Are Advisory Circulars the proper tool moving forward when facilitating compliance with Part 450? What questions and areas of clarification are most ripe to be addressed in future Advisory Circulars?

Advisory Circulars (ACs), when thoughtful and complete, are necessary tools for both applicants and AST's license evaluators to understand how to appropriately proceed through Part 450 reviews. Specifically, properly constructed ACs can clarify definitions, provide example means of compliance for a given requirement, make technical corrections, and offer clarity as to what questions AST is looking to answer with its requirements and what information an applicant must provide. Indeed, Part 450 notes the necessity of ACs many times in the final rule. However, as I noted in my testimony, AST has issued fewer than half of the required ACs—four years after the final rule was published. The delay in issuance of many ACs indicates the FAA itself does not know what type of materials it needs or wants to satisfy certain parts of Part 450. Furthermore, many of the ACs AST has published are incomplete, inconsistent, or counterproductive. For instance, some simply advise operators to fall back on means of compliance previously included in the legacy regulations or provide guidance on how to avoid the applicability of certain Part 450 requirements (e.g., AC 450.139). Applicants have offered feedback to improve specific ACs under the current regime, which has been largely ignored. So, to be clear, while CSF strongly supports AST publishing a complete set of ACs, these ACs must actually provide value. This requires AST to devote appropriate technical resources to ensuring these

ACs are effective and well-considered, and to prioritize this development ahead of its other regulatory initiatives, including human spaceflight regulations, mission authorization, and orbital debris rules.

Furthermore, while ACs have value, they are not a silver bullet. Even with a complete set of published ACs, AST would still face most of its licensing challenges unless it can resolve its ongoing implementation issues under Part 450.

Questions submitted by Ranking Member Eric Sorensen

1. Given the number of issues that witnesses raised, both in written statements and oral testimonies, on the Part 450 regulations, is delaying the 2026 deadline for when operators must use the new Part 450 regulations a viable option?

It appears unlikely that AST will be able to successfully transition existing operators to Part 450 by the March 2026 deadline as a consequence of the issues you reference. More important than performing the transition, Part 450 itself is broken. AST does not have sufficient processes, guidance, or independent technical leadership to manage the few licenses under Part 450 today—let alone the many more that will be under the regime following a transition.

AST must make substantial improvements to its implementation of the Part 450 regulatory regime today, prior to any transition, to ensure U.S. launch and reentry capability is not grounded as a result of AST's internal management challenges. AST should be incentivized to move forward with these changes as soon as possible as many of the fixes identified in my written testimony are within AST's current statutory authority.

2. Regarding the increasing cadence of commercial space launch and reentry activities, what, in your view, are the top priorities that need to be addressed from an infrastructure perspective, and why?

For starters, the federal government must expedite its environmental approval processes for the construction of new space infrastructure, as FAA already does for airport infrastructure. Space infrastructure directly supports national security and vital national civil space efforts like NASA's Artemis Program, yet multi-year review processes are slowing American competitiveness against China. Specifically, FAA must designate space infrastructure as qualifying for categorical exclusions (CATEXs) under the National Environmental Policy Act (NEPA), as it already does for airports, in recognition of their importance. Congress has recently supported similar efforts to apply CATEXs to other important policy areas like semiconductor production and forest management.

Additionally, FAA systems to monitor and integrate new entrants, like space launch and reentry operations, into National Airspace System (NAS) require additional investment and expedited development to support the current and predicted future development. FAA has made a number of process improvements that have facilitated better NAS integration during space launches, but there are various technologies that can be further prioritized, funded, and deployed by FAA that would both improve safety in the NAS and further ensure true integration. CSF appreciates the language and funding found in the House FY25 THUD appropriations bill to "expedite the development, acquisition, and deployment of technologies and capabilities, including automation where appropriate, to aid in space launch and reentry integration into the national airspace and to enable near real-time dynamic rerouting of commercial aircraft during and following commercial space launch and reentry operations," and looks forward to hopefully seeing this passed into law.

Last, but certainly not least, Congress should reinstate and reinvigorate the Space Transportation Infrastructure Matching Grant (STIM) program, which funds spaceport infrastructure around the country. As operational cadence increases, it will be important to ensure as many spaceports have the infrastructure necessary to support these operations as possible. There are many existing spaceports across the country that lack access to federal infrastructure grants to improve their common-use infrastructure. CSF applauds Senators Hickenlooper, Cornyn, Lujan, and Wicker for introducing the SPACEPORT Act in the Senate, which would make key tweaks to enhance the effectiveness of the STIM program and encourage AST to bring the program back. Notably, Rep. Caraveo offered the SPACPORT Act as an amendment to H.R. 6131, the Commercial Space Act of 2023, which should be adopted before H.R. 6131 moves forward. To that same end, to unlock as much private capital as feasible to supplement these needed federal appropriations for the nation's spaceport infrastructure, Congress should pass H.R. 7470, the Secure U.S. Leadership in Space Act of 2024 sponsored by Representatives Dunn and Carbajal in the House. There is also a Senate companion, S. 3823, offered by Senators Rubio and Lujan. This bill opens the possibility for tax-exempt infrastructure bonds for spaceports, which have been effective for ports and other forms of infrastructure in maximizing private capital availability to support infrastructure improvements. This is vital as there is clearly growing market demand for spaceport infrastructure.

Questions submitted by Full Committee Ranking Member Zoe Lofgren

1. To what extent can the development of voluntary industry consensus standards contribute to establishing means of compliance for FAA's launch and reentry regulations?

