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ARISING OUT OF HUMAN ACTIVITIES IN OUTER SPACE.

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FOREWORD

*Joanne Irene Gabrynowicz*¹

This volume of the JOURNAL OF SPACE LAW features a special section: *The 50th Anniversary of the National Aeronautics and Space Act*. The year 2008 is the half-century mark for the world's first national space law. On July 29, 1958, less than a year after the successful launch of *Sputnik I*, the National Aeronautics and Space Act of 1958 (NAS Act), also referred to as the Space Act, was passed,² and the United States Congress declared that, "it is the policy of the United States that activities in space should be devoted to peaceful purposes for the benefit of all mankind."³

It was a law the likes of which had never been passed in human history. With humanity's combined space experience totaling only a few years, what was to become the NAS Act had to address every aspect of space activities, some known, most not. The founders of United States and international space law included Paul G. Dembling, who was general counsel to the National Advisory Committee for Aeronautics and later to the National Aeronautics and Space Administration (NASA). Along with Eilene M. Galloway, Glenn Wilson, and others, Mr. Dembling helped create the legislative foundation of NASA and the U.S. civil space program. The JOURNAL OF SPACE LAW is honored to publish Mr. Dembling's first-hand account of how the NAS Act came to be in his article, *The National Aeronautics and Space Act of 1958: Revisited*.

¹ Joanne Irene Gabrynowicz is the Editor-in-Chief of the JOURNAL OF SPACE LAW. She is also a professor of space law and remote sensing law and the Director of the National Center for Remote Sensing, Air, and Space Law at the University of Mississippi School of Law. Prof. Gabrynowicz was the recipient of the 2001 Women in Aerospace Outstanding International Award and is a Director of the International Institute of Space Law and a member of the American Bar Association Forum on Air and Space Law.

² 42 U.S.C 2451 et. seq.

³ *Id.*

Moving forward in time and looking at the present, the NAS Act special section includes articles by three NASA attorneys who, on a day-to-day basis, use the foundation set out by Mr. Dembling and his colleagues. In her article, *50 Years Later: Serving a Space Agency Client – The Lawyer’s Role in International Space Cooperation*, Robin J. Frank addresses the lawyer’s professional role in serving NASA to assist it in implementing U.S. national goals, missions, and policies. NASA attorney David S. Schuman addresses a very special aspect of Mr. Dembling’s work—“other transactions authority”. This is a Congressional grant of authority that is given to NASA in the NAS Act and which, according to Mr. Schuman, has achieved “widespread appreciation [that it is] the most useful among all [of the NAS Act’s provisions, and] [i]t would be no exaggeration to state that since the authority was enacted, NASA lawyers have used this authority...to help our clients achieve their mission tens of thousands of times.”⁴ Mr. Shuman sets out the details of how this is done in his article, *Space Act Agreements: A Practitioner’s Guide*. In *The Extra-Territorial Reach of U.S. Patent Law on Space-Related Activities: Does the “International Shoe” Fit as We Reach for the Stars?*, two other NASA attorneys, Kurt Hammerle and Theodore Ro, discuss the ever-growing and increasingly important aspect of space law that was not even raised at the time the NAS Act was being promulgated. As Mr. Dembling explains, the “original...bills contained no provisions relating to patents...questions of securing rights in invention [were left] to the discretion of the agency operating under the general principles of law...In fact, all of the testimony taken before both Congressional Committees related to bills not having any special patent clauses.”⁵

The year of 2008 has had the 50th anniversary of the world’s oldest national space law and the beginning of new national space law for two major space faring nations: France and Japan. In this volume of the JOURNAL OF SPACE LAW, readers have ac-

⁴ David S. Schuman, *Space Act Agreements: A Practitioner’s Guide*, 34(2) J. SPACE L. 275 (2008).

⁵ Paul G. Dembling, *The National Aeronautics and Space Act of 1958: Revisited*, 34(2) J. SPACE L. 203 (2008).

cess to the first, unofficial English translations of France's Law No. 2008-518 of 3 June 2008 Related to Space Operations and Japan's Fundamental Act of Outer Space (Law No.43, 2008). The French law was translated by Philip Clerc, Head of Legal Department, and Julien Mariez, Legal Advisor, Centre National d' Etudes Spatiales Legal (CNES) Department, Paris, France. Hiroshi Kiyohara, chief attorney, Musashi International Law Office, Tokyo, translated the Japanese law. Finally, regarding national space laws, Parviz Tarikhi, the head of the Microwave Remote Sensing Department at the Mahdasht Satellite Receiving Station in Tehran, Iran, and participant in the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) since 2000, provides unofficial translations of and a comparison between the 2005 and 2008 Statutes of the Iranian Space Agency.

While the last half century has seen the NAS Act develop and adapt, it has been the events of the last eighteen months that have given rise to some of the newest and most important questions in space law. In January 2007, it was reported that a Chinese anti-satellite test was carried out on January 11. On February 21, 2008, the United States shot down *USA-193*, a dysfunctional satellite. In his article, *FY-1C and USA-193 ASAT Intercepts: An Assessment of Legal Obligations under Article 9 of the Outer Space Treaty*, Michael C. Mineiro compares and contrast the two events in legal terms and reaches some conclusions regarding both of them. In a second article relating to on-orbit satellite destruction and space debris, Andrew Brearly takes another look at an earlier relevant event in his article, *Reflections upon the Notion of Liability: The Instances of Kosmos 954 and Space Debris*.

This volume of the JOURNAL OF SPACE LAW is rounded out by three very different, and equally important space law subjects: the U.S. International Traffic in Arms Regulations (ITAR); The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (Rescue Agreement); and antitrust litigation. In their article, *International Space Exploration and Critical Transparency of Basic Research: Impact of the U.S. International Traffic in Arms Regulations*, George S. Robinson and Eric McAdamis address

the legal impact of ITAR on basic research and the scientific community. This paper was written for, and presented at, the 2nd *Eilene M. Galloway Symposium on Critical Space Law Issues* held in Washington, D.C. on December 6, 2007. The National Center for Remote Sensing, Air, and Space Law of the University of Mississippi School of Law, the blog *Res Communis*, and the International Institute of Space Law sponsored the symposium. Prof. Frans G. von der Dunk addresses another significant space law anniversary in his article, *A Sleeping Beauty Awakens: The 1968 Rescue Agreement after Forty Years*. In his case note, *The Privatization of Public Policy: EOSAT v. NASA and the Application of Antitrust Liability to Federally-Supported Monopolies*, third year law student Jason Crook analyzes an important antitrust case of the 1990s that settled out of court but which had major significance to the then commercial remote sensing industry. Like Mr. Crook's previous work, he considers the currently critical issue of the interface between public and private entities that share a goal of profit.

All of these articles, translations, and case note, combined with the JOURNAL OF SPACE LAW'S regular bibliography, *Aviation and Space Law: Relevant Publications*, brings the reader a wide array of new and developing space law from around the world.

CALL FOR PAPERS

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The National Center for Remote Sensing, Air, and Space Law of the University of Mississippi School of Law is delighted to announce that it will publish Volume 35, number 1 of the JOURNAL OF SPACE LAW in the first half of 2009.

Authors are invited to submit manuscripts, and accompanying abstracts, for review and possible publication in the JOURNAL OF SPACE LAW. Submission of manuscripts and abstracts via email is preferred.

Papers addressing all aspects of international and national space law are welcome. Additionally, papers that address the interface between aviation and space law are also welcome.

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To be considered for the next issue, submissions should be received on or before March 15, 2009. The JOURNAL OF SPACE LAW will continue to accept and review submissions on an on-going basis.

ARTICLES

THE NATIONAL AERONAUTICS AND SPACE ACT OF 1958: REVISITED

*Paul G. Dembling**

THE PRELUDE

When the Soviet Union launched the first man-made satellite (*Sputnik*) into space on October 4, 1957, it was a great surprise, shock, and bitter disappointment for those who believed that the United States would be the first to accomplish this feat.

This event led to the creation of a civilian space organization within the United States. It also led to a much more intense competition between the two powers. Consideration should, however, be given to prior events which are relevant.

We start with the activity of the International Council of Scientific Unions (ICSU) in 1952. Based on a suggestion by Lloyd Berkner, a member of the National Academy of Sciences (NAS), ICSU in 1952 started planning for an International Polar Year

designed to study geophysical phenomena in remote reaches of the planet. The Council agreed that July 1, 1957 to December 31, 1958, would be the period of emphasis in polar research... Late in 1952, ICSU expanded the scope of the scientific re-

* Former General Counsel, National Advisory Committee for Aeronautics, former General Counsel, National Aeronautics and Space Administration, former General Counsel, General Accounting Office (now Government Accountability Office), and Partner, Law Firm of Schnader, Harrison, Segal & Lewis. Editor's note: Mr. Dembling was asked to write this paper since he was the author of the NAS Act of 1958.

search effort to include studies that would be conducted using rockets with instrument packages in the upper atmosphere and changed the name to the International Geophysical Year (IGY) to reflect the larger scientific objectives.¹

It was timed to coincide with the high point of the eleven year cycle of sunspot activity. Global activities were planned. In March 1953, NAS created a United States National Committee to oversee the IGY Projects of the United States. In 1954 “the Council adopted another resolution calling for the launch of artificial satellites during the IGY to help map the Earth’s surface. The Soviet Union immediately announced plans to orbit an IGY satellite.”² On July 29, 1955, President Eisenhower announced that the United States planned to launch Earth circling satellites as its part of the IGY. Again in keeping with the President’s decision to distance satellites from the U.S. military program, the scientific satellite Vanguard was chosen. It was planned for launch aboard a modified Viking rocket as a first stage with an Aerobee-Hi as the second stage.

