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Paper Session III-C - The Commercial Development of Space and the Federal Regulatory Process

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Abstract

The commercial development of space is an important new space frontier. Achieving a robust family of domestic space industries depends on many factors, but it has been said within both government and industry that government's role can be the enabling factor or the show-stopping obstacle.

Federal policy has increasingly emphasized commercial development of space, and the role of government as a venture capitalist or provider of physical resources (such as launch ranges, the Shuttle, and test facilities) has been widely discussed. Less attention has been paid in recent years to the role of government as regulator of space-related industries. This role is critical because it will be the main type of government involvement in commercial space activities in a truly commercial environment of the future.

This paper examines the potential effects on the commercial development of space of federal regulation of space-related industries. It offers the establishment of the Office of Commercial Space Transportation (OCST) as a policy success, in that OCST serves as the "one-stop-shopping" point for commercial launch firms, and examines other areas for federal action to reduce regulatory barriers to industry growth. In particular, it will consider the obstacles to doing business with foreign entities, including limitations on technology transfer, multiple agency authority, and the effect of national foreign policy objectives on business opportunities.

Introduction

The commercial development of space is an important new space frontier. Achieving a robust family of domestic space industries depends on many factors, but it has been said within both government and industry that government's role can be the enabling factor or the show-stopping obstacle.

Federal policy has increasingly emphasized commercial development of space, and the role of government as a venture capitalist or provider of physical resources has been widely discussed. Some well-known and much debated examples are participation by the federal government in on-orbit ventures, as a customer or anchor tenant, and provision of transportation services with delayed repayment provisions or even in exchange for royalties. And, of course, the federal government makes its extensive launch infrastructure available to commercial launch firms on a reimbursable basis. There continues to be an energetic policy debate on the government's role in supporting the development of a commercial space industry.

Less attention has been paid in recent years to the role of government as regulator of space-related industries. This role is critical because it will be the main type of

government involvement in commercial space activities in a truly commercial environment of the future. U.S. policy decisions to date regarding the regulation of the new commercial space industries have been good ones. The creation of a single point of contact for the licensing and safety regulation of the commercial launch industry -- the Department of Transportation's Office of Commercial Space Transportation (OCST) -- was responsive to industry concerns that the requirements for federal permission to conduct commercial launch operations would be costly and unwieldy.

Letting Business Get on With Business: The Office of Commercial Space Transportation

The U.S. Department of Transportation is currently the only agency with specific authority to regulate commercial space transportation activities. Other agencies, such as NASA and the U.S. Air Force, may impose certain requirements on commercial space firms, but these requirements occur in conjunction with the use of the resources of those agencies (such as launch ranges and support services like telemetry and tracking) rather than as the result of a regulatory mandate. In addition, regulatory agencies with general authority over industry (such as the Occupational Safety and Health Administration) of course encompass commercial space firms, but these agencies are not specifically aimed at space.

The Office of Commercial Space Transportation was created in 1984. It was established as a response to a number of needs, but one major concern of industry was the need to enable commercial launch firms to conduct their operations without undue costs of compliance with federal requirements, while still, of course, ensuring the public safety. Congress shared this concern. The House Committee Report on the Commercial Space Launch Act found that:

> "In the absence of this legislation, the mechanism for exercising government control over commercial launch operations is an ad hoc process involving a multitude of agencies, statutes, and regulations, a compilation of which appears in Appendix A [shown here as Figure 1]. At a minimum, a commercial launch operator is required to obtain (1) a license under the Arms Export Control Act from the Department of State, (2) an experimental radio license from the Federal Communications Commission, and (3) an exemption or clearance from the Federal Aviation Agency for use of controlled airspace. *In addition to these, as many as fifteen other licenses or approvals may be required depending on the characteristics of the proposed launch activity.* [Emphasis added.]"[1]

The report went on to say,

> "Thus, the Committee has sought to establish through legislation a single, comprehensive regulatory mechanism for government facilitation and supervision of commercial launch operations."[2]

This mechanism was the Commercial Space Launch Act of 1984, which designates the Department of Transportation as the lead agency for the promotion and control of commercial launch operations.