CSF supports the development of voluntary consensus standards as a potential means of compliance for operators. In theory, this would streamline and expedite the application process for elements of a license, particularly for new operators. However, in practice, AST has required extreme specificity for each applicant and each operation—well beyond what is actually required under Part 450—which would preclude the possibility of a voluntary consensus standard supporting multiple operators. This is a consequence of incomplete or insufficient processes within AST to standardize application reviews and processing. CSF has strongly recommended a top-to-bottom review within AST to address this critical shortfall. Once addressed, consensus standards could be a valuable tool so long as (1) these standards do not become the only means of compliance to obtain a license and (2) AST has the technical resources to commit to such an endeavor without negatively impacting the current licensing backlog.

2. During the question-and-answer session at the hearing, I asked whether user fees might be considered as a means to ensure FAA has the necessary resources to meet the increasing demand for launch and reentry licenses, especially under the new Part 450 rules. What are your perspectives on user fees?

At this time, mandatory user fees for launch and reentry licensing are not appropriate. Mandatory user fees would erode U.S. industry's ability to compete internationally and would increase prices for the USG and the American taxpayer both by reducing competition and by acting as an additional tax. Today, the launch and reentry industry simply is not mature enough to shoulder these fees. CSF appreciates that Congress continues to appropriate adequate funds to AST to focus on its licensing mandate and supports continued oversight of the office to ensure taxpayer dollars are being used to meet the statutory obligations of the office rather than expanding regulatory scope outside what Congress has authorized.

CSF does support other innovative mechanisms to help enhance AST's resources, specifically surrounding proper technical expertise. For example, CSF endorsed the Garcia-Stevens amendment to H.R. 6131, the Commercial Space Act of 2023, that would establish a pilot program that would, among other things, allow AST to obtain outside agency support service to aid in licensing on a reimbursement basis at a company's request.

Responses by Ms. Pamela L. Meredith

Responses by Pamela Meredith 2024-11-05

Questions submitted by Chairman Brian Babin

1. In your written testimony, one of the issues you raised with Part 450 focused on the difficulty in obtaining waivers for regulatory requirements. Can you expand on why you believe that FAA is so hesitant to grant waivers? Additionally, how could waivers help to mitigate the challenges associated with the Part 450 process?

Written Testimony: Likewise, waivers of regulatory requirements are not always easy to obtain and may not be possible to obtain. An applicant needs to show that not complying with a regulatory requirement 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 U.S.¹

Response

The FAA AST has the statutory authority to issue a waiver of a regulatory “requirement, including the requirement to obtain a license, for an individual applicant if the [AST] 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.”² Certain exceptions apply.³ AST has implemented the waiver authority in its regulations.⁴

The AST issues waivers with some regularity but generally for minor matters. AST could make greater use of waivers, but AST’s regulatory approach and apparent risk aversion may account for its reluctance.

The Use of Performance-based Standards

In adopting Part 450, AST made a conscious move towards replacing many of the prescriptive rules in the old regulations with performance-based requirements to give license applicants more flexibility in how to comply should reduce the need for waivers.⁵ In addition to giving

¹ 51 U.S.C. § 50905(b)(3); 14 C.F.R. § 450.37.

² 51 U.S.C. § 50905(b)(3).

³ For example, “the Secretary may not grant a waiver under this paragraph that would permit the launch or reentry of a launch vehicle or a reentry vehicle without a license or permit if a human being will be on board.” 51 U.S.C. § 50905(b)(3).

⁴ 14 C.F.R. § 404.5 (Filing a petition for waiver).

⁵ Wayne Monteith, the previous Associate Administrator for Space Transportation, and his staff explained: “Prescriptive process or design requirements often require the issuance of multiple waivers or equivalent level of safety determinations to allow innovation or even growing business practices, because the regulations rely on experienced design to ensure safe operation.” Wayne Monteith, Josh Easterson, and John Sloan, Streamlining FAA Commercial Space Transportation Regulations, 70th International Astronautical Congress (IAC),

applicants the opportunity to select, *i.e.*, to select a means of compliance (“MOC”),⁶ Part 450 allows applicants that cannot comply with a regulatory requirement the flexibility to show an equivalent level of safety (“ELOS”).⁷

In practice, the need for AST to evaluate and approve an MOC or ELOS delays the licensing process. To alleviate this problem, AST has issued Advisory Circulars (“AC”) with pre-approved MOC for applicants to choose from for some regulatory requirements,⁸ but more is needed.⁹ Also, applicants with unique technologies that are unable to satisfy a pre-approved MOC will still need individual evaluation of an applicant-proposed MOC.

For applicants or licensees that cannot comply with a regulatory requirement or that require a more timely resolution, e.g., for an upcoming launch, requesting a waiver is an option. This requires filing a petition “at least 60 days before the proposed effective date of the waiver” unless AST agrees to a shorter timeframe.¹⁰ The petitioner must demonstrate that the waiver is in the public interest and will not jeopardize the public health and safety, safety of property, and U.S. national security and foreign policy interests.¹¹

Washington, United States, (21-25 October 2019), available at https://www.faa.gov/sites/faa.gov/files/space/additional_information/international_affairs/Streamlining_FAA_Regulations_IAC_Washington_Monteith.pdf.

⁶ See, e.g., 14 C.F.R. § 450.37 (requiring an applicant to comply with requirements in Part 450 unless the applicant can demonstrate an equivalent level of safety to a requirement). See also FAA, Streamlined Launch and Reentry License Requirements, Final Rule, 86 Fed. Reg. 79566, 79567 (Dec. 10, 2020) (“Part 450 Final Rule”) (“In addition, this rule replaces many prescriptive regulations with performance-based rules, giving industry greater flexibility to develop means of compliance that meet their objectives while maintaining public safety.”).