During the days of the Cold War, President Dwight D. Eisenhower called for an “open skies” policy³ and had asked the Soviets to join in this declaration. The Soviets refused claiming it was a U.S. attempt to accumulate target information. President Eisenhower was concerned because the Soviets had acquired the capability to carry atomic bombs on missiles (the first H-bomb dropped from an aircraft). “That event intensified the ‘Cold War’ and affected the President greatly. It focused his attention increasingly on the ramifications of intercontinental nuclear war and the near total absence of reliable intelligence on the U.S.S.R.”⁴ He, therefore, agreed to a U.S. covert surveil-

¹ Roger D. Launius, *Prelude to the Space Age*, in 1 EXPLORING THE UNKNOWN: SELECTED DOCUMENTS IN THE HISTORY OF THE U.S. CIVIL SPACE PROGRAM 21 (John M. Logsdon, NASA-SP-4407 1995). IGY was comprised of scientists from 67 nations who agreed to observe the earth over its whole surface.

² *Id.*

³ For a more detailed discussion of this period, see R. Cargill Hall, *The Origins of U.S. Space Policy: Eisenhower, Open Skies, and Freedom of Space*, in 1 EXPLORING THE UNKNOWN: SELECTED DOCUMENTS IN THE HISTORY OF THE U.S. CIVIL SPACE PROGRAM 213 (John M. Logsdon, NASA-SP-4407 1995).

⁴ R. Cargill Hall, *Sputnik, Eisenhower, and the Formation of the United States Space Program*, 14 (4) QUEST: THE HISTORY OF SPACE FLIGHT 32 (2007).

lance program of the U.S.S.R. but insisted again that it had to be carried out by civilians, not in military aircraft, and not by any military personnel in uniform. Hence, the U2 program was instituted⁵ and the project assigned to be conducted by the Central Intelligence Agency (CIA)⁶ with the high altitude meteorological research program of the National Advisory Committee for Aeronautics (NACA)⁷ as its stated purpose, if and when called upon to explain its existence.

With his own interests focused on national security space applications, President Eisenhower was of a mind to consign all American spacefaring — in which intelligence satellites figured most prominently — to the Department of Defense's ARPA. Killian, supported by Vice President Richard Nixon and others, persuaded the President that scientific satellites would not be supported in that venue, that a civilian space agency was the better choice, and that the National Advisory Committee for Aeronautics (NACA) should serve as the nucleus on which to found it. With the assistance of NACA director Hugh L. Dryden, they assigned the task of drafting legislation for the proposed civilian space agency to NACA's general counsel Paul G. Dembling. His measure, endorsed by Killian and Eisen-

⁵ President Eisenhower approved development of the U-2 on November 24, 1954 and the first U-2 was airborne on August 6, 1955.

⁶ According to Eisenhower's staff secretary, then Colonel Andrew Goodpaster, Eisenhower assigned the U-2 mission to the CIA for three reasons. First, he thought it would be less provocative if a civilian pilot, rather than a military one, flew the aircraft into foreign territory. Second, he wanted the product - the reconnaissance photographs - to be evaluated at the national leadership level, as opposed to being evaluated within the military services. Based on his long years of experience in the military, Eisenhower knew that the military had an incentive to interpret intelligence to its advantage. Finally, he was concerned about not antagonizing the Soviets by pursuing a provocative program in the open. He was concerned that the military would pursue the program in a way that would only escalate tensions between the superpowers.

Dwayne A. Day, *Cover Stories and Hidden Agendas: Early American Space and National Security Policy*, in RECONSIDERING SPUTNIK: FORTY YEARS SINCE THE SOVIET SATELLITE 164 (John M. Logsdon et al. eds., Harwood Academic Publishers 2000).

⁷ 38 Stat. 930 (1915). NASA inherited the U-2 meteorological program from NACA and continued to act as its "front" organization.

hower and submitted to Congress on 2 April 1958, passed essentially as first drawn.⁸

NASA CREATED

The National Aeronautics and Space Act of 1958⁹ created a civilian agency with broad powers to plan and coordinate the efforts of this nation in matters relating to aeronautical and space activities. The Act establishes the basic national policy and the organization to implement this policy. Under this law, exploration of space is a Government program. In declaring the policy and purposes of the Act, the Congress stated that activities in space should be devoted to peaceful purposes for the benefit of all mankind¹⁰ and that general welfare and security of the nation require that adequate provision be made for aeronau-

⁸ See Hall, *supra* note 4, at 37. James R. Killian was President of the Massachusetts Institute of Technology (MIT) when President Eisenhower appointed him to the new White House post, of Special Assistant for Science and Technology - and as such, the first Science Advisor to Presidents. At the time, several departments and agencies sought the nomination to conduct the new space program: NACA, the Atomic Energy Commission, the Army, and the Department of the Air Force. NACA was a logical selection. "It already existed. Its technical personnel were "as occupied with space and missile projects as with aeronautic ones and they had acquired considerable skill in the field," it had a long history of working with the military services and with the aircraft, air engine, and airline industries. JOAN LISA BROMBERG, *NASA AND THE SPACE INDUSTRY* 36 (Johns Hopkins University Press 1999). For background on the drafting of the bill which became the National Aeronautics and Space Act of 1958, see Edward S. Goldstein, Gregory C. LaRosa and David S. Schuman, *Present at the Creation: Paul G. Dembling, Author of NASA's Founding Legislation*, in *NASA: 50 YEARS OF EXPLORATION AND DISCOVERY* 50-53 (Faircount 2008). See also Dembling Archives, available at www.law.gwu.edu/Burns/rarebooks/spcol_Dembling.htm (last visited Oct. 21, 2008).

⁹ 72 Stat. 426, Pub. L. No. 85-568, 85th Congress (1958) (hereinafter Space Act).

¹⁰ See also H.R. 332, 85th Cong (1958). The Resolution expresses the sense of the Congress that the United States should, through international agreement or other appropriate means, seek to ban the use of outer space for military purposes, and provide for joint exploration of outer space, and establish methods to settle disputes which may arise. President Eisenhower, on January 12, 1958, in a letter to Nikolai Bulganin, stated, "I propose that we agree that outer space should be used only for peaceful purposes." Later, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, January 27, 1967 called for the exploration and use of outer space be conducted for peaceful purposes. See Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Jan. 27, 1967, 610 U.N.S.T. 205. See also, Dembling and Arons, *The Evolution of the Outer Space Treaty*, 32 J. AIR L & COM. 419 (1967), and P.G. DEMBLING MANUAL ON SPACE LAW 1, ch.I (Nandasiri Jasentuliyana and Roy S.K. Lee, eds., Oceana Publications 1979).

tical and space activities.¹¹ These activities are made “the responsibility of and are to be directed, by a civilian agency exercising control over aeronautical and space activities sponsored by the United States.”¹²

The Congress declared that the general welfare and security of the United States required that adequate provision be made for aeronautical and space activities. The purposes for which the aeronautical and space activities are to be conducted by the United States include (1) the expansion of human knowledge of phenomena in the atmosphere and space; (2) the development, operation, and improvement of aeronautical and space vehicles; (3) the establishment of long-range studies of the potential benefits to be gained from the opportunities for, and the problems involved in, the utilization of aeronautical and space activities for peaceful and scientific purposes; (4) the making available discoveries of military value to the national defense agencies and for those agencies to make available to NASA, discoveries of value and significance to it; (5) the preservation of this nation as a leader in aeronautical and space science and technology; (6) cooperation with other nations in this work and in the peaceful application of the results; and (7) the most effective utilization of the scientific and engineering resources of the nation.¹³

During the clearance process of the Bureau of the Budget (now Office of Management and Budget)¹⁴ several changes were made to the original draft as submitted by NACA. The most significant change was the insistence of the Department of Defense for a role in outer space activities controlled by the Fed-

¹¹ Space Act, *supra* note 9, § 103 (1) defines “aeronautical and space activities” as “(A) research into, and the solution of, problems of flight within and outside the earth’s atmosphere, (B), the development, construction, testing, and operation for research purposes of aeronautical and space vehicles, and (C) such other activities as may be required for the exploration of space.”

¹² *Id.* § 102(b).

¹³ *Id.* Certain language changed and added over the course of years but the core purposes remain.

¹⁴ The White House’s Budget Office has required federal departments and agencies to submit proposed legislation, among other materials, to it before being forwarded to the Congress. This is in order to assure that the items are in accord with presidential policies and programs.

eral Government. This resulted in the following language that was adopted:

except that activities peculiar to or primarily associated with the development of weapons systems, military operations, or the defense of the United States (including the research and development necessary to make effective provision for the defense of the United States) shall be the responsibility of, and shall be directed by the Department of Defense....¹⁵

NASA FUNCTIONS

My purpose, when drafting the bill, was to assure that the organization would have all authority it would need to perform the functions prescribed or that might be assigned to it. The goal was to make and maintain this nation preeminent in outer space activities.

The civilian National Aeronautics and Space Administration¹⁶ was created by Section 202 of the Act and is headed by an Administrator assisted by a Deputy Administrator. Carrying out President Eisenhower's decision that the nation's space activities should be performed by a civilian organization, this Section provides that the Administrator and the Deputy Administrator shall be appointed from civilian life by the President. Furthermore, the Act prohibited the Administrator and his Deputy from engaging "in any other business, vocation, or employment while serving as such."¹⁷

The Act assimilates into NASA the National Advisory Committee for Aeronautics, the agency which, since its establish-

¹⁵ *Id.*

¹⁶ Eilene Galloway, National Defense Analyst, Library of Congress on detail to Senator Lyndon B. Johnson, then chairman of the Senate Preparedness Investigation Subcommittee of the Senate Armed Services Committee was asked for her advice by Representative John McCormack, the then majority leader of the House of Representatives. She recommended that NASA be an "Administration" instead of an "Agency" and the head of the organization be designated as "Administrator." Her recommendation was accepted by both Houses of the Congress. See Eilene Galloway, *Sputnik and the Creation of NASA: A Personal Perspective*, in *NASA: 50 YEARS OF EXPLORATION AND DISCOVERY* 48 (Faircount 2008).

