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ABSTRACT

The opportunity for private sector investment in space technology has increased dramatically in very recent times. The commercialization of this technology places new stresses not only on the technical skills of nations, but also on their legal and political institutions. New technologies such as remote sensing, which are inherently global in their effect, suggest the need for laws and legal institutions which have a similarly global perspective. Yet, the commercialization of space technology remains a high-risk, long-term endeavor. If the private sector is to have a meaningful role in the development of this technology, such laws and regulations must also be sensitive to the realities of the marketplace.

In the past, most space technologies were developed and operated by governments; therefore, limited attention was given to the means to regulate private-sector activities. In the United States, with the exception of satellite communications, the legal and regulatory framework for most commercial space activities is not yet in place.

This paper examines the effect that private-sector remote-sensing activities might have on the international community and on the future of international cooperation in space. It describes in detail "The Land Remote-Sensing Commercialization Act of 1984" recently passed by the U.S. Congress and signed by the President. The paper concludes that it is possible to develop domestic regulations that balance the economic needs of the private sector with the legal and political concerns of the international community.

Introduction

Space technologies, because they involve activities that do not generally respect national boundaries, place new stresses on traditional international legal principles. These principles, based as they are on the rights and powers of territorial sovereignty, often do not supply sufficient direction for the use of new space systems. In order to resolve the complex legal problems that have arisen in the space age, nations, both technologically advanced and developing, have relied on international cooperation. As private firms begin to play a more significant role in space activities, the international coordination of space activities through domestic law and international agreements will continue to be essential to protect common interests and to ensure that special interests are dealt with in a common framework.

Recently, the U.S. Congress passed legislation designed to encourage the development of a private remote-sensing industry.[1] This paper examines this legislation and the means by which it seeks to ensure that private activities are conducted safely and in accord with international legal principles. This paper also discusses the effect that commercial space ventures may have on future international cooperative agreements involving space technology.

Private-Sector Activities and International Law

As the role of private industry varies within each of the nations of the world, and as it is those nations and not their private industries which enter into international space agreements, it is understandable that some confusion exists as to the legal status of private industry in outer space. This discussion will examine some of the legal issues that arise when trying to fit the activities of private enterprise into a framework designed primarily to regulate the actions of states.

In the United States, it has been consistent Government policy to encourage the involvement of private enterprise in its space programs. When President Eisenhower announced his Administration's space policy in 1960, he stated:[2]

> ... (T)o achieve the early establishment of a communication satellite system which can be used **on a commercial basis** is a national objective which will require the concerted capabilities and funds of both Government and **private enterprise** ... I have directed the National Aeronautics and Space Administration ... to advance the needed research and development and **to encourage private enterprise** to apply its resources toward the earliest practical utilization of space technology **for commercial civil communications requirements.** (emphasis added)

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This enthusiasm for private enterprise was not shared by all nations. In 1962, the Soviet Union submitted to the Committee on the Peaceful Uses of Outer Space (COPUOS) a "Draft Declaration of the Basic Principles Governing the Activities of States Pertaining to the Exploration and Use of Outer Space." It was suggested in the draft that, "All activities of any kind pertaining to the exploration of outer space shall be carried out solely and exclusively by States ..."[3] The United States responded to this position by pointing out that pursuant to U.S. policy, as reflected in the Communications Satellite Act of 1962, private firms had already been given the right to engage in space activity. This conflict was resolved by an agreement that states would bear the responsibility for space activities whether such activities were carried out by the state or its nationals.[4] In this manner, private activities could be controlled, albeit indirectly, through international regulation.

The principle of state responsibility for the actions of its nationals is incorporated in both Articles VI and IX of the 1967 Outer Space Treaty.[5] Although the Outer Space Treaty does not specifically grant or deny private industry the right to undertake profit-making activities in outer space, the U.N. debates on this subject make it clear that such activities were contemplated by the drafters.

Given that private enterprise may conduct activities in space for profit if the appropriate state will take responsibility for such actions, it becomes necessary to examine the nature of this responsibility. Some authors, in analyzing Article VI of the Outer Space Treaty, have suggested that a state's responsibilities are extensive:[6]

> ... (W)hile no one would doubt the need for government control over space activity at its present stage, the second sentence of Article VI would prohibit, as a matter of treaty obligation, strictly private, unregulated activity in space or on celestial bodies even at a time when such private activity becomes most common place. Although the terms "authorization" and "continuing supervision" are open to different interpretations, it would appear that Article VI requires a certain minimum of licensing and enforced adherence to government-imposed regulations.