⁷ See *Part 450 Final Rule*, *supra* note 6, 86 Fed. Reg. at 79576 (“To use an ELOS, an operator may demonstrate that an alternative approach provides an equivalent level of safety to a requirement in accordance with § 450.37.”). Exceptions apply.

⁸ Federal Aviation Administration, Commercial Space Advisory Circulars (ACs), <https://www.faa.gov/space/legislationregulationguidance/commercial-space-advisory-circulars-ac/commercial-space> (last visited Nov. 4, 2024).

⁹ For example, AC 450.115-1B (issued Aug. 2, 2024) refers to important ACs that have not yet been published: AC 450-113-1, Level of Fidelity; AC 450.119-1, High-Fidelity Malfunction Trajectory Analysis; and AC 450.137-1, Distant Focusing Overpressure (DFO) Risk Analysis. Likewise, AC 450.117-1 (issued Aug. 19, 2021) refers to ACs that also have not yet been published: AC 413.5-1, Pre-Application Consultation; AC 450.115-2, Medium-Fidelity Flight Safety Analysis; AC 450.119-1, High-Fidelity Malfunction Trajectory Analysis.

¹⁰ 14 C.F.R. § 404.5(a) (“A petition for waiver must be submitted at least 60 days before the proposed effective date of the waiver, unless the Administrator agrees to a different time frame in accordance with § 404.15.”).

¹¹ 14 C.F.R. § 404.5 (Filing a petition for waiver):

(b) The petition for waiver must include: (1) The specific section or sections of 14 CFR chapter III from which the petitioner seeks relief; (2) The extent of the relief sought and the reason the relief is being sought; (3) The reason why granting the request for relief 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; and (4) Any additional facts, views, and data available to the petitioner to support the waiver request.

A 60 day requirement (or waiting for AST to agree to a shorter timeframe) is not always practical. The AST could be asked to consider whether it could commit – at least as an AST policy matter – to a shorter, say a 10 day period, for situations where an applicant can demonstrate that the same waiver was granted to it on a previous occasion or that there is no impact on public safety. The downside with requiring AST to act within a shorter period of time is that it may lead unnecessarily to a denial of the waiver because there is insufficient time to evaluate.

Apparent Risk Aversion

In evaluating whether to grant a waiver, AST must decide whether the petitioner meets the statutory waiver requirements. The AST applies a three step evaluation process: (i) Whether the waiver will jeopardize public safety; (ii) whether the waiver will jeopardize U.S. national security or foreign policy interests; and (iii) whether the waiver is in the “public interest.” Public interest factors include purposes articulated in the Commercial Space Launch Act, such as promoting economic growth and entrepreneurial activity in space transportation.¹²

Issuing a waiver may entail setting aside a regulatory requirement imposed in the first instance because AST deemed it necessary to “protect the public health and safety, safety of property, and national security and foreign policy interests of the United States.”¹³ In such situations, issuing a waiver is contrary to a risk-averse mindset. The greater the risk perceived in granting a waiver, the greater the reluctance.

For example, where casualty thresholds are involved, granting a waiver will typically carry – or be perceived to carry – a higher degree of risk. For example, Part 450 imposes an expected casualty threshold for reentry vehicles¹⁴ that few if any current reentry vehicles can meet. Yet this threshold remains a regulatory requirement. The threshold will need to be changed. In the interim, before the change can be accomplished, AST should be liberal in granting waivers provided the petitioner can show that the waiver will not impact public safety and granting the waiver is in the public interest. If a general waiver cannot be granted (the statute says waivers may be granted for “an individual applicant”¹⁵), AST should provide guidance to individual petitioners on mitigation measures that may qualify for a waiver.

¹² 51 U.S.C. § 50901(b). *See, e.g.*, FAA, Waiver of Acceptable Risk Restriction for Launch, 81 Fed. Reg. 1472, 1473 (Jan. 12, 2016) (“The waiver [granted to SpaceX] is consistent with the public interest goals of Chapter 509 and the National Space Transportation Policy. Three of the public policy goals of Chapter 509 are: (1) To promote economic growth and entrepreneurial activity through use of the space environment; (2) to encourage the United States private sector to provide launch and reentry vehicles and associated services; and (3) to facilitate the strengthening and expansion of the United States space transportation infrastructure to support the full range of United States space-related activities.”).

¹³ 51 U.S.C. § 50901(b)(3).

¹⁴ 14 C.F.R. § 450.101(c)(2).

¹⁵ 51 U.S.C. § 50905(b)(3).

AST may have a lingering unease with waivers as a result of a waiver it granted to Scaled Composites on its own initiative in 2013 for a Virgin Galactic crewed test flight. The AST waived “the hazard analysis requirements . . . for software and human error”¹⁶ A subsequent spaceflight under the waiver ended in a mid-air breakup of the vehicle and the death of one crew member and serious injury to the other. In a subsequent NTSB investigation,¹⁷ the accident was tied to the waiver and AST was taken to task:

FAA/AST issued the waivers without understanding whether the mitigations would adequately protect against a single human error with catastrophic consequences. In addition, the FAA/AST did not determine whether mitigations, other than those intended to protect against human error, were sufficient to ensure public safety.¹⁸

The NTSB report listed a number of recommendations to shore up the AST’s waiver practices. While many of the recommendations were directed at experimental permits (the type of authorization provided to Scaled Composites for the calamitous flight), some were of a more general nature, e.g., including to provide “clearer guidance” on evaluation of waiver requests¹⁹ and to develop and implement procedures and guidance for confirming that licensees are “implementing the mitigations” identified in the waivers.²⁰

Priorities and Insufficient Resources

In preparing this submission, I have not found any publicly available materials on guidance or procedures for waivers from AST that follow from the NTSB recommendation, other than a one-page document from 2022 that merely reiterates the requirements in the statute and regulations.²¹

¹⁶ FAA, Waiver of 14 CFR 437.29 and 437.55(a) for Scaled Composites, LLC, 78 Fed. Reg. 42994, 42995 (July 18, 2023).