¹⁷ Space Act, *supra* note 9, § 202(c).

ment by the Congress in 1915,¹⁸ had been the nation's aeronautical research establishment.¹⁹ The Act provides that NACA would cease to exist as of the date the Administrator of NASA announced that his organization was organized and ready to exercise its powers, but not later than 90 days after approval of the Act. Section 301 states that on that date "all functions, powers, duties, and obligations, and all real and personal property, personnel (other than members of the Committee), funds, and records of that organization shall be transferred to the Administration."²⁰

Also, the Act deals with the transfer of other functions. For a period of four years, the President could transfer to NASA "any functions (including powers, duties, activities, facilities, and parts of functions) of any department or agency of the United States, or of any office or organizational entity thereof, which relate primarily to the functions, powers, and duties of the Administration...."²¹ In connection with such transfer, the President may also transfer records, property, civilian personnel, and funds.²²

The Act provides that it shall be the function of NASA to plan, direct, and conduct aeronautical and space activities, to arrange for participation by the scientific community (both in

¹⁸ See *supra* note 7.

¹⁹ NACA's installations were: Langley Research Center, Virginia; Lewis Research Center, Ohio; Ames Research Center, California; Dryden Flight Research Center, California; Wallops Island Flight Facility, Virginia, in addition to the NACA Headquarters in Washington, D.C. On September 30, 1958, NACA personnel totaled 8,000.

²⁰ On October 1, 1958, the Administrator announced that NASA was organized and ready to exercise its powers. Space Act, *supra* note 9, § 301(a).

²¹ *Id.* § 302.

²² Under this provision, the President issued Executive Order 10783 October 1, 1958 transferring from the Department of Defense responsibility for non-military space projects such as lunar probes and scientific satellites. The Order also transferred Project Vanguard, the United States Scientific Satellite Program which had been the Navy's responsibility. Executive Order 10793, promulgated on December 3, 1958, transferred from the Department of the Army the Government-owned facilities of the Jet Propulsion Laboratory of the California Institute of Technology. Under this authority Wernher Von Braun and his cadre of personnel of the Army Ballistic Agency were also transferred to NASA. As negotiator for NASA, this transfer was the most difficult. My position was that the Von Braun team, their special pay grades, and all their work were to be transferred. The Army rejected this view and we found ourselves before the Attorney General to decide whether a "transfer" was the same as a reorganization (my position). The Attorney General ruled that it was.

the United States and abroad) in certain of such activities, and to provide wide dissemination of information concerning such activities.²³

In the performance of its functions, the Administration is authorized the following²⁴ (It should be noted that the functions, powers, duties, obligations, are provided to the “Administration” rather than to the head of the organization as is usually the legislative method for organic agency organizations. I drafted it in this fashion in order to avoid the continuing problem of determining whether a function given to the head of an organization is delegable):

- to make, promulgate, issue, rescind, and amend rules and regulations governing its operations and the powers vested in it.
- to appoint and fix the compensation of officers and employees needed to carry out its functions. [The Civil Service Commission (now the Office of Personnel Management) insisted that this authority be limited to a fixed number of senior personnel and all other personnel shall be appointed and compensated in accordance with civil service laws.]
- to acquire, use, and dispose of property and facilities. [The General Services Administration insisted that the disposal of property must be in accordance with the Federal Property and Administrative Services Act of 1949, as amended (40 U.S.C. 471 et req.)]
- to accept unconditional gifts of services or property. (During the Senate hearing, Senator Clinton Anderson strongly recommended the inclusion of the word “unconditional.”)
- “to enter into and perform such contracts, leases, cooperative agreements, or other transactions as may be necessary in the conduct of its work and on such terms as it may deem appropriate...” with any governmental and non-governmental entity.

²³ Space Act, *supra* note 9, § 203 (a).

²⁴ *Id.* § 203 (b).

- While it is common for Federal departments and agencies in their organic or authorizing statutes to be provided authority to enter into contracts, leases, and cooperative agreements, I wanted to assure that the organization met any contingency that might arise, and so I added the language for “other transactions.” The Space Act, for the first time, authorized an agency, NASA, to enter into “other transactions.” This authority is without limitation. Since such a transaction is not a procurement agreement, it is not subject to the laws, regulations, and other requirements applicable to contracts, leases, cooperative agreements. It is this flexibility which provides authority to structure agreements in accordance with standard business practices.²⁵

The Act also provides that contracts shall be allocated in a manner to enable small business to participate equitably and proportionately in the work of NASA,

- to use facilities and other resources of Federal and other agencies, and to cooperate on a similar basis with such agencies (“Each department and agency of the Federal Government shall cooperate fully with Administration in making its services, equipment, personnel, and facilities available to the Administration; and any such department or agency is authorized, notwithstanding any other provision of law, to transfer or to receive from the Administration” vehicles, supplies, and equipment²⁶;
- to appoint advisory committees;
- to establish procedures for coordinating activities with related activities by other public and private organizations;
- to employ experts and consultants;
- to employ aliens when determined by the Administrator to be necessary;
- to employ retired commissioned officers of the Armed Forces;

²⁵ For a detailed account of NASA’s use of this authority, see David S. Schuman, *Space Act Agreements: A Practitioner’s Guide*, 34(2) J.SPACE L. 277 (2008).

²⁶ Space Act, *supra* note 9, § 203(b)(6).

- to enter cooperative agreements by which members of the Armed Forces may be detailed for duty in NASA to the same extent as they might be assigned in the Department of Defense; and
- to settle and pay claims against the United States for injury or death resulting from activities of the Administration, within certain monetary limits.

SCIENTIFIC OR TECHNICAL CONTRIBUTIONS

Section 306 authorized the Administrator to make monetary awards for scientific or technical contributions which are determined to have significant value in the conduct of aeronautical and space activities. Each proposal for award shall be referred to the Inventions and Contributions Board for hearing and the Board shall transmit to the Administrator its recommendation as to the terms of the award, if any. The Administrator, in determining the terms and conditions of any award shall consider the value of the contribution to the United States; the total amount that had been expended in developing the contribution; and the amount of compensation previously received by the contributor (other than salary received for services rendered as an officer or employee of the United States Government).

NATIONAL AERONAUTICS AND SPACE COUNCIL

The bill that was sent to the Congress by President Eisenhower did not contain a provision for a National Aeronautics and Space Council. When the bill came to the Senate Special Committee on Space and Astronautics chaired by Senator Lyndon B. Johnson, the Majority Leader, he proposed a National Aeronautics and Space Council²⁷ using the National Security Council as its model. He also envisioned the two councils would have equivalent status. It was a presidential-level policy board.

It was composed of the President (who shall preside over meetings of the Council); the Secretary of State; the Secretary of Defense; the Administrator of the NASA; the Chairman of the

²⁷ This became § 201 of the Space Act. See Space Act, *supra* note 9, § 201.

Atomic Energy Commission; not more than one additional member appointed by the President; from the departments and agencies of the Federal Government; and not more than three other members appointed by the President; solely on the basis of established records of distinguished achievement from among individuals in private life who are eminent in science, engineering, technology, education, administration, or public affairs.²⁸

All the members of the Council were required to be appointed “with the advice and consent of the Congress” unless already serving in a position which required such action by the Senate. The functions of the Council were to

survey all significant aeronautical and space activities, including the policies, plans, programs, and accomplishments of all agencies of the United States engaged in such activities; develop a comprehensive program of aeronautical and space activities to be conducted by agencies of the United States; designate and fix responsibility for the direction of major aeronautical and space activities; [and to] provide for effective cooperation between the National Aeronautics and Space Administration and the Department of Defense in all such activities.²⁹

and specify which of such activities would be assigned to each or both of these organizations. This Section of the Act specified the duties of the President to include surveying of all significant aeronautical and space activities, develop a comprehensive program, designate and fix responsibility for the direction of major aeronautical and space activities, to provide for effective cooperation between NASA and the Department of Defense, and if there were differences among the departments and agencies, the President would resolve such differences including “whether a particular project is an aeronautical and space activity.”³⁰

When Senate Majority Leader Lyndon B. Johnson was elected Vice President, he asked that, in view of his background and interest in space activities, the Vice President be named Chairman of the National Aeronautics and Space Council. Legis-

²⁸ *Id.* § 201(a).

²⁹ *Id.* § 201 (e)(1)-(4).

³⁰ *Id.* § 201 (e)(5).

lation was enacted to reflect that change. President John F. Kennedy and Administrator James E. Webb, however, were concerned that in that position, the Vice President would engulf NASA. The President and the NASA Administrator discussed how to limit the ability of the Space Council Chairman to do so. Administrator Webb suggested, and the President agreed, that the President would issue a rule that stated that the Council could consider only the agenda established by the President. Limited in this fashion, the Council was relegated to minor matters. As a result, the National Aeronautics and Space Council was finally abolished together with its functions effective July 1, 1973.³¹

CIVILIAN-MILITARY LIAISON COMMITTEE

A review of the hearings indicates emphasis on securing cooperation and coordination of aeronautical and space activities between the military departments and the new agency.³² For these purposes, the Act provided for a Civilian-Military Liaison Committee headed by a Chairman appointed by the President and composed of an equal number of representatives from both the military departments and from NASA.³³ NASA and the Department of Defense, acting through the Liaison Committee, would advise and consult with each other on all matters within their jurisdictions having to do with aeronautical and space activities, keep each other fully and currently informed on these activities, and strive to reach agreement on differences which might arise in this area between the two agencies. If the Secretary of Defense and the Administrator fail to reach agreement on any difference, then either official may refer the matter to the President for final decision. The Act also provided that the NASA Administrator and the Secretary of Defense may seek

³¹ Reorganization Plan No.1 of 1973 §3(4) represented as 87 Stat. 1089, 1090, transmitted Jan. 26, 1973, 38 Fed. Reg. 9579 (Apr. 18, 1973).

³² H.R. 11881 before the House Select Committee on Astronautics and Space Exploration and Hearings before the Senate Special Committee on Space and Astronautics, 85th Cong, 2d Sess (1959).

³³ Space Act, *supra* note 9, § 204 (a). This Section provides for the Committee to be composed of one or more representatives from the Department of Defense, and one or more representatives from each of the Departments of the Army, Navy, and Air Force, and an equal number from NASA.

solutions to questions of jurisdiction either directly or through the Liaison Committee and to hold to a minimum the questions referred to the President and the Space Council.