As is discussed below, U.S. adherence to the principles of "authorization" and "continuing supervision" is clearly demonstrated by the remote-sensing legislation recently passed by the U.S. Congress.

In addition to Article VI's general statement of responsibility, Article IX of the Outer Space Treaty requires that if a state or its nationals are going to undertake any activity in space which "would cause potentially harmful interference with activities of other States," then the state planning the activity "shall undertake appropriate international consultation before proceeding with any such activity." Article IX's requirement that the international consultation shall precede the proposed activity is quite significant because it imposes an active duty to regulate rather than a passive duty merely to supervise. Under Article IX, a state has a duty to interfere with or prohibit altogether potentially harmful activities by its nationals at least until such time as the effects of the proposed activity are made known to the international community.

The Outer Space Treaty does not attempt to direct states as to how these responsibilities should be carried out. This is appropriate since a state's control over its nationals involves complex questions of domestic law which are not easily addressed in the context of an international treaty.

One of the more important attempts to delineate the responsibilities of states in outer space was the 1972 "Convention on International Liability for Damage Caused by Space Objects."[7] This Treaty extends the concept of state responsibility to include the concept of liability for damage caused by space objects. Article II of the Liability Treaty establishes the principle that a launching state is absolutely liable for "damage caused by its space object on the surface of the earth or to aircraft in flight."

Two points should be mentioned here. First, the 1972 Liability Convention grants neither rights nor responsibilities to nongovernmental entities. Under Article VIII, if the nationals of a launching state cause damage, it is the state damaged, which "may present to a launching State a claim for compensation." A second point of interest concerning the Liability Convention is the fact that it applies, by its terms, only to "launching States" which are defined in Article I as:

> (i) A State which launches or procures the launching of a space object;
> (ii) A State from whose territory or facility a space object is launched;

Under this scheme, if state A launches a space object for the nationals of state B, both states are considered launching states and have joint liability for damage under Article V of the Liability Convention. This is the case even though under the language of Article IX of the Outer Space Treaty it is state B that bears the international responsibility for the "potentially harmful" activities of its nationals. This problem is somewhat alleviated by Article V of the Liability Convention which allows a state that has paid compensation for damages "to present a claim for indemnification to other participants in the joint launching."

These rather complex international remedies are presently workable only because it is the activities of states and not individuals that predominate in space. As this situation changes, new international legal remedies that more fully comprehend the role of the individual in space activities will have to be developed. These legal remedies will, no doubt, be influenced by

the laws and regulations developed by states to regulate the activities of their nationals.

Regulation of Private Remote-Sensing Activities in the United States

When the first Landsat remote-sensing satellite was launched in July 1972, the U.S. Government owned and operated, through NASA, both the space and ground segments of the system. Since that time there have been four additional Landsat satellites launched. Landsat 5, the current and last satellite in this series, was launched in March 1984.

In 1979, the responsibility for the operation of Landsat was transferred from NASA to the Commerce Department's National Oceanic and Atmospheric Administration (NOAA). NOAA was chosen to operate Landsat, in part, because it already had responsibility for, and experience with, the U.S. meteorological satellites. Though NOAA was given interim operational control of the Landsat program, the ultimate goal of the transfer was to facilitate the transition of both the space and ground segments of the system to the private sector.[8]

Although competition is the normal mode of industrial organization in the United States, regulations are often used to ensure that commercial activities neither jeopardize the health and safety of the general public nor conflict with international obligations. This preference for limited, though essential, regulation is reflected in the recent Congressional legislation related to private remote-sensing activities. This legislation offers a clear example of how the U.S. Government intends to satisfy the "authorization" and "continuing supervision" provision of Article VI of the Outer Space Treaty.

In June 1984, after considerable deliberation, the U.S. Congress passed "The Land Remote-Sensing Commercialization Act of 1984."[9] Two of the primary purposes of the Act were to:[10]

- guide the Federal Government in achieving proper involvement of the private sector by providing a framework for phased commercialization of land remote sensing ...
- maintain the United States' worldwide leadership in civil remote sensing, preserve its national security, and fulfill its international obligations ...