¹⁷ In-Flight Breakup During Test Flight, Scaled Composites SpaceShipTwo, N339SS, Near Koehn Dry Lake, California, October 31, 2014, Aerospace Accident Report, NTSB/AAR-15/02, PB2015-105454, available at <https://www.ntsb.gov/investigations/AccidentReports/Reports/AAR1502.pdf> (“NTSB Report”).

¹⁸ NTSB Report, at vii.

¹⁹ NTSB Report, at 71 (“Direct Office of Commercial Space Transportation (AST) management to work with AST technical staff to (1) develop clearer policies, practices, and procedures that allow direct communications between staff and applicants, (2) provide clearer guidance on evaluating commercial space transportation permits, waivers, and licenses, and (3) better define the line between the information needed to ensure public safety and the information pertaining more broadly to ensuring mission success.”).

²⁰ NTSB Report, at 70 (“Develop and implement procedures and guidance for confirming that commercial space operators are implementing the mitigations identified in a safety-related waiver of federal regulations and work with the operators to determine the effectiveness of those mitigations that correspond to hazards contributing to catastrophic outcomes.”).

²¹ Waivers for FAA Licensed Launch or Reentry Activity (September 14, 2022) <https://www.faa.gov/space/searchresources/waivers-faa-licensed-launch-or-reentry-activity>. Furthermore, I do not see an Advisory Circular for waivers. See FAA, Commercial Space Advisory Circulars (ACs), <https://www.faa.gov/space/legislationregulationguidance/commercial-space-advisory-circulars-ac/commercial-space> (last viewed Nov. 1, 2024).

This may be down to the reasons discussed above in addition to a large workload, office priorities and/or short staffing.

2. Among the recommendations in your written testimony, you stated that the Committee may wish to ensure that AST is prepared for the transition of licensees operating under legacy rules to Part 450. In your option, what should this Committee do to ensure that AST is fully prepared for the transition to Part 450?

Written Testimony: The Committee may also wish to ensure that AST is prepared for the transition to Part 450 of launch licensees currently operating under the legacy rules. To ensure that the transition can be accomplished without interruption of commercial launch operations, including AST-licensed launches of U.S. government payloads. (Some launch companies that had licenses at the effective date of Part 450 opted to continue operating under the old regulations.) The deadline for the transition is March 10, 2026.

Response

As noted, Part 450 replaced many of the prescriptive rules in the old regulations with performance-based rules that give the applicant flexibility as to how they satisfy the rule.²² The downside with this approach is that it is not always clear that AST will find an applicant-proposed MOC acceptable in a given situation or for a given technology. To mitigate this uncertainty, AST has adopted ACs that set forth acceptable MOC for certain rules. As of this writing, there are 21 ACs for Part 450,²³ but many important safety requirements in Part 450 remain without MOC guidance.²⁴ This limbo state may cause licensing uncertainty and delay.

The AST should be required to *complete the process of adopting ACs* for all key regulatory requirements by the time of the transition. ACs should be succinct and avoid unnecessary embellishment. For example, AC 413.13-1 - Guidance on Submitting a Complete Enough and Complete Application for a Vehicle Operator License, which is intended to give guidance to a prospective applicant on the content of a license application is 69 pages long and prolongs the pre-application process and raises the issue of whether the statutory 180 day statutory application review period²⁵ is meaningful.

²² Where possible, the FAA has adopted performance standards, and considered the prescriptive requirements for placement in advisory circulars (AC) that will identify possible means of compliance, but not the only means of compliance, with this rule.”

²³ Federal Aviation Administration, Commercial Space Advisory Circulars (ACs), <https://www.faa.gov/space/legislationregulationguidance/commercial-space-advisory-circulars-acs/commercial-space> (last visited Sept. 4, 2024).

²⁴ See *supra* note 9.

²⁵ 51 U.S.C. § 50905.

AST guidance documents by should be meaningful. Merely reiterating the requirements of the statute and regulations, such as the one-page waiver policy document discussed above,²⁶ is not helpful beyond gathering the legal authorities in the same place.

The *waiver* of the expected casualty threshold for reentry vehicles,²⁷ discussed at page 3, above would need to be granted prior to the transition to Part 450 to allow reentry operators currently licensed under the legacy rules to transition without disruption to operations.

Pending the adoption of ACs for MOCs, AST could also consider *creating a database* of approaches to safety requirements and applicant-proposed MOCs that have been approved AST but not yet documented in an AC and that are of general interest to applicants. The database should be generic and strip out identifying information on the applicant and specific mission.

As of this writing, the transition to Part 450 is less than 18 months away. AST should be encouraged to be proactive in ensuring that it is prepared for the transition, including by providing a streamlined guidance document on the transition process and reaching out existing licensees operating under the legacy rules to reduce disruption to ongoing operations by the transition.

Questions submitted by Ranking Member Eric Sorensen

1. Given the number of issues that witnesses raised, both in written statements and oral testimonies, on the Part 450 regulations, is delaying the 2026 deadline for when operators must use the new Part 450 regulations a viable option?