FEDERAL APPROVAL PROCESS FOR COMMERCIAL SPACE LAUNCHES

Department/agency	Nature of approval	Controlling authority
PRIMARY APPROVALS		
Department of State:		
[Office of Munition Control]	Grants export license—"Licenses for Temporary Export of Unclassified Defense Articles" which addresses national security & foreign policy concerns.	Arms Export Control Act, 22 U.S.C. 2778; ITAR Regs, 22 CFR § 121.01 (Munitions list).
	May set liability insurance to ensure compliance with international treaties. Registers all space objects launched from U.S.	Outer Space Treaty, Article VI, VII Treaty on Principles Governing the Activities of States in Exploration and Use of Outer Space, including Moon & other celestial bodies, Octber 10, 1967 Convention on International Liability for Damage Caused by Space Objects, October 9, 1973 Convention on Registration of Objects launched into Outer Space.
Department of Transportation:		
FAA	Exemption for rocket travel through aerospace (if launched in U.S.). FAA addresses safety aspects & issues approval through Dept. of State, if launched from international waters. Controls airspace, processes request for restricted airspace.	Federal Aviation Act of 1958 (49 U.S.C. § 1341 et. seq.) Federal Aviation Regs. (14 CFR Pts. 1–199).
U.S. Coast Guard	Keeps water traffic within 3 mile limit away from launch sites and trajectory. Assures seaworthiness & security of any vessel carrying rocket to or from launch site.	Ports and Waterways Safety Act (33 U.S.C. 1225) § 6, and 1223(c) § 4c.
Materials Transportation Bureau	Exemptions from regulations for transport of hazardous material (life of exemption—2 years).	Chapter 33, Title 46, USC; 144 U.S.C. 2.
Bureau of Motor Carrier Safety		
Federal Communications Commission	Radio Operations License & Frequency Allocation.	Communications Act of 1934, as amended 47 U.S.C. § 151 et seq./Regs 47 CFR 0–99.
POTENTIAL AUTHORITY/APPROVALS WHICH MAY BE EXERCISED		
NASA	Provides technical advice on vehicle ground, flight safety requirements & may provide equipment. Authority to impose reg. conditions.	National Aeronautics and Space Act of 1958, § 203 (42 U.S.C. 2473).
Department of Commerce	Grants export license, if launch or payload is classified under Commodity Control list (strategic items whose export outside of West is controlled) and is not licensed as "munition" under the ITAR.	Export Administration Act of 1979, as amended (P.L. 96–72); Implementing regulations—15 CFR, Chap. III, Subc. C, parts 368 to 399, inclusive.
Department of Defense	Reviews launch proposals relative to transfer of defense technology	Arms Export Control Act, ITAR, 10 U.S.C. 172 29 CFR Part 1960.
Air Force	Can impose conditions relative to use of KSC and Eastern Space & Missile Center.	DOD–NASA Agreement 1–17–63. DOD Directive 3200.1 (9/29/80).
North American Aerospace Defense Command.	Addresses collision avoidance—passes on suitability of desired orbit. Tracks space objects.	None.
	Initiates communication with Soviet Union if rocket poses threat to USSR.	Treaty.

FIGURE 1 MULTIPLE AGENCY AUTHORITY OVER COMMERCIAL SPACE TRANSPORTATION PRIOR TO THE COMMERCIAL SPACE LAUNCH ACT OF 1984[3]