The Act provides for the commercialization of land remote sensing in two distinct phases. During the first phase of the commercialization process, the Secretary of Commerce is directed to contract with a private firm to market data from the current Landsat system. During this phase the U.S. Government, through the Department of Commerce, retains responsibility for the orbit, data collection, and eventual disposition of the satellites and ground systems used to operate the Landsat system. The second phase of the commercialization process is a 6-year transition to a privately owned and controlled land remote-sensing system. In this phase, the Secretary of Commerce is directed to contract for private development, operation, and ownership of a follow-on system to Landsat.

The drafters of this legislation realized that the transfer of remote sensing to the private sector would raise a number of important international legal and policy questions. It is useful to examine some of these questions in order to see how they have been addressed in the legislation.

1) How will the United States ensure private-sector compliance with existing treaties and international agreements to which the United States is a party? Article VI of the Outer Space Treaty makes states responsible for the actions of nongovernmental entities in space and requires the "authorization" and "continuing supervision" of such activities. Article IX of the Outer Space Treaty requires a country to undertake "appropriate international consultations" before it or its nationals commence activities in outer space that may cause harmful interference with the activities of other signatories of the Treaty.

The Remote-Sensing Act recognizes that:[11]

> Government oversight must be maintained to assure that private sector activities are in the national interest and that the international commitments of the United States are honored;

In order to comply with Articles VI and IX of the Outer Space Treaty, the Act requires that remote-sensing operators be licensed by the Secretary of Commerce and grants to the Secretary the power to develop appropriate regulations. Section 401 (b) of the Act states:

> No license shall be granted by the Secretary unless the Secretary determines in writing that the applicant will comply with the requirements of this Act, any regulations issued pursuant to this Act, and any applicable international obligations ...

Section 403 (1) gives the Secretary the authority to "grant, terminate, modify, condition, transfer, or suspend" licenses if the licensee fails to comply with the provisions of the Act. Section 403 (3) gives the Secretary the power to impose penalties, including monetary penalties, for noncompliance with requirements of the license or applicable regulations.[12] On all matters affecting international obligations, the Secretary of Commerce is to consult with the Secretary of State, who is given the responsibility for determining what conditions are essential for meeting these international obligations.[13]

Article VII of the Outer Space Treaty and Article II of the Liability Convention make signatories absolutely liable for space activities which cause damage or injury to the persons or property of other states. The United States will continue to be liable under the provisions of these two treaties when a private firm owns and operates the entire remote-sensing system.

Although the Act does not require the private operator to indemnify the Government in case of accident, section 402 (3) does make the granting of a license dependent on the applicant's willingness, upon termination of operation, "to dispose of any satellites in space in a manner satisfactory to the President." This presumably may alleviate some of the problems associated with space debris or uncontrolled reentry of spacecraft.

The 1974 Convention on the Registration of Objects Launched into Outer Space requires, among other things, that the date, territory of launch, orbital parameters, and function of space objects be registered with the Secretary General of the United Nations. Although the remote-sensing legislation does not specifically mention the Registration Convention, the Senate Report* accompanying this legislation states, "The Committee intends for this responsibility, in the case of land remote-sensing satellites, to be carried out by the Secretary of Commerce."[14]

2) With what data distribution policies will private owners be required to comply? In the past, the United States has followed a policy of nondiscriminatory distribution of unenhanced data. This means that data must be made available to all purchasers under the same terms of sale. Congress was aware that a private operator might find that, in some cases, the value of remotely-sensed data might be increased if purchasers could get exclusive access to this information. For example, oil or other resource management companies might pay a high price for exclusive geological information. However, the Act states instead that, "the broadest and most beneficial use of land remote-sensing data will result from maintaining a policy of nondiscriminatory access to data."[15]

The Senate Report explains this language:[16]

> During the Committee's Landsat hearing, the issue was raised that adherence to the principle of nondiscriminatory access to data was not in the best interest of a commercial entity ... The Committee is sensitive to this issue ... The Committee feels, however, that the benefits from such a commercial enterprise pale in comparison with the benefits to the United States of maintaining allegiance to the principle of nondiscriminatory access to data.

Addressing this same issue, the Report of the House of Representatives notes that continued adherence to the principle of nondiscriminatory access to data is necessary to fulfill the international obligations of the United States.[17] The House report recalls Article I of the Outer Space Treaty which holds that space activities "shall be carried out for the benefit and in the interest of all countries irrespective of their degree of economic or scientific development."