The transition to Part 450 is inevitable and will be difficult regardless of timing. Deadlines are generally an effective motivator for achieving a goal and holding AST's feet to the fire may spur it to take the necessary measures. That said, the decision on whether the transition should be postponed may be premature at this point. If AST is encouraged now to take the steps discussed in Response 2 above among others, the Committee could request a briefing from the Associate Administrator for Commercial Space Transportation, or hold a hearing, ten months from now to determine whether AST is ready for the transition.

²⁶ See *supra* note 21 (guidance on waivers).

²⁷ 14 C.F.R. § 450.101(c)(2).

Appendix II

ADDITIONAL MATERIAL FOR THE RECORD

LETTER SUBMITTED BY REPRESENTATIVE BRIAN BABIN



September 10, 2024

The Honorable Brian Babin
United States House of Representatives
2236 Rayburn House Office Building
Washington, D.C. 20515

The Honorable Eric Sorensen
United States House of Representatives
1205 Longworth House Office Building
Washington, D.C. 20515

Chairman Babin, Ranking Member Sorensen:

Chairman Babin, Ranking Member Sorensen, and Members of the Committee: as the world's leading space transportation and space services provider, SpaceX is proud to support America's civil, national security, and commercial space enterprise. Today, from our facilities in Florida, Texas, and California, SpaceX launches astronauts, scientific satellites, and other critical equipment to orbit and beyond for the National Aeronautics and Space Administration (NASA); the full range of Department of Defense (DOD) and Intelligence Community spacecraft; the majority of the world's commercial satellite launches; and Starlink, our high-speed, low-latency satellite broadband system serving well over 3.5 million households and businesses today and helping to close the digital divide around the world. On average, SpaceX launches one of our Falcon rockets every 2.5 days, and we are in the process of ramping up flight rate for our next-generation Starship vehicle, which is returning American astronauts to the Moon in 2026 in partnership with NASA under the Artemis Program. In every operation, safety is our absolute priority.

The Department of Transportation (DOT) is responsible for regulating commercial space launches and reentries **"only to the extent necessary...to ensure compliance with international obligations of the United States and to protect the public health and safety, safety of property, and national security interests and foreign policy interests of the United States."**¹ Since 1995, DOT has delegated this authority to the FAA Office of Commercial Space Transportation (AST).² Using legacy DOD technical procedures as a foundation, AST established a regulatory framework spanning Parts 415, 417, 431, and 435 to encompass launch, reentry, and reusable launch vehicle operations. As commercial space activity accelerated in the past decade, it quickly became clear that these legacy regulations were stagnant, prescriptive, and insufficient for supporting continued innovation or incorporating new means of improving public safety. In 2018, Space Policy Directive-2 (SPD-2) mandated that DOT (by extension, AST) update these regulations to appropriately support the rapid pace of industry innovation while continuing to protect public safety. In response, AST published the updated Part 450 rule in 2020, which sought to consolidate the prior regulations and introduce new efficiencies. AST allows companies to continue operating under the legacy framework with existing systems (e.g., SpaceX's Falcon and Dragon vehicles) until 2026, but requires that all new vehicles (e.g., SpaceX's Starship rocket) be licensed under Part 450.

¹ <https://www.congress.gov/bills/98th/congress/house-bill/3942/text>

² https://www.faa.gov/sites/faa.gov/files/space/additional_information/international_affairs/THE_ORIGIN_AND_PRACTICE_OF_US_COMMERCIAL_HUMAN_SPACE_FLIGHT_REGULATIONS_IAC_Glasgow_Oct_2008.pdf

In developing Part 450, AST sought to “maintain safety, simplify the licensing process, enable innovation, and reduce costs to help our country remain a leader in commercial space launches.”³ AST’s implementation of this new rule, however, has resulted in the opposite.

AST’s implementation of Part 450 has dramatically complicated the licensing process, driven lengthy and uncertain timelines even for license modifications, suppressed innovation, and increased costs to both operators and FAA. These issues have been long-identified and yet remain unaddressed. The impacts to national space programs like Artemis are now being realized in schedule delays and slowed development.

I. Part 450 Implementation Issues

Although the Part 450 regulations are inherently flawed, AST could address many of these problems through better management and implementation of the regulatory requirements.

- 1) **Lack of published guidance for Part 450.** In developing Part 450, AST laid out a two-part strategy to release both the rule itself and a series of Advisory Circulars (ACs) that provide guidance with how to comply with the performance-based requirements. Indeed, the Part 450 final rule repeatedly highlights the vital import of ACs throughout.⁴ **Nearly five years after the publication of the final rule, AST has only published a fraction of the required ACs. Compliance guidance for nearly all the most complex or new technical requirements in Part 450 remain unpublished.**

ACs are fundamental to ensuring that both industry and AST understand the intent of a given requirement. Without them, a license evaluation is clouded in uncertainty.

AST’s stated intent is to publish ACs with example means of compliance to a requirement. Thus far, only one AC meets this intent; others are academic and devoid of specificity, and thus fail to articulate compliance for either applicants or AST analysts charged with evaluating a license. A lack of shared interpretation of requirements is generally the longest lead issue SpaceX and other operators experience under Part 450.

- 2) **Unbounded, Ungrounded Data Calls.** Due to the absence of published internal or external guidance for Part 450 implementation, AST analysts often request significant additional information and analysis, often unmoored to any specific regulatory requirement. In many cases, these data calls appear to be purely academic in nature. The absence of standardization and guidance for analysts is a major shortcoming in AST’s current implementation of the regulation, which drives considerable uncertainty and delays.
- 3) **Adoption of Unique Means of Compliance.** Foundational to Part 450’s performance-based model is approving unique means of compliance for different vehicle systems to reach high-level public safety requirements. However, AST has fallen far behind in these reviews for vehicles with novel, innovative operational approaches like Starship. For each new means of compliance proposed, operators face seemingly endless cycles of AST requests for more information, even when such information clearly falls outside the scope of the license or even AST’s statutory responsibility to protect public safety.