FEDERAL APPROVAL PROCESS FOR COMMERCIAL SPACE LAUNCHES—Continued

Department/agency	Nature of approval	Controlling authority
Navy	Operates tracking stations. Conducts operations off West Coast.	
Bureau of Alcohol, Tobacco & Firearms	Arms import license, (If explosive devices are imported); Registration of Firearms.	ITAR/relative to importation of arms and munitions into United States. Gun Control Act of 1968 (18 U.S.C. 44)
Internal Revenue Service	Registration and Payment required to import firearms.	Gun Control Act of 1968 (18 U.S.C. 44) Communications Act of 1934, as amended.
Control Intelligence Agency	Ensures consideration of all aspects of national security.	National Security Act of 1947, as amended § 102 (150 U.S.C. 403). Central Intelligence Agency Act of 1949 (50 U.S.C. 403a et. seg.).
Arms Control & Disarmament Agency	Revises launch operation relative to existing arms control agreements and those being negotiated.	Arms Control & Disarmament Act (22 U.S.C. 2551 et. seq.).
Occupational Safety & Health Administration	Develops, enforces employee health and safety standards.	Williams-Steiger Occupational Safety and Health Act of 1970, § 5 (29 U.S.C. 654) and § 6 (29 U.S.C. 655).
Environmental Protection Agency	Regulates handling, treatment, storage and disposal of hazardous substances and wastes.	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund Statute) (40 CFR Subch. J).
	Establishes air and water pollution standards which states enforce on industry.	Resource Conservation and Recovery Act (40 CFR Subch. 1). Clean Air Act (40 CFR, Subch. C, Pts. 52, 53). Clean Water Act (40 CFR, Subch. D, Pt. 123).
	Reviews environmental impact statements. (These may affect launch site selection.)	National Environmental Policy Act—CEQ regs (40 CFR Chapter V).

FIGURE 1 MULTIPLE AGENCY AUTHORITY OVER COMMERCIAL SPACE TRANSPORTATION PRIOR TO THE COMMERCIAL SPACE LAUNCH ACT OF 1984 (Continued)

DOT/OCST continues in its operations to work to address the effects of regulations on its regulated community. For example, OCST is currently developing a new regulation that will provide a much more flexible licensing structure, enabling firms to license ground operations and launch operations separately. The regulation will also, it is expected, have some provisions for the certification of components and vehicle systems outside the licensing process, which should lead to lower costs and greater certainty for a number of affected firms. The purpose of the regulation in development is entirely to provide a more efficient regulatory process from the point of view of the regulated community, with no change in the level of protection the regulatory process affords the public.

Future Regulatory Challenges

Achieving a balance between accommodating business needs and protecting the public interest (assuring the public safety, protecting the environment, preventing unfair financial burdens, and so on) is a challenge in many fields. Emerging space industries pose a very clear example of this challenge, because of the recognized importance of space commerce to the nation's future international competitiveness. The development of a regulatory structure for commercial space activities in the future is also likely to be complicated by the historical dominance of space activities by the federal government, and the continued reliance of commercial firms on infrastructure that is shared among firms and government agencies.

A few examples of specific policy questions that must be addressed with attention to letting business get on with business are below. These examples are intended to demonstrate the importance of structuring effective regulatory approaches to commercial activities in such a way that business opportunities are maximized, within the constraint of protecting the public. These are doing business with foreign entities, anticipating and coping with areas of multiple agency authority, and considering the effect of national foreign policy objectives on business opportunities.

Doing Business With Foreign Entities

At this time, it is difficult to think of any example of the questions inherent in doing business with foreign entities more pressing than those of doing business with the Commonwealth of Independent States. The former Soviet Union invested substantially in space activities, and has developed technology that the U.S. does not have (such as oxygen-rich propulsion technologies). Vehicle systems and components that can meet U.S. mission needs may be available. U.S. firms have visited Russia and other republics to investigate what is available (and who can sell it).

The most important regulatory role for government in this context may be to refrain from acting. Refrain, that is, until there has been time to assess the available options. There is a tendency to assume that buying Soviet-developed technology, components, or even launch systems is counter-competitive. This may in fact be the case, but there may be instances in which such purchases could enhance U.S. competitiveness. For example, buying systems using well-developed Soviet technologies that the U.S. has not pursued may be a very cost-effective method of obtaining that expertise. This could be an arena for federal action; it is an unusual approach to technology transfer, but may be an effective one. Even buying launch vehicles might be done in such a way that the launch

industry could benefit -- for example, if, as has been suggested previously, these components were purchased and used by a consortium which then used the profits from its venture to support vehicle technology R&D.