“Historian Robert MacGregor points to the parallels between the Atomic Energy Commission and NASA and further argues that NASA’s rise in the 1960’s as an engine of American International prestige was rooted in atomic diplomacy and that certain debates in Congress about the new agency were largely approached from within a framework of atomic energy....”³⁴ This is borne out. House Majority Leader John McCormack, as Chairman of the Select Committee on Astronautics and Space Exploration considering the bill, urged the adoption of a Civilian-Military Liaison Committee. He based his argument on the fact that space was the new hostile environment confronting the nation, similar to atomic energy, a few years previously. When he, and the Congress, were considering the bill which became the Atomic Energy Act of 1954, his approach, then, as with the Space Act, was to provide for such a Committee.³⁵

INTELLECTUAL PROPERTY

The original Administration bills³⁶ contained no provisions relating to patents, leaving the questions of securing rights in invention to the discretion of the agency operating under the general principles of law and regulations adopted by each agency. There was no discussion in the Congressional hearings of the patent provisions as they were enacted into law. In fact, all of the testimony taken before both Congressional Committees related to bills not having any special patent clauses.³⁷

³⁴ Steven J. Dick, *From the Chief Historian*, 25 NEWS & NOTES 5 (May 2008).

³⁵ The Civilian-Military Liaison Committee together with its functions was abolished, effective, July 27, 1965, by Reorganization Plan No. 4 of 1965, §1(e), 30 Fed. Reg. 9353 (1965), reprinted in 79 Stat. 1321.

³⁶ H.R. 11811, S. 3609, 85th Cong (1958).

³⁷ During the Senate Hearings, Senator Anderson queried Deputy Secretary of Defense Donald A. Quarles on the absence of any patent provisions in the Administration bill. Mr. Quarles replied that it had been assumed in the Department of Defense that the new agency would utilize “the same kind of patent provisions that our own work carries with it.” In a statement furnished for the record Mr. Quarles elaborated on this point. The statement outlined the broad policy of the Department of Defense of taking only license rights under research and development contracts and indicated that NACA policies and

The result of discussions among the members of the House and the Senate Committees and between the leaders of both Committees, was that special patent provisions were needed. The Administration bill was replaced in the House by a new bill H.R. 12575, which contained provisions related to patent rights,³⁸ Senate 3609, as amended and reported out by the Senate's Special Committee, contained patent provisions similar to those contained in H.R. 12575; these were eliminated from the bill on the Senate floor in order to permit further consideration of the problem in conference.³⁹ In conference, the staff members were assigned to draft appropriate patent provisions. These were rewritten and expanded, using the Atomic Energy Act provisions as a model. Therefore, they differ greatly from those followed by most of the other Federal departments and agencies.

The Space Act provides that inventions which are made in performance of work under NASA contracts shall become the exclusive property of the United States whenever the Administrator determines that (1) the person who made the invention was employed or assigned to perform research and development or exploratory work and the invention is related to such work or was within the scope of his employment duties, whether or not the invention was made during working hours or with a contribution of Government funds or facilities or the services of Government employees during working hours; or (2) the person who made the invention was not so employed or assigned but the invention is nevertheless related to the contract or to the work or duties he was employed or assigned to perform and was made during work-

procedures were similar to those of the Defense Department. The statement concludes that since these policies and procedures had provided the Defense Department with an adequate basis for handling patent matters there was no need for special patent provisions in the proposed legislation. The patent policies of the Department of Defense are located in the DoD Supplement to the Federal Acquisition Regulation (FAR) at title 48, Chapter 2, Part 227 of the Defense Acquisition Regulation System.

³⁸ H.R. 12575 § 507, 85th Cong. (1958), vested title in the Government to inventions made under NASA contacts unless the Administrator waived such rights. In the event of waiver, the Administrator was to retain the full right to the use of the invention or discovery and to license others to use it in carrying out NASA's functions under the Act, for which the Administrator was authorized to pay reasonable royalty fees. Where the agency's claim was not waived, the Administrator was authorized to pay the inventor a cash award.

³⁹ Cong. Rec. 10233 (daily ed. June 16, 1958).

hours or with Government contributions. Since 1980, rights in inventions made by businesses, colleges, universities, and non-profit organizations in performance of federal funding agreements (contracts, grants, and cooperative agreements) have been subject to the provisions of the Bayh-Doyle Act as amended Pub. L. No. 96-517, 1980, 35 U.S.C. 200 et. seq.)⁴⁰ The Administrator may waive title to any invention or class of inventions made by any person or class of persons in the performance of any work under any NASA contract if the Administrator determines that waiver would serve the interests of the United States and upon such terms and conditions which will protect the United States' interests. While the Administrator may waive title, the Government must retain, under the provisions of the Act an irrevocable, nontransferable, royalty free license for the practice of such invention throughout the world by or on behalf of the United States or any foreign government pursuant to any treaty or agreement with the United States.

The Congress mandated the establishment of an Inventions and Contributions Board. One of its functions is to consider each proposal for any waiver. "Such Board shall accord to each interested party an opportunity for hearing, and shall transmit to the Administrator its findings of fact with respect to such proposal and its recommendations for actions to be taken with respect thereto."⁴¹

The Act also provides that "No patent may be issued to any applicant other than the Administrator for any invention which appears to the Commissioner of Patents⁴² to have significant utility in the conduct of aeronautical and space activities...."⁴³ Procedurally, no patent shall be issued for such an invention unless the applicant furnishes the Commission within 30 days of his application a sworn statement setting forth the full facts concerning the circumstances under which such invention was made and stating the relationship (if any) of such invention to

⁴⁰ Space Act, *supra* note 9, § 305 (a)(1)-(2).

⁴¹ Space Act, *supra* note 9, § 305(f). Section 305(a) now applies only to large business.

⁴² Pursuant to Section 3 of Pub. L. No.93-596, 88 Stat. 1949 (Jan. 2, 1975), the "Commissioner of Patents" means "Commissioner of Patents and Trademarks."

⁴³ Space Act, *supra* note 9, § 305(c).

the performance of any work under any NASA contract. This statement is furnished to the Administrator who may, within 90 days, request that the patent be issued to him on behalf of the United States.

The provision has led some to hold that the Act permits the Administrator to take ownership to *any* invention which has significant utility in the conduct of aeronautical and space activities.⁴⁴ It appears to this writer that this subsection should be read in conjunction with the preceding subsections 305(a) and (b). Thus read, the Administrator could take title only when there was a contractual relationship with the NASA. The conference report appears to support this interpretation since it discusses subsections 305(c) and (d) as providing a means for determining "any controversy with respect to the validity of the Administrator's claim of title to any invention."⁴⁵ If the Administrator requested title to be vested in the United States regardless of any contractual relationship to NASA, it was not clear from Section 305 whether the Commissioner of Patents could do so.

The Act also provides for notice to the applicant and a hearing before the Board of Patent Interferences and determination by the Board, subject to appeal to the Court of Customs and Patent Appeals. The Administrator may during a five-year period challenge any applicant's statement as containing a false representation of material fact and request transfer of title to the patent to him. Such transfer will take place unless within 30 days after receipt of notice by the patent owner he requests a hearing before the Board of Patent Interferences.

INTERNATIONAL COOPERATION

Section 205 provides that NASA, "under the foreign policy guidance of the President, may engage in a program of interna-

⁴⁴ Wilson R. Malthy in his article on the patent provisions of the National Aeronautics and Space Act of 1958 states: "In the new Act the control by the Administrator is not limited to situations of financial support or use of Administration equipment and facilities, and the restrictive provisions become applicable merely upon a finding of significant utility in aeronautical and space activities." Wilson R. Mathy, *The National Aeronautics and Space Act of 1958 Patent Provisions*, 27 GEO. WASH. L. REV. 45 (1958).

⁴⁵ CONFERENCE REPORT - STATEMENT OF THE MANAGERS ON THE PART OF THE HOUSE. H.R. REP. NO. 2166, 85th Cong., 2d Sess. 23 (1958).

tional cooperation in work done pursuant to the Act, and in the peaceful application of the results thereof, pursuant to agreements made by the President with the advice and consent of the Senate.” This language is the result of the objection that the Department of State had with the open-ended authority sought for the new organization. Even though this represented the agreed upon provision by the Executive and Legislative Branches, President Eisenhower felt it necessary, on July 29, 1958 upon signing the Act to single it out and make the following statement regarding Section 205: “I regard this section merely as recognizing that international treaties may be made in this field, and as not precluding, in appropriate cases, less formal arrangements for cooperation. To construe the section otherwise would raise substantial constitutional questions.” Thus, Section 205 of the Act provided the legislative basis for establishing a long-range and continuing program in the field of international cooperation.

ACCESS TO INFORMATION

Section 303 provided that information obtained or developed by NASA shall be made available for public inspection, except if (a) protected by Federal Statute or (b) classified to protect national security. This provision, strongly recommended by Congressman John E. Moss, was the precursor of the Freedom of Information Act.⁴⁶

SECURITY

Section 304 authorized the Administrator to “establish such security requirements, restrictions, and safeguards as he deems necessary in the interest of national security.”

⁴⁶ 5 U.S.C. §552. The Act was signed into law by President Lyndon B. Johnson on July 4, 1966. The Act defines agency records subject to disclosure and outlines mandatory disclosure procedures. It also allows for the full or partial disclosure of previously unreleased information and documents controlled by the U.S. Government. Congressman Moss championed the Freedom of Information Act, which he authored, through multiple sessions of the House of Representatives, where he served from 1953 to 1978.

It also authorized the Atomic Energy Commission to grant access to Restricted Data relating to aeronautical and space activities to NASA employees, contractors, or licensees when necessary in the performance of their duties.

REPORTS TO THE CONGRESS

Section 206 provided for NASA to submit “to the President for transmittal to the Congress” at least semi-annually, “a report of its activities and accomplishments.” The Section also requires the President to report to Congress each January describing “the activities and accomplishments of all agencies of the United States” engaged in aeronautics and space activities during the preceding calendar year and to evaluate these against the requirements of Section 102(e), which states that the aeronautical and space activities of the United States shall be conducted so as to contribute materially to one or more of the objectives set forth in the Act.