³ <https://www.faa.gov/newsroom/faq-rule-would-streamline-commercial-space-launch-and-reentry-requirements>

⁴ <https://www.federalregister.gov/d/2019-05972/page-15336>
<https://www.federalregister.gov/d/2020-22042/page-79575>

While AST has criticized operators for submitting incomplete material, this is a direct result of AST's failure to establish a clear, transparent, and predictable regulatory regime under Part 450. Nevertheless, SpaceX works diligently to improve its strategies for documenting and submitting analyses, processes, and procedures to try to meet what we *think* is AST's intent in a requirement. SpaceX typically responds to an AST request for additional iteration in 3 days or less, and often substantially less. But AST often takes much longer, often moving goal posts or venturing into academic or technical excursions. To meet these AST requests, SpaceX must routinely iterate documents for each license modification *more than 50 times*, directly delaying launch schedules.

- 4) **Methodologies.** Part 450 was never intended to be implemented on a launch-by-launch basis, but instead to license overall vehicle operations. SpaceX has attempted to enable this by developing methodologies for AST to evaluate and utilize as a means of compliance. But given the lack of standardization and guidelines for AST reviewers, distributed decision-making across numerous and often unclear technical staff, and disagreements of interpretation in the regulations, this effort has been largely unsuccessful. Even this attempt at efficiency drives more work and more delays, and AST is currently unable to simultaneously evaluate licenses *and* methodologies—forcing operators to choose continued regulatory inefficiency in order to fly.

SpaceX has strongly encouraged AST to continue to accept methodologies utilized under the legacy requirements, especially those used today by the Falcon program. Here, too, **AST routinely rejects these methodologies under Part 450 without any clear explanation of why.** In one instance prior to Starship's first flight, AST required SpaceX to invent a new, bespoke analysis that took eight months to approve—**this alone far exceeded the entire 180-day limit for license processing under Part 450**—instead of reusing a process utilized by the Falcon program that met AST's own safety goals.

- 5) **Regulatory Inefficiency.** As an example of regulatory inefficiency driven by implementation rather than the regulation itself, AST has required SpaceX to update unchanged documentation for unchanged operations for *each* Starship flight, without any rationale supported by the regulation itself. This is untenable for Starship, which is attempting to achieve a high experimental flight rate. For mature systems like Falcon, Part 450 will simply be untenable if AST continues implementation in this fashion.

Even minor updates to a license can add to schedule issues. Operators routinely make small changes on items with no impact to public safety, but AST does not have a policy, or any guidance, that differentiates between major and minor license modifications, or between these and revised information necessary for continuing accuracy within a license. This means that even an inconsequential change to a license can subject an operator to excessive and unpredictable schedule delays while the request filters through AST's multi-layered review. There is currently no apparent strategy or mechanism to assess the likelihood and consequence of a risk, and to prioritize resources appropriately.

Further, AST is regularly late in providing final interpretations of requirements that drive licensing timelines. Without standardized internal or external guidance from AST, the process grinds down with inefficiencies, conflicts, and late requests from AST that delay license issuance. This practice leads to AST adopting short-term fixes to maintain schedule rather than employ long-term solutions. This practice is most evident in a license's terms and conditions.

- 6) **Regulatory Stove Pipes.** AST's organizational structure routinely exacerbates these issues. There is no single decision-maker or technical authority for the completion of a license. There

is no “owner” responsible for a result. Instead, various elements of the license are divided into different technical organizations. This structure directly increases review time and inhibits problem solving. When each of these groups disagree with each other, AST lacks an adjudicating internal technical authority, such as an Independent Technical Authority or Chief Engineer. As a result, it will ask operators to keep providing more information, AST analysts will continue to have more comments, and decisions will continue to be deferred. When a license is finally ready for final review, AST currently has a multi-layered review process that in and of itself takes 4-5 weeks, a structural inefficiency—in other words, even if a license modification was perfect at submission, it would still take AST one month to review it.

AST must develop standards for developing and approving unique means of compliance, both internally and for operators, that differentiate expectations for developmental versus operational launch or reentry systems. Additionally, AST must publish high-quality ACs that provide a prescriptive option for compliance as well as clarify a requirement’s purpose and intent. With four years of experience regulating under Part 450, AST should also publish clear guidance on standards for license modifications versus continuing accuracy updates to improve efficiency under Part 450. This will reduce uncertainty for operators and better standardize how AST reviews licenses. AST must also establish an Independent Technical Authority to oversee all technical discussions for a license, which are currently managed individually within each AST branch. This independent authority would create a focal point for license ownership within AST to resolve technical reviews in a timely fashion and oversee appropriate collaboration between otherwise discrete analysis branches.

Finally, AST must eliminate unnecessary cycles of review for items that clearly have no impact on public safety by ensuring feedback to operators includes a clear connection to the regulation and explains the impact to public safety.

- 7) **Lack of Transparency.** A lack of agreed upon schedule between AST and operators hampers rapid innovation, a critical feature of a healthy commercial space industry. This exercise is a two-way street, and a schedule developed jointly by both AST and operators holds both sides accountable. Unfortunately, AST does not provide transparency on where it stands with its reviews but requires operators to provide insight into their own schedules. A jointly maintained schedule is necessary for adequate planning of launch operations, especially when license approval consistently remains on the critical path. AST also routinely utilizes statutory timelines when describing external agency consultations that often conflict with AST analyst estimates. Recently, SpaceX experienced this issue when AST shifted a license determination date for Flight 5 from mid-September to end of November, an extension driven entirely by environmental consultation timelines.