There is a pressing need for financial and economic analysis of such questions. (To its credit, the Department of Transportation's Commercial Space Transportation Advisory Committee (COMSTAC), an industry advisory group, has undertaken to examine the question of doing business with the former Soviets in aerospace fields.) The political environment has shifted so dramatically in the last two years that decision-making in this area can be grounded in analysis, rather than international politics.

This shift has created an important opportunity for many businesses, and this opportunity should not be abandoned without due consideration.

Multiple Agency Authority

The creation of OCST was, in part, the result of a desire to avoid imposing unnecessary costs on space transportation firms due to duplicative federal requirements. Other commercial space activities may also require attention for this reason. For example, the development of space launch infrastructure by non-federal entities (for example, by states such as Florida, Virginia, and Hawaii, or by private sector organizations) will require coordination among DOT/OCST, state safety and environmental agencies, NASA and the Air Force (to the extent that use of certain of their equipment or expertise is required).

A long-term concern that highlights the issue of multiple agency authority is commercial activity associated with Space Station Freedom. Commercial activities associated with the Space Station could include Station resupply by commercial ELVs, commercial utilization of Space Station resources by industry researchers, or even, in the very long term, privatization of certain Space Station systems and resources. This would require, at a minimum, coordination between NASA (as Station operator) and DOT/OCST (as the agency that licenses commercial ELVs). Commercial activity associated with the Space Station will involve ample technical and financial costs. To increase those costs by requiring unnecessary and duplicative government approval or oversight might seriously hamper the development of commercial activities.

A key element of achieving an approach that facilitates such coordination will be to explicitly recognize the need for a regulatory response. An unstructured, de facto regulatory authority on the parts of a number of federal or state agencies will almost certainly result in high compliance costs and less effective protection of the public. Another important element will be to identify and build on existing agency expertise. For example, NASA will clearly be the premiere resource for Space Station technical information and skills, but as it is currently structured, NASA does not have either the mandate or institutional expertise to act as a regulator per se.

Effect of National Foreign Policy Objectives on Business Opportunities

There are currently many highly charged debates and negotiations on space issues that are affected by national foreign policy objectives -- use of Chinese Long March launch vehicles, the development of "rules of the road" to ensure fair competition with Arianespace, and questions about doing business with the Commonwealth of Independent States. The particular resolution of any of these issues is perhaps less important than whether the process by which they are resolved can be improved.

Uncertainty imposes costs on businesses. Some uncertainty is an inescapable aspect of doing business, and indeed, of daily life. Government actions, however, can be aimed at reducing uncertainty. Principles such as policy consistency and predictability should inform, to the extent feasible, government decision-making. These principles are often in conflict with the reality of a changing world and correspondingly changing foreign policy. Effective regulation in this case can be characterized not as placing requirements on industry, but as imposing a discipline on government to help reduce uncertainty in the face of the changing geopolitical environment. Such discipline may be as simple as making commitments to revisit issues or decisions at a certain time in the future, or may be as broad as developing specific and binding guidelines for decisions on international business issues.

This is admittedly a difficult problem, and one that exists in many industries in addition to commercial space. This paper does not suggest that it can be resolved easily or anywhere near fully. Marginal improvements, however, may be possible, and could have significant benefits.

Conclusions

The recommendations contained in this paper do not specify specific regulatory regimes, but instead concentrate on **process**. Advance planning, attention to reducing the uncertainty of doing business in these areas, avoiding duplication, and embedding flexibility in regulatory approaches may help to enhance the development of commercial space as much as more specific and (let's face it) more exciting types of government support do.

Perhaps the greatest regulatory challenge we as a nation face is to leave behind the persistent view that the public interest is served only when there is an adversarial relationship between business and government. No sensible person is willing to abandon either the objective of protecting the public or that of fostering the economy. Our policy goal for the regulation of commercial space activities should be to identify those instances, small and large, when creativity and forethought can result in better achieving both objectives.

References

1. U.S. House of Representatives, Committee on Science and Technology, "Report to Accompany H.R. 3942." May 31, 1984, p. 15.

2. Ibid., p. 16.

3. Ibid., pp. 21-22.