IN RETROSPECT

Fifty years ago the Space Act created

a new federal agency... to accomplish feats of exploration and discovery unparalleled in human history. The men and women of NASA have been responsible for such epic achievements as landing twelve human explorers on the moon, sending robots to scout the solar system from Mercury to Pluto, and making revolutionary discoveries about the nature of our universe. Closer to home, people have reaped enormous benefits from NASA’s communications, weather, and Earth monitoring satellites, and the agency’s continued commitment to excellence in aeronautics research. Our quality of life has been improved by thousands of new technologies derived from NASA research...NASA’s past is only the prelude to an adventure truly without end.⁴⁷

Looking back on this 50-year record, I am extremely pleased to have been able to make a contribution to these efforts.

⁴⁷ Michael D. Griffin, *Message from the NASA Administrator, in NASA: 50 YEARS OF EXPLORATION AND DISCOVERY 16* (Faircount 2008).

50 YEARS LATER: SERVING A SPACE AGENCY CLIENT – THE LAWYER’S ROLE IN INTERNATIONAL SPACE COOPERATION

*Robin J. Frank**

Last fall, I participated in the 2nd Eilene M. Galloway Symposium on Critical Issues in Space Law (December 6, 2007) by speaking on the topic of “Serving the Space Agency and other Space Clients: Achieving Effective International Cooperation Through Legal Advice.” Several participants found my presentation interesting and thought the subject would be of interest to a broader audience. Thus, I have elaborated on the topics of that presentation and put them in the broad context of international law practice at the National Aeronautics and Space Administration (NASA) in this Article.

Lawyers at NASA provide legal advice and services on a broad variety of subjects, ranging from contracts and procurement to personnel, ethics, intellectual property, and commercial law. The lawyers in the International Law Practice Group (ILPG) are responsible for providing legal advice in direct support of NASA’s international programs. The legal advice covers, among other issues, drafting and negotiating international agreements regarding international space operations, exploration, science and aeronautics cooperation, legal issues that arise in implementation of these agreements, space law, domestic laws that implicate foreign involvement in NASA activities, counter-intelligence, and export control.

* Senior Counsel, Office of General Counsel, National Aeronautics and Space Administration. The views expressed herein are solely those of the author and do not necessarily represent those of the National Aeronautics and Space Administration [hereinafter NASA]. The author would like to thank Michael C. Wholley, General Counsel, E. Jason Steptoe, Associate General Counsel, and other colleagues in the Office of General Counsel and Office of External Relations, NASA, for their review of and helpful comments on drafts of this Article. Any errors are the responsibility of the author.

The ILPG — in conjunction with other Headquarters legal practice groups and chief counsel offices at NASA field centers — supports the General Counsel in providing the Administrator and NASA programs, the Office of External Relations, Mission Directorates, and Centers with advice and counsel on international legal issues affecting the Agency. We advise the different components of NASA as to what the relevant law provides and help them to resolve all competing interests before proceeding with international programs. In effect, we provide tactical and strategic advice on how NASA moves forward in these areas.

To illustrate this process, this article discusses the provision of legal advice and counsel in two specific program areas of great importance to NASA's mission, each of which is at very different stages of development. First, the article focuses on space cooperation with Russia in the mature context of the *International Space Station (ISS)* program. Second, it examines briefly the evolving multilateral dimensions of the U.S. Space Exploration Policy.

I. COOPERATION WITH RUSSIA ON THE INTERNATIONAL SPACE STATION

Over the past few years, NASA and the International Partners have been concerned with final assembly and use of the ISS. The situation is legally mature. The United States, Japan, Canada, Russia, and Member States of the European Space Agency entered into the Agreement Among the Government of Canada, Governments of Member States of the European Space Agency, the Government of the Russian Federation and the Government of the United States of America Concerning Cooperation on the Civil International Space Station, signed at Washington, January 29, 1998 (Intergovernmental Agreement or IGA)¹ that provides the framework for cooperation. Moreover, the United States entered into Memoranda of Understand-

¹ Agreement Among the Government of Canada, Governments of the Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation and the Government of the United States of America Concerning Cooperation on the Civil International Space Station, Jan. 29, 1998 [hereinafter IGA], available at <ftp://ftp.hq.nasa.gov/pub/pao/reports/1998/IGA.html>.

ing (MOU) concerning cooperation on the International Space Station (ISS) with the Canadian Space Agency (signed January 29, 1998), the European Space Agency (signed January 29, 1998), the Russian Federal Space Agency (Roscosmos or RSA) (signed January 29, 1998) and the Government of Japan (signed February 24, 1998).² Attorneys from the predecessor office to the ILPG were members of the United States Government delegation that negotiated the IGA and the NASA team that negotiated the MOUs. These agreements establish an array of governing boards that address a wide variety of assembly and operational issues and make various decisions on cooperation. The ILPG — often in consultation with the Department of State's Office of the Legal Adviser and/or the Johnson Space Center's (JSC) Office of Chief Counsel and, at times, in coordination with the International Partners' counsel — provides legal advice about the IGA, MOUs, Implementing Arrangements, and occasionally addresses legal questions that arise in the work of the governing boards.

This Section addresses, in particular, the legal framework, below the level of the NASA-Russian Federal Space Agency Memorandum of Understanding, that governs the relationship between the two space agencies and at the manner in which a U.S. nonproliferation statute has affected this relationship.

² Memorandum of Understanding Between the National Aeronautics and Space Administration of the United States of America and the Canadian Space Agency Concerning Cooperation on the Civil International Space Station, Jan. 29, 1998, *available at* ftp://ftp.hq.nasa.gov/pub/pao/reports/1998/nasa_csa.html. Memorandum of Understanding Between the National Aeronautics and Space Administration of the United States of America and the European Space Agency Concerning Cooperation on the Civil International Space Station, Jan. 29, 1998, *available at* ftp://ftp.hq.nasa.gov/pub/pao/reports/1998/nasa_esa.html. Memorandum of Understanding Between the National Aeronautics and Space Administration of the United States of America and the Russian Space Agency Concerning Cooperation on the Civil International Space Station, Jan. 29, 1998 [hereinafter NASA-Roscosmos MOU] *available at* ftp://ftp.hq.nasa.gov/pub/pao/reports/1998/nasa_russian.html. Memorandum of Understanding Between the National Aeronautics and Space Administration of the United States of America and the Government of Japan Concerning Cooperation on the Civil International Space Station, Feb. 24, 1998, *available at* ftp://ftp.hq.nasa.gov/pub/pao/reports/1998/nasa_japan.html.

A. 1990s – 2005

The Protocol Including Terms, Conditions and Assumptions, Summary Balance of Contributions and Obligations to International Space Station (ISS) and Resulting Rights of NASA and RSA to ISS Utilization Accommodations and Resources, and Flight Opportunities³ (Balance Agreement) was concluded in 1996. While the Balance Agreement predates the IGA and the NASA-Roscosmos MOU, by its terms it became an implementing arrangement⁴ under those agreements. Its basic premise — and this understanding carries over to present day relations between Russia and the other ISS Partners — is that the ISS is made up of two segments, the Russian Segment and the U.S. on-orbit segment (USOS).⁵ Each side retains the use and benefits of the elements it provides (*e.g.*, launch of elements, share of crew, crew supplies, life support consumables, spares and payloads) and is responsible for support of its own elements (“keep what they bring”), unless otherwise provided for in the Balance Agreement.⁶ The Balance Agreement addresses provisions of goods and services on a comparable basis (“balanced” basis) that cross the interface between the Russian Segment and the USOS. In the Balance Agreement, NASA and Roscosmos agree to mutual provision of goods and services covering the life of the ISS Program, without exchange of funds. The Balance Agreement (recognizing that these issues would also be addressed in the NASA-Roscosmos MOU), addresses such issues as flight opportunities and crew time, crew rotation and rescue, propellant delivery, the status of a Russian-built U.S. component of the ISS, the Functional Cargo Block (FCB, also known as

³ The Protocol Including Terms, Conditions and Assumptions, Summary Balance of Contributions and Obligations to International Space Station (ISS) and Resulting Rights of NASA and RSA to ISS Utilization Accommodations and Resources, and Flight Opportunities (June 11, 1996) [hereinafter Balance Agreement] (on file with author).

⁴ The IGA provides that Cooperating Agencies (here, NASA and Roscosmos) may enter into arrangements to implement the MOUs – “implementing arrangements.” See 1988 IGA, *supra* note 1, at art. 4. The MOUs are subject to the IGA and the implementing arrangements are consistent with and subject to the MOUs.

⁵ Balance Agreement, *supra* note 3, at para. 1.

⁶ *Id.* at para. 4.

Zarya), and NASA's launch of the originally envisioned Russian Science Power Platform.⁷

NASA also has a contract with Roscosmos dating back to *Shuttle-Mir* cooperation (since 1993). The terms of the contract provide, *inter alia*, for NASA to pay Roscosmos for the provision of certain goods and services that NASA is responsible for providing to the Partnership under the IGA and MOUs.⁸

Since the original Balance Agreement and NASA-Roscosmos contract were concluded, many things have changed. First, Russia's severe financial difficulties in the 1990s, coupled with engineering challenges on the U.S. side, resulted in significant delays in the early assembly of the *ISS*. Second, the Iran Nonproliferation Act (INA) was enacted in 2000. The INA prohibited payments, in cash or in kind, related to the *International Space Station* by the United States Government (and its contractors) to Roscosmos and many other Russian entities, except for payments required to be made under the terms of contracts and agreements in effect on January 1, 1999.⁹ Third, the

⁷ *Id.* at paras. 11, 13, 14, 17, 19, & 20.

⁸ Contract NAS15-10110.

⁹ Iran Nonproliferation Act of 2000, Pub. L. No. 106-178, 114 Stat. 38, 50 U.S.C. § 1701 (Jan. 4, 2000), at note [hereinafter INA].

INA provides in relevant part:

SEC. 6. RESTRICTION ON EXTRAORDINARY PAYMENTS IN CONNECTION WITH THE INTERNATIONAL SPACE STATION.