Without transparency, operators cannot adequately plan or meet customer needs, an issue that ultimately cascades throughout an entire operation and program. SpaceX experiences this today with Starship licensing, where every license review—even for a minor modification—drives considerable program schedule uncertainty for our future Moon missions for NASA. This impact directly counters statute and policy guidance which state AST must facilitate and promote commercial space transportation activity and minimize uncertainty in the licensing process.⁵

- 8) **Regulatory Duplication and Conflict.** Commercial space operators utilize Federal ranges and services for launch and reentry operations, which often requires significant coordination with multiple government agencies. When Part 450 was promulgated, AST provided operators a

⁵ §50903(b)(1), <https://uscode.house.gov/view.xhtml?path=/prelim@title51/subtitle5/chapter509&edition=prelim>

pathway to streamline licensing efforts via use of Federal services at a launch or reentry site. The regulation states:

“FAA will accept any safety-related launch or reentry service or property provided by a Federal launch or reentry site or other Federal entity by contract, as long as the FAA determines that the launch or reentry services or property provided satisfy this part.”⁶

This requirement is critical for eliminating duplicative, unnecessary effort, which has been mandated by Congress and this Committee. Leveraging Federal services under Part 450 has been confusing and cumbersome for operators because AST often continues to impose its own separate requirements even when they have already been addressed by another agency. AST has also elected to evaluate another agency’s review (e.g., NASA or DOD) even though their processes are well-defined and have been in use often for decades, validating public safety effectiveness. This inter-agency conflict has driven considerable confusion for operators and must be swiftly addressed. AST should not be regulating Federal Ranges by proxy simply because commercial operators launch from Federal facilities or utilize Federal services.

- 9) **Additional Technical Resources.** AST must hire more technical expertise to match the growing pace of license reviews, hire efficient, qualified contractors, or increase reliance on licensed operators for technical support. AST has insufficient resources to adequately execute the workload placed on them and cannot manage both license approval efforts and deliver policy and guidance updates in parallel. As a result, AST and SpaceX are consistently forced to choose between licensing priorities across multiple programs. Guidance is deferred. Methodologies are deferred. Advisory Circulars are deferred.

Further, AST is often inefficient with the technical resources it does have. AST experts are assigned to review work that is not relevant to their skillsets, which delays review timelines. Delays may also be incurred when AST seeks consensus from external contractors or groups like the Common Standards Working Group (CSWG) to provide concurrence on a technical approach. The CSWG has no industry representation, has non-transparent processes of review and relies upon unpublished analytical artifacts for its decisions, and does not publish or pre-notify its actions—it is a black box and should be eliminated entirely and replaced with a more transparent and accountable working group.

While Congress has routinely provided AST additional funding to support license review, AST has not prioritized expedited hiring for qualified engineers. These resources should be *specifically (and only)* authorized and appropriated for the AST Licensing Division. Additionally, more resources will be for naught if AST is unable to timely and efficiently hire—Congress should empower AST to use expedited hiring authorities to rapidly grow its workforce. This must be coupled with other creative solutions such as providing AST with new authorities to enable license applicants to self-fund qualified, third-party technical organizations to bolster and expedite AST license review where needed.

II. Part 450 Structural Issues

While Part 450 is intended to improve regulatory certainty and enhance flexibility, it contains numerous contradicting, confusing, and non-executable requirements that instead reduce clarity and hamper flexibility. After AST published a draft Part 450 rule in 2019, SpaceX and dozens of other entities submitted comments to the public docket identifying these problems.⁷ In large measure, AST did not address these

⁶ [https://www.ecfr.gov/current/title-14/part-450#p-450.45\(b\)](https://www.ecfr.gov/current/title-14/part-450#p-450.45(b))

⁷ <https://www.regulations.gov/comment/FAA-2019-0229-0168>

concerns, and the predicted issues have come to fruition. Below is a sampling of some of the many significant structural issues, which must be rectified through a formal rulemaking process.

1. **Part 450 functionally prohibits all reentry operations, including those currently accepted under AST's legacy requirements.** Reentry operations are a critical element of space activity; astronauts and cargo are launched on spacecraft that must safely return to Earth. Unlike orbital launch operations, which typically take place on the coast and out over oceans, reentry operations may overfly land to reach their targeted landing sites. This requires highly reliable reentry vehicles that not only protect their occupants, but also the public they overfly. Under AST's legacy regulations, SpaceX has successfully performed 46 reentries on our Dragon vehicles, including 12 with astronauts. While prescriptive, these requirements are well-understood, appropriate, and consistent with decades of engineering precedent.

Historically, AST measured launch and reentry risk to the public via two metrics that appropriately consider vehicle reliability. Part 450 introduced conditional expected casualty (CE_c) as a third evaluation requirement. AST previously utilized CE_c as a tool under its legacy regulations to assess launch risk exposure without considering a vehicle's reliability. However, Part 450 codifies this launch tool into a regulatory requirement for both launch and reentry, with clear consequences.