The U.S. Congress also wanted to ensure fairness in the distribution of privately generated remote-sensing data. To this end, section 601 of the Act requires that unenhanced data "be made available to all users on a nondiscriminatory basis" and that "prices, policies, procedures, and other terms and conditions" of data sales be publicly available. Commenting on this section of the legislation, the Senate Report states:[18]

> What the (Committee on Commerce, Science, and Transportation) does not find acceptable is the sale of a single copy of an original scene to the highest bidder. Such an action would transfer the proprietary control of the data from the operator to the purchaser and would be in direct conflict with the principle of nondiscriminatory access to data ...

Commenting on the importance of the requirement to make public information concerning the availability of data and the terms of sale, the House Report observes:[19]

> It is the intent of the (House Committee on Science and Technology) in adopting these provisions to prevent any data purchaser from acquiring proprietary or de facto proprietary control over remote-sensing data. Since de facto proprietary control would result if only one potential data purchaser were aware of a particular service, the Committee intends that all sales policies ... be generally advertised in the user community ...

3) What relationship would a private firm have with foreign governments, particularly those with Landsat receiving stations? At present, foreign ground stations are all owned by local governments; they receive data directly from the Landsat satellites by agreement with the U.S. Government. Some of the agreements which were originally entered into by NASA have recently been renegotiated by NOAA. Under the NASA agreements, foreign ground stations could, for a nominal fee, receive and preprocess these data and sell data products to their own customers if they agreed to abide by the nondiscriminatory sales policy practiced by the United States. The NOAA agreements are essentially the same except that they contain a provision that states they shall remain in effect "for a period of three years ... or until NOAA no longer retains management responsibility for the Landsat system ..."[20] When management responsibility is passed to the private sector, negotiations for new remote-sensing earth stations and the renegotiation of old contracts will be handled by the private-system operator.

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* Reports of the House of Representatives and of the Senate concerning legislation do not have the status of law. They do, however, offer useful guidance into the meaning of specific provisions and of the legislation as a whole.

Congress was aware that "the active participation of the private sector in matters so closely related to diplomatic negotiations is not easily compatible with the culture and protocol of many foreign countries."[21] Therefore, it was the intention of the Remote-Sensing Act to provide a gradual transition between the present period of government-to-government relationships and the future situation in which the private sector will become a negotiating party. To accomplish this, section 201 of the Act states that title to all portions of the current Landsat system will be retained by the United States Government. Section 205 states that the U.S. Government will remain the party of primary responsibility in dealing with foreign governments until the expiration of the existing contracts. The private firm chosen to market the remote-sensing data during the first phase of the transition to commercialization will act as the agent of the U.S. Government. After the termination of existing contracts, the private contractor will be allowed to negotiate new contracts as long as they provide for nondiscriminatory marketing. The House Report on the remote-sensing legislation describes the twofold benefits of this arrangement:[22]

> First, the Government will have the opportunity to observe the performance of a private-sector party in dealing with foreign entities while it maintains substantial oversight responsibilities. Second, foreign governments will have the opportunity to become accustomed to dealing with a private-sector party while maintaining diplomatic relations with the owner and operator of the system (i.e., the United States government). Thus, the plan will provide both data continuity and ease of transition to foreign users.

4) How will the U.S. Government respond to the political and economic concerns that some countries have about remote-sensing activities? The possession of remotely-sensed data and the ability to analyze them have the potential to affect the economic and political interests of other countries. For this reason, some countries feel that their prior consent should be obtained before their territory is sensed. Other nations feel that they should be assured access to data concerning their own resources and that there should be limits placed on the transfer of these data to third parties.

While the U.S. Government operated the Landsat system, it maintained a policy of "open skies" for data acquisition and a policy of nondiscriminatory access for data distribution. In the view of the U.S. Government, the "open skies" policy is supported by Article I of the Outer Space Treaty which states, "Outer Space ... shall be free for exploration and use by all States without discrimination of any kind ..." Similarly, the policy of nondiscriminatory data distribution is supported by Article XI of the Outer Space Treaty which encourages states "to the greatest extent feasible and practicable" to inform the Secretary General of the U.N., the public, and the scientific community of the results of space activities. The "open skies" and "nondiscriminatory distribution" policies will be continued when the remote-sensing system is transferred to the private sector.