(a) Restriction on Extraordinary Payments in Connection With the International Space Station.—Notwithstanding any other provision of law, no agency of the United States Government may make extraordinary payments in connection with the International Space Station to the Russian Aviation and Space Agency, any organization or entity under the jurisdiction or control of the Russian Aviation and Space Agency, or any other organization, entity, or element of the Government of the Russian Federation, unless, during the fiscal year in which the extraordinary payments in connection with the International Space Station are to be made, the President has made the [nonproliferation] determination described in subsection (b), and reported such determination to the [appropriate Congressional Committees]....

Id. at § 6.

SEC. 7. DEFINITIONS.

For purposes of this Act, the following terms have the following meanings:

- (1) Extraordinary payments in connection with the international space station.—The term 'extraordinary payments in connection with the Inter-

grounding of the *Space Shuttle* fleet following the *Space Shuttle Columbia* tragedy further delayed completion of the *ISS* Assembly. Fourth, both sides changed their planned contributions, thus affecting the end-state configuration of the *ISS*.

The Addendum to the 1996 Balance of Contributions Protocol for Services to be Provided through December 2005 and Crew Rescue through April 2006 (First Addendum)¹⁰ was negotiated in 2004 and entered into force in January 2005. It was intended to be an interim step in an update process, beginning to account for the changes just mentioned. From a program perspective, NASA and Roscosmos needed to adjust the Balance Agreement to address immediate operational needs — crew rotation responsibilities through 2005, crew rescue through early 2006, and Russian launch and return of NASA cargo, also a critical need because of the then-grounded *Shuttle*.

The First Addendum was negotiated when the INA was in force with no relief. NASA lawyers helped to ensure that the Addendum did not result in payments “in cash or in kind” to Roscosmos that were prohibited by the INA. Additionally, NASA lawyers demonstrated to lawyers for the State Department and representatives of other Executive branch agencies that the First Addendum did not result in such payments, as State Department and interagency approval of the agreement through the “Circular 175 process”¹¹ was necessary for the First Addendum to enter into force.

NASA lawyers explained that much of the First Addendum reiterated and confirmed existing obligations under the Balance

national Space Station’ means payments in cash or in kind made or to be made by the United States Government—

(A) for work on the International Space Station which the Russian Government pledged at any time to provide at its expense; or

(B) for work on the International Space Station, or for the purchase of goods or services relating to human space flight, that are not required to be made under the terms of a contract or other agreement that was in effect on January 1, 1999, as those terms were in effect on such date....

Id. at § 7.

¹⁰ Balance Agreement, *supra* note 3, at 2005 Addendum [hereinafter First Addendum].

¹¹ 22 C.F.R. Part 181. 11 U.S. DEPARTMENT OF STATE FOREIGN AFFAIRS MANUAL 720 (Sep. 25, 2006), available at <http://www.state.gov/documents/organization/88317.pdf>

Agreement, and that these continued beyond the originally-planned Assembly Complete date. For example, NASA and Roscosmos agreed that Roscosmos would meet its Balance Agreement *Soyuz* crew rotation obligations sequentially, rather than out of order, which ensured American presence on the *ISS* before *Shuttle* return to flight. In addition, the First Addendum provided for a balanced trade. Under a 1998 amendment to the 1993 NASA-Roscosmos contract, Roscosmos agreed to provide NASA with 4000 research crew hours for close to \$60 million. By late 2004, it was clear that NASA was not going to be able to use the crew hours as originally planned. Because of the grounding of the *Shuttle*, NASA needed upmass — that is, for Roscosmos to launch NASA cargo. So the Addendum provided that NASA would relinquish the remaining contract crew hours and that, until the *Shuttle* returned to flight, Roscosmos would launch up to 1.7MT of NASA cargo (such as crew provisions and critical spares) and would return a small amount of downmass. In January 2005, Circular 175 authority to conclude the First Addendum was obtained and the agreement entered into force.

B. 2005 – 2007

The First Addendum was only an interim measure. Accordingly, further amendments to the Balance Agreement, as well as to the NASA-Roscosmos contract mentioned above, to cover, *inter alia*, purchase of *Soyuz* crew transportation and rescue services and Progress cargo services, were necessary. In addition to the changes outlined above, in 2005, the United States government decided to reduce the number of *Shuttle* flights for the *ISS* to 18 or fewer and obtained consensus from the International Partners to do so.

Moreover, obtaining relief from the restrictions of the Iran Nonproliferation Act was necessary before the Balance Agreement and the NASA-Roscosmos contract could be further amended. Throughout 2005, NASA's lawyers worked with a NASA team and an interagency group, chaired by National Security Council staff, to develop, propose to Congress and then work to enact an amendment to the Iran Nonproliferation Act that would adjust the INA's prohibition on "extraordinary pay-

ments” by the United States Government to Roscosmos and other proscribed Russian entities. In November 2005, the Iran Nonproliferation Amendments Act amended the INA to, *inter alia*, allow for payments to Roscosmos and other proscribed Russian entities until January 1, 2012, for work and services to be performed before that date related to the ISS.¹²

In December 2005, using the new Iran and Syria Nonproliferation Act (ISNA)¹³ exception, NASA concluded a short-term modification to the NASA-Roscosmos contract discussed above. JSC attorneys were closely involved in drafting and negotiating this amendment. This amendment covered immediate needs of the ISS program, including crew transportation and rescue for the next U.S. crewmember on a *Soyuz* and delivery of U.S. cargo to the ISS on the next two Progress flights.

¹² Iran Nonproliferation Amendments Act of 2005, Pub. L. No. 109-112, 119 Stat. 2366 (Nov. 22, 2005), amended the INA to, *inter alia*, adjust the definition of extraordinary payments as follows:

Sec.7. Definitions.

For purposes of this Act, the following terms have the following meanings:

(1) Extraordinary payments in connection with the international space station. The term 'extraordinary payments in connection with the International Space Station' means payments in cash or in kind made or to be made by the United States Government-- ...

(B) for work on the International Space Station, or for the purchase of goods or services relating to human space flight, that are not required to be made under the terms of a contract or other agreement that was in effect on January 1, 1999, as those terms were in effect on such date, *except that such term does not mean payments in cash or in kind made or to be made by the United States Government prior to January 1, 2012, for work to be performed or services to be rendered prior to that date necessary to meet United States obligations under the Agreement Concerning Cooperation on the Civil International Space Station, with annex, signed at Washington January 29, 1998, and entered into force March 27, 2001, or any protocol, agreement, memorandum of understanding, or contract related thereto.* Due to other changes in the statute, the statute was renamed the Iran and Syria Nonproliferation Act.

Id. at § 7 (emphasis added). INA, *supra* note 9, § 7.

¹³ Due to other changes in the statute, the Iran Nonproliferation Amendments Act of 2005 was renamed the Iran and Syria Nonproliferation Act [hereinafter ISNA]. See Iran Nonproliferation Amendments Act of 2005, *supra* note 12, § 4(e)(1).

Negotiations of the Second Addendum to the Implementing Arrangement Entitled “Protocol Including Terms, Conditions and Assumptions, Summary Balance of Contribution and Obligations to International Space Station (ISS) and Resulting Rights of NASA and RSA to ISS Utilization Accommodations and Resources, and Flight Opportunities” (Second Addendum)¹⁴ took place in early 2006. NASA lawyers helped to draft NASA’s proposed agreement. ILPG also helped the Office of External Relations to seek and obtain “Circular 175” authority to negotiate and conclude the agreement. The Second Addendum was intended to partially rebalance NASA and Roscosmos’ obligations over a longer period of time to take into account the factors described above. Critical for NASA was eliminating its obligation to launch the Russian Science Power Platform, given the decreased number of Shuttle flights. Also key was reducing NASA’s obligation to provide metric tons of goods to the *ISS*, given the limited number of *Shuttle* flights remaining and the significant expense involved in purchasing substantial space aboard U.S. commercial providers’ vehicles and International Partners’ vehicles, as they become available. Critical for Roscosmos was ensuring that it has an adequate supply of electrical power to assemble, maintain, and operate the Russian Segment for the life of the Station, given that the Russian Science Power Platform could not have been flown before the planned retirement of the *Shuttle*. From a program perspective, both sides achieved their objectives.

One role of ILPG was to help negotiate appropriate agreement text and provide technical drafting assistance in amending the Balance Agreement. NASA lawyers also worked to ensure that the Addendum was consistent with the ISNA. For most elements of the barter, consistency with the legislation was a matter of providing that payment for, and provision of, the goods and services would all take place by December 31, 2011. Such elements included, for example, Roscosmos’ agreement to provide crew rotation and rescue services and logistics support by contract, and NASA’s agreement to provide stowage and com-

¹⁴ Balance Agreement, *supra* note 3, at 2006 Addendum [hereinafter Second Addendum].

munications services. On two elements of the barter — pertaining to NASA providing Roscosmos with electrical power and also with limited habitation services — continuing the activities beyond 2011 was necessary to conclude the deal. NASA's lawyers helped to establish that NASA could rely on the provision remaining from the original Iran Nonproliferation Act under which NASA is permitted to continue to make payments for work on the *ISS* required to be made under the terms of a contract or agreement in effect on January 1, 1999.¹⁵ NASA provision of both habitation and electrical power is provided for in the 1998 NASA-Roscosmos MOU,¹⁶ an agreement in effect on January 1, 1999. As a continuation of MOU requirements, provision of these services through 2015 was thus permissible.

Ad referendum agreement was reached on the Second Addendum in time for the March 2006 *ISS* Heads of Agency meeting so that the new Assembly schedule, which did not include launch of the Russian Science Power Platform, could be announced at that meeting. The Second Addendum was signed and entered into force in July 2006.