While Part 450 provides some insight into how to apply CE_c for launch operations, it does not include any guidance on how to use CE_c in reentry risk evaluation despite operators' requests.⁸ AST has published an AC that discusses CE_c ; however, the document is not usable as it includes no rationale on the use of CE_c for reentry operations and no unique guidance or discussion on reentry vehicles.⁹ This makes licensing a reentry operation under Part 450 impossible without waiving the requirement altogether as operators simply cannot meet CE_c requirements for trajectories that overfly public and land at locations like Kennedy Space Center, White Sands Space Harbor, or even offshore locations in the Gulf of Mexico or Atlantic Oceans. Part 450 even includes a footnote that acknowledges that "under part 450 [reentry operations] would either need to be modified ... or be granted a waiver."¹⁰

More broadly, Part 450 does not appropriately differentiate between launch and reentry activity, despite their inherent, significant differences. As a result, companies must seek waivers from launch requirements to perform a reentry, forcing both AST and industry to spend unnecessary time to evaluate added complexity introduced by an unworkable set of requirements and does not improve public safety.¹¹

Finally, because of vague wording, Part 450 unintentionally requires FAA to disregard its own prior approvals for active reentry operations, even those it has long licensed and that have been certified by NASA. This means that both operators and AST have to re-open approved reentry licenses without any justification, again adding unnecessary work, time, and cost. SpaceX has elected to continue to license its Dragon spacecraft reentries under the legacy regulations for as long as possible to avoid disrupting key national priorities like flying NASA astronauts safely back from space, but must transition to Part 450 by March 2026 under current AST timelines. It is unlikely that AST will be able to complete its requisite reviews in this timeline and likely that future spacecraft reentries beyond 2026 will be thrown in to unnecessary jeopardy.

<https://www.regulations.gov/comment/FAA-2019-0229-0120>

<https://www.regulations.gov/comment/FAA-2019-0229-0082>

⁸ <https://www.regulations.gov/comment/FAA-2019-0229-0168>

⁹ https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_450.101-1B.pdf

¹⁰ <https://www.federalregister.gov/d/2020-22042/p-511>, Footnote 59

¹¹ <https://www.federalregister.gov/documents/2020/12/10/2020-22042/streamlined-launch-and-reentry-license-requirements>

AST should swiftly revise Part 450 to remove the prescriptive CE_c metric for reentry operations and instead allow operators to utilize legacy means of compliance or flexible performance-based requirements that enable reentry operations while also maintaining public safety. AST should also modify Part 450 to accept proven means of compliance under the legacy requirements as an option, but not the only option, to determine flight safety risk. This will maintain public safety and reduce unnecessary burden for both AST and operators. More broadly, AST must update Part 450 to remove inappropriate or inapplicable launch requirements from reentry operations.

2. **In many cases, Part 450 is far too prescriptive, while in others it is far too vague; together, it makes it nearly impossible to chart an efficient licensing path.** While AST was able to inject flexibility in several requirements, the overall approach to public safety in Part 450 largely mimics the legacy launch safety approach in Part 417. AST attempted to stretch the themes of Part 417 to be universal and take out prescription. However, what operators are left with is a Part 450 that does not maximize flexibility but still inherits some prescriptive requirements—*the worst of both worlds*.

For example, probability of failure (i.e., vehicle reliability) is a critical to understanding a launch or reentry operation's risk to the public. While there are several proven methods by which a launch or reentry vehicle's reliability can be measured, Part 450 only allows one.¹² This is the opposite of a flexible, performance-based model. Ironically, this prescription also contains vague requirements. AST requires operators to incorporate flight histories from other vehicles "developed and launched or reentered in similar circumstances" with no guidance on what constitutes "similar circumstances."¹³ This is clearly inappropriate. Further, Part 450 inexplicably prohibits analyses utilized traditionally by reentry operators, which have long been successfully applied to protect public safety.¹⁴ AST has not presented any evidence that the legacy requirements result in unsafe operations. However, the impact of this new prescription within Part 450 is clear: more work for all parties without any improvement to public safety.

At the opposite end of the spectrum, vague requirements are littered throughout Part 450. The best example of this lies within AST's flight safety analysis methods requirement in § 450.115.¹⁵ This regulation generally requires operators to document their analytical approaches with defensible scientific methods. This is certainly reasonable; however, in practice, this requirement is routinely cited by AST as an excuse to request more information from operators, often without end. While the basic tenet cannot be argued, the requirement itself is so open-ended that reasonable technical experts may completely disagree on the extent to which operators must demonstrate compliance. This subjectivity on compliance is unacceptable, and while the spirit of this requirement should remain, AST must work to restructure Part 450 to prevent operators as well as AST analysts from being confused on what is sufficient to meet this requirement.

AST should update Part 450 to remove unnecessary prescription in requirements while also restructuring basic fidelity and accuracy requirements to be executable by operators and AST analysts.

¹² <https://www.ecfr.gov/current/title-14/section-450.131>

¹³ [https://www.ecfr.gov/current/title-14/part-450#p-450.131\(a\)\(1\)](https://www.ecfr.gov/current/title-14/part-450#p-450.131(a)(1))

¹⁴ <https://www.ecfr.gov/current/title-14/section-435.33>

¹⁵ <https://www.ecfr.gov/current/title-14/section-450.115>

III. Conclusion

SpaceX respects and appreciates AST. SpaceX is absolutely committed to ensuring public safety in all operations—Falcon, Dragon, and Starship. We offer these views, and proposed suggestions, in good faith to help enable an *effective* and efficient regulatory regime for commercial space launch and reentry operations. Change is necessary for this to occur. SpaceX thanks the Committee for holding this critically important hearing and shining a light on these very serious challenges. It is clear AST needs help to effectively function and enable the private sector to continue to support the Nation. SpaceX shares AST's commitment to safety, learning, and efficient operation under Part 450 and is looking forward to continued work with AST on this issue.

Thank you again for your attention on this important matter.

Sincerely,

/s/ Mat Dunn

Senior Director, Government Affairs
SpaceX