Section 607 of the Remote-Sensing Act does, however, introduce some flexibility into these U.S. positions. This section outlines the responsibilities of the Secretaries of State and Defense for identifying relevant international commitments and security concerns and for communicating them to the Secretary of Commerce. These commitments and concerns must be taken into account in any licensing action of the Secretary. The House Report on the remote-sensing bill acknowledges that, "In some cases, these concerns will necessitate that special limitations be imposed on the license."[23] The report notes that potential limitations might include "limitations on resolution or geographical restrictions."[24] Similarly, the Senate Report states that, "private remote-sensing system operators may be required to alter their operations due to unanticipated national security or international concerns."[25] Although the Remote-Sensing Act does not change current U.S. policy with regard to data acquisition and distribution, section 607 does provide a means by which such changes could be instituted.

5) How will the U.S. Government allocate broadcast frequencies for private remote sensing activities? Section 606 of the Remote-Sensing Act requires the President to make available to the private sector frequencies presently reserved for U.S. Government use. This section of the Act also requires that, "The spectrum to be ... made available shall conform to any applicable international radio or wire treaty or convention, or regulation annexed thereto." Within 90 days after the President takes action, the Federal Communication Commission (FCC) is directed to authorize these frequencies for nongovernmental use.

In order to operate the radio facilities necessary for remote-sensing activities, a private operator must file an application with the FCC in accordance with the rules of the Communications Act of 1934.[26] The FCC is also authorized to grant additional frequencies should they be needed for future commercial remote-sensing activities. The Act requires that additional frequency allocations must be in the public interest and consistent with the international obligations of the United States.[27]

Private Sector Space Activities and International Cooperation

Space technology has long provided an example of successful international cooperation; however, as commercial space activities increase, economic competition could begin to limit the opportunities for cooperative activities. A diminution in cooperative activities could adversely effect some developing countries.

In August 1982, the Second U.N. Conference on the Peaceful Uses of Outer Space (UNISPACE '82) met in Vienna, Austria. This conference emphasized the need for the transfer of space technology from developed to developing

appropriate State Party to the Treaty ..."

6. Jasentuliyana and Lee, Manual of Space Law, Vol. 1 (1979), p.17.

7. 24 U.S.T. 2389; T.I.A.S. 7762.

8. Presidential Directive, NSC-54 (November 16, 1979).

9. Remote-Sensing Act, supra, note 1.

10. Id., section 102.

11. Id., section 101 (13).

12. This section states: "(3) (The Secretary may) provide penalities for noncompliance with the requirements of licenses or regulations issued under this title, including civil penalties not to exceed $10,000 (each day of operation in violation of such licenses or regulations constituting a separate violation)."

13. Remote-Sensing Act, supra, section 607.

14. "Land Remote-Sensing Commercialization Act," Senate Report 98-458, Committee On Commerce, Science, and Transportation, 98th Congress, 2nd Session, (May 17, 1984) p. 22.

15. Remote-Sensing Act, supra, section 101 (5).

16. Senate Report, supra, note 14, p. 28.

17. "Land Remote-Sensing Commercialization Act of 1984," House Report 98-647, Committee on Science and Technology, 98th Congress, 2nd Session, (April 3, 1984) p. 11.

18. Senate Report, supra, note 14, pp. 28-29.

19. House Report, supra, note 16, p. 13.

20. Letter from Milton J. Fowler, Acting Comptroller General, to the Honorable James H. Scheuer, Chairman, Subcomm. on Natural Resources, Agriculture Research, and Environment, House of Representatives (July 8, 1983).

21. House Report, supra, note 16. p. 31.

22. Id.

23. Id, p. 32.

24. Id, p. 33.

25. Senate Report, supra, note 14, p. 34.

26. 47 U.S.C. 151 et. seq.

27. Remote-Sensing Act, supra, note 1, section 606 (e).

28. Report on the Second U.N. Conference on the Peaceful Uses of Outer Space, A/CONF. 101/10 (August 1982).

29. Remote Sensing and the Private Sector: Issues for Discussion, (Washington, D.C.: U.S. Congress, Office of Technology Assessment, OTA-TM-ISC-20, March 1984) p. 8.

30. Id.