The approach of limiting NASA's provision of goods and services to those that would be provided by Roscosmos prior to January 1, 2012, and that would be paid for prior to that date, was later followed in the amendments to the NASA-Roscosmos contract for crew rotation and rescue services, cargo services, and other Russian-unique goods and services. The principal contract extension, providing for purchase of crew rotation (launch and return) and rescue services until the fall of 2011, cargo services through 2011 and miscellaneous other Russian-unique goods and services was completed in the spring of 2007. It is worth approximately \$719 million.¹⁷ ILPG worked with Headquarters' Contract and Procurement Law Group and JSC lawyers on this modification to address contract law and regulations issues, as well as ISNA issues.

¹⁵ See INA, *supra* note 9, at sec. 7(1)(B) (language quoted in footnote 9; this language remained in place in the ISNA).

¹⁶ NASA-Roscosmos MOU, *supra* note 2, at arts. 3.2 & 6.1.b.20.

¹⁷ Michael Braukus, *NASA Extends Contract With Russia's Federal Space Agency* (Apr. 9, 2007), available at www.nasa.gov/home/hqnews/2007/apr/HQ_C07-18_Roscosmos.txt.

C. 2007 - present

The ISS Partners have agreed that crew size on the ISS should expand from three crew members to six crew members in Spring 2009. The United States is responsible for the crew transportation and rescue services for three USOS crew members on the ISS (whether they be U.S., Canadian, Japanese, or European crew members) beginning at this time. These responsibilities are built into the NASA-Roscosmos contract through the Spring 2011–Fall 2011 flight increment, given the limitations on payments in what is now the Iran, North Korea, and Syria Nonproliferation Act (INKSNA).¹⁸ In technical discussions with Roscosmos in late 2007, however, the Russians made clear that it took approximately 36 months to build a *Soyuz* capsule and that NASA and Roscosmos would need to have a contract in place covering the Fall 2011 – Spring 2012 increment no later than the Fall of 2008 if NASA expected to rely on a *Soyuz* vehicle for that flight.

In the Winter and early Spring of 2008, there were extensive discussions within the Administration, led by officials from the Office of Science and Technology Policy, about the possibility of seeking legislative relief of INKSNA's terms and what an Administration proposal would contain. ILPG lawyers drafted various versions of a possible amendment and its related analysis, and participated in the various discussions. In April 2008, NASA Administrator Mike Griffin sent a narrowly-crafted proposal to Congress. In addition to maintaining the key nonproliferation provisions of INKSNA, the proposal would extend INKSNA's exception to the prohibition on "extraordinary payments" to the Russian government and Russian entities for goods or services relating to the ISS from January 1, 2012 to the end of the life of the ISS. The proposal would exclude from the exception any payments after December 31, 2011, for cargo services provided by a *Progress* vehicle. The proposal would also exclude from the exception payments for crew transportation or

¹⁸ The North Korea Nonproliferation Act of 2006, P.L. 109-353, 120 Stat. 2015 (Oct. 13, 2006), amended ISNA to include North Korea and renamed the statute accordingly. No substantive changes were made to sections 6 and 7.

rescue services provided by a Soyuz vehicle once (1) the U.S. *Orion Crew Exploration Vehicle* reaches Full Operational Capability or (2) a U.S. commercial provider of crew transportation and rescue services demonstrates the capability to meet ISS mission requirements.¹⁹

NASA officials have had detailed discussions with the staff of Committees interested in the legislation, including the Senate Foreign Relations Committee, House Foreign Relations Committee, House Subcommittee on Space and Aeronautics, Senate Commerce Committee and both Chambers' appropriations committees. Several legislative possibilities have been proposed. ILPG has been involved in these discussions and in analyzing the legislative possibilities. On June 9, 2008, Senators Joe Biden and Richard Lugar introduced the Administration's proposal in the Senate.²⁰ Ultimately, after the personal intervention of the Administrator, the Deputy Administrator, and other senior Administration officials with key Congressmen and Senators, a provision was included in the Consolidated Security, Disaster Assistance and Continuing Appropriations Act, 2009 (the Continuing Resolution) that simply changed the date of the INKSNA exception added by the 2005 Iran Nonproliferation Amendments Act²¹ from "January 1, 2012" to "July 1, 2016".

The Continuing Resolution was signed into law by President Bush on September 30, 2008.²² NASA and Roscosmos will now work together on an appropriate amendment or amendments to the NASA-Roscosmos contract²³ that provides for further crew transportation and rescue services and other Russia-unique services (*e.g.*, sustaining engineering and spares).

¹⁹ See International Space Station Payments Act of 2008, S. 3103, 110th Cong. (2008), as introduced by Senators Biden and Lugar at the Administration's request; see also Letter from Michael Griffin, NASA Administrator, to Hon. Joseph R. Biden, Chairman, Committee on Foreign Relations, U.S. Senate, Washington D.C., (April 11, 2008), and enclosed Sectional Analysis. CONG. REC. SENATE, p.S5392 (June 9, 2008) (identical letters were sent to the relevant Congressional Committees and Subcommittees' Chairmen and Ranking Members in April 2008).

²⁰ *Id.* (Congressional Record discussion).

²¹ See Iran Nonproliferation Amendments Act of 2005, *supra* note 12.

²² Consolidated Security, Disaster Assistance and Continuing Appropriations Act, 2009, Pub. L. No. 100-329 (September 30, 2008) [hereinafter Continuing Resolution].

²³ See notes 8 & 17.

II. U.S. SPACE EXPLORATION POLICY – MULTILATERAL COOPERATION

The U.S. Space Exploration Policy, announced by President Bush in January 2004,²⁴ states that its fundamental goal is to “advance U.S. scientific, security and economic interests through a robust space exploration program,” and specifically calls on the Administrator to “pursue opportunities for international participation to support U.S. space exploration goals.”²⁵ At this stage of planning to return to the Moon, the focus of NASA’s attention on the U.S. Space Exploration program is developing the transportation systems – the crew exploration vehicle, the launch vehicles, and the lunar lander – to return to the Moon. NASA, however, also has expended substantial efforts and attention on fostering international cooperation. As the Administrator has stated repeatedly, NASA

will not attempt to prescribe the manner of participation of any of our potential partners. We will work with others to define an exploration architecture suitable to all, and we will identify those portions of the task that we are willing and able

²⁴ The White House, *A Renewed Spirit of Discovery* [hereinafter U.S. Space Exploration Policy], www.whitehouse.gov/space/renewed_spirit.html (last visited Oct. 23, 2008). This policy was confirmed by the U.S. Congress, with strong bipartisan support, with the passage of the NASA Authorization Act of 2005, Pub. L. No. 109-155, 119 Stat. 2946 (Dec. 30, 2005).

²⁵ The U.S. Space Exploration Policy states that in support of this goal, the United States will:

- Implement a sustained and affordable human and robotic program to explore the solar system and beyond;
- Extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations;
- Develop the innovative technologies, knowledge, and infrastructures both to explore and to support decisions about the destinations for human exploration; and
- Promote international and commercial participation in exploration to further U.S. scientific, security, and economic interests.

to accomplish with the funding we can provide. We expect that others will do the same.²⁶

An integral part of U.S. space exploration will be the exploration of the Moon and other destinations in cooperation with international partners.²⁷ NASA's cooperation with international partners has included meeting United States Government commitments to assemble the ISS and various bilateral initiatives with respect to both science and exploration objectives.

A cornerstone of NASA's international cooperation has been a multilateral initiative. Several years ago, NASA initiated a dialogue with representatives of 13 other international space agencies, a group which informally became known as the "Global Exploration Strategy."²⁸ In May 2007, the 14 space agencies agreed on the text and public release of "The Global Exploration Strategy: The Framework for Coordination,"²⁹ informally known as the "Framework Document." The Framework Document presents a vision for robotic and human space exploration, focusing on destinations within the solar system where we may one day live and work.³⁰ The Framework document explains why a sustainable but affordable agenda of globally coor-

²⁶ Michael T. Griffin, NASA Administrator, Address Before the Parliamentary Group on Space at the French National Assembly (June 5, 2008), www.nasa.gov/news/speeches/admin/index.html.

²⁷ U.S. Space Exploration Policy, *supra* note 24.

²⁸ *The Global Exploration Strategy: The Framework for Coordination* [hereinafter *Framework Document*] (May 2007), available at www.nasa.gov/pdf/178109main_ges_framework.pdf 1 [hereinafter *Framework Document*]. For a detailed discussion about the development of the international group and "The Global Exploration Strategy: The Framework for Coordination", see Gibbs *et. al.*, *The Global Exploration Strategy: Developing a Framework for International Coordination and Cooperation*, IAC-07-B3.1.08 (Sept. 2007).

In this context, "space agencies" refer to government organizations responsible for space activities. Participants came from the following 14 space agencies: Australian Commonwealth Scientific and Industrial Research Organization (CSIRO), British National Space Centre (BNSC), Canadian Space Agency (CSA), China National Space Administration (CNSA), French National Center for Space Studies (CNES), German Aerospace Center (DLR), Indian Space Research Organization (ISRO), Italian Space Agency (ASI), Japan Aerospace Exploration Agency (JAXA), Korea Aerospace Research Institute (KARI), National Aeronautics and Space Administration (NASA), National Space Agency of Ukraine (NSAU), Russian Federal Space Agency (Roscosmos), and European Space Agency (ESA). *Framework Document*, *supra* note 28.

²⁹ *Framework Document*, *supra* note 28.

³⁰ *Id.* at 2.

dinated space exploration can serve society through exploring five themes:

- New Knowledge in Science and Technology;
- A Sustained Presence – Extending Human Frontiers;
- Economic Expansion;
- A Global Partnership; and
- Inspiration and Education.³¹

The Framework Document also makes the case for a formal, though non-binding and voluntary, mechanism that could “help coordinate global space exploration by: providing a forum for participants to discuss their interests, objectives and plans in space exploration; and promoting interest and engagement in space exploration activities throughout society.”³² In November 2007, agreement among many of the 14 space agencies was reached on the International Space Exploration Coordination Group Terms of Reference (ISECG ToR).³³

The ILPG provides legal support to the NASA team that participates in this ongoing multilateral process. This Section will thus address several legal issues raised by the work on the Framework Document and the ISECG Terms of Reference.

The Framework Document is a policy statement, not a legally binding instrument. As a consensus-based document, various aspects of the Framework Document raise possibilities but leave open legal issues.³⁴ ILPG worked to make sure the NASA

³¹ *Id.* at ch. 2.

³² *Id.* at ch. 6.

³³ International Space Exploration Coordination Group Terms of Reference (Nov. 2007) [hereinafter ISECG ToR], available at http://esamultimedia.esa.int/docs/exploration/InternationalCoordination/ISECG_ToR.pdf.

³⁴ Underpinning the Framework Document and subsequent cooperation are the four core outer space treaties that establish a legal framework for cooperation related to outer space, including the Moon and other celestial bodies: Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, Jan. 27, 1967, T.I.A.S. 6347, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty]; Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, Apr. 22, 1968, U.N. GAOR, 22nd Sess., Supp. No. 16, U.N. Doc. A/6716 (1968), 19 U.S.T. 7570, 1968 U.S.T. LEXIS

team did not get locked into policy positions which would require particular legal interpretations of existing international agreements or particular next steps. Examples of these areas of concern follow.

The Framework Document embraces the theme of economic expansion and talks about "further commercial expansion into space. As space exploration extends to the Moon and Mars, there will be potential opportunities for companies to provide crew and cargo transportation services, telecommunications and navigation systems, and space-based resource extraction and processing capabilities."³⁵ The Framework Document also mentions real and virtual space tourism on the Moon or Mars. There will likely be clear international consensus that some of these uses are authorized under the 1967 Outer Space Treaty. Some of the uses — depending on how they are carried out — may raise legal issues. Moreover, the section on economic expansion states that for business to be confident about investing, it needs³⁶ a "common understanding on such difficult issues as property rights and technology transfer."³⁷

Whether there will be an international consensus on what property rights exist or should exist with respect to the Moon and other celestial bodies is an open question and there are widely different views as to what the Outer Space Treaty allows (*e.g.*, exclusive use of real property, ability to use minerals and other substances found in or on real property). Art. II of the Outer Space Treaty provides that "[o]uter space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."³⁸ Art. VI of the Outer Space Treaty provides, in relevant part, that

584; Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 961 UNTS 187; Convention on the Registration of Objects Launched into Outer Space, Jan., 14, 1975, U.N. GAOR, 29th Sess., Supp. No. 31, U.N. Doc. A/9631 (1975), 28 U.S.T. 695, 1975 U.S.T. LEXIS 552.

³⁵ *Framework Document*, *supra* note 28, at 11.

³⁶ "For business to be confident about investing, it needs the certainty of a long-term commitment to space exploration, the opportunity to introduce its ideas into government thinking, and the rule of law." *Id.*

³⁷ *Id.*

³⁸ Outer Space Treaty, *supra* note 34, at art. II.

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. 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.³⁹

Some states are likely to take the view that Art. II, in conjunction with Art. VI of the Outer Space Treaty, prohibits private ownership of real property in outer space. In other words, they would read together the prohibition on national appropriation in Art. II and the Art. VI requirement that all activities of non-governmental entities shall be conducted under the auspices of state authority. They would thus conclude that any private appropriation — “ownership” of real property in outer space — requires state action and thus is a prohibited national appropriation.

Other states are likely to take the view that Art. II does not prohibit private ownership. They would rely on the express language of Art. II and argue that, if the negotiators had intended to prohibit non-governmental entities from appropriating property, they would have said so explicitly.

As a second example, change to the International Traffic in Arms Regulations⁴⁰ to make transfer of space-related technology and goods easier was a theme of some of the Global Exploration Strategy space agencies. The Framework document simply speaks of the need for a common understanding regarding “technology transfer.”⁴¹

As a third example, environmental protection in outer space was discussed. The chapter on the Moon ended up with a statement that “the lunar environment is both fragile and spe-

³⁹ *Id.* at art. VI.

⁴⁰ 22 C.F.R. Parts 120 through 130.

⁴¹ See text associated with notes 36 & 37.

cial; we must protect and preserve it even as we explore it”⁴² and the chapter about Mars contains a parallel statement⁴³. Moreover, the Framework Document points out that “[c]omplex issues such as the protection of areas of scientific importance may arise and can be discussed before they block progress.”⁴⁴ The Outer Space Treaty already provides some protections. Art. IX of the Outer Space Treaty requires States Parties to

pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, ...[to] adopt appropriate measures for this purpose.⁴⁵

For each of the three examples, the language used in the Framework Document is sufficiently neutral and noncommittal such that NASA was able to join consensus without a new or updated United States government policy. The Framework Document leaves open what appropriate next steps might be but proposes that the multilateral coordination mechanism will provide a forum to discuss these issues.⁴⁶ The Framework Document also leaves open where NASA will address these issues and other international issues arising as space exploration develops – e.g. through national laws, the ISECG and other multilateral fora, and/or new or amended multilateral treaties. The ISECG ToR provide for a broad and strategic scope of ISECG activities, certainly including these issues if Participating Agencies so decide.⁴⁷

The Framework Document and the work of the ISECG set the stage for bilateral and perhaps multilateral cooperation through legally binding agreements, among other objectives.

⁴² *Framework Document*, *supra* note 28, at 19.

⁴³ *Id.* at 21.

⁴⁴ *Id.* at 13.

⁴⁵ Outer Space Treaty, *supra* note 34.

⁴⁶ *Framework Document*, *supra* note 28, at 11, ch. 6.

⁴⁷ ISECG ToR, *supra* note 33, at I.2. ISECG ToR I.2, in particular, provides that one area for initial consideration is the “assessment of the requirement for any relevant international legal agreements.” *Id.*

For NASA, this will mean agreements concluded under NASA's Space Act authority⁴⁸ with United States government inter-agency coordination led by the State Department. Neither the Framework Document nor the establishment of the ISECG set the stage for one over-arching multilateral agreement, as with the *International Space Station* model. Rather, they foresee a more flexible and open approach. As the ISECG further matures and NASA continues bilateral and multilateral cooperation, there will be many issues and agreements about which the ILPG will engage with NASA's Exploration Systems Mission Directorate, Science Mission Directorate, Space Operations Mission Directorate, Office of External Relations, other NASA policy and program offices, other U.S. agencies, and NASA's international counterparts.

CONCLUSION

As the foregoing discussion indicates, the role of the international lawyers at NASA is broad and varied. NASA lawyers are an integral part of NASA's efforts to structure cooperation in international programs. This article is not meant to be an exhaustive review but to provide insight into two examples of NASA lawyers' contributions to NASA's international cooperative programs.

⁴⁸ National Aeronautics and Space Act of 1958, as amended, 42 U.S.C. § 2451 *et seq.*

THE EXTRA-TERRITORIAL REACH OF U.S. PATENT LAW ON SPACE-RELATED ACTIVITIES: DOES THE “INTERNATIONAL SHOE” FIT AS WE REACH FOR THE STARS?

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I. INTRODUCTION

The law of a nation has its jurisdictional roots planted in such nation's territories and possessions. Thus, the territorial jurisdiction of a national court over a person or a case or controversy concerning an activity typically has its limits defined by the geographical boundaries of the territory to which a particular person resides or an activity originates. Historically, national patent laws have been no exception to this general rule.

Extra-territorial jurisdiction is a limited expansion of the territorial authority of a nation and its courts. A national court may exercise extra-territorial jurisdiction in other countries via a treaty or by such nation's own ministers or consuls in foreign lands. Extra-territorial jurisdiction (or “reach”) of a national court should be based at least in part on a nexus between the

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territory of the forum and the person or the activity to which the court is now interested in seeking to exercise such broader authority. Within the United States, the principle of “minimal contacts” is the doctrine of personal jurisdiction which provides that, before a “foreign” corporation is subject to suit in a “state”, such foreign corporation’s activity within the state must meet certain basic requirements of activity.¹ For a nonresident to be subject to a forum-state court’s personal jurisdiction, he must “have certain minimum contacts with it such that the maintenance of the suit does not offend ‘traditional notions of fair play and substantial justice.’”² Minimal contacts is a somewhat expansionistic doctrine, but it has allowed the individual states in the U.S. to respond “to the actualities of the national market”³ by creating long-arm statutes. Long-arm statutes have limited the practice of foreign corporations avoiding legal responsibilities by scampering across state lines to avoid service of process.⁴ Further, long-arm statutes provide personal jurisdiction over nonresidents of a state, when such nonresidents voluntarily enter into, or communicate with, persons in the state for limited purposes, in cases that concern claims relating to the performance or execution of such limited purposes.⁵ Examples of such closely-related activities to a claim being brought forward include the transaction of business or the commission of a tortious act, either of which results in an injury to a person or damage to property within the state’s borders.

So far, the primary actors in space-related activities have been governmental entities themselves. Other than privately-owned satellites and a limited handful of private citizens traveling aboard the Russian *Soyuz* spacecraft, the property of inter-

¹ *International Shoe Co. v. State of Washington*, 326 U.S. 310 (1945).

² *Id.* at 317. (citing *Milliken v. Meyer*, 311 U.S. 457, 463). The Supreme Court’s specific holding was that a Delaware corporation had, by its activities of employing approximately a dozen resident salesmen to sell its shoes in the State of Washington, rendered itself amenable to proceedings in the courts of that state to recover unpaid contributions to the state unemployment compensation fund exacted by the Washington Unemployment Compensation Act.

³ Wikipedia, http://en.wikipedia.org/wiki/International_Shoe (last visited Nov. 9, 2008).

⁴ *Id.*

⁵ BLACK’S LAW DICTIONARY (8th ed. 2004).

est under current space-related activities is usually a space vessel or structure that is government-owned, or the space traveler is a government employee. For example, the current *International Space Station (ISS)* is a joint project between five governmentally-supported space agencies: the National Aeronautics and Space Administration (NASA, United States), the Russian Federal Space Agency (Roskosmos, Russian Federation), the Japan Aerospace Exploration Agency (JAXA, Japan), the Canadian Space Agency (CSA, Canada) and the European Space Agency (ESA, Europe), which is in turn comprised of eleven member nations.

The growth of government participation by other nations in space-related activities has been further encouraged by President George W. Bush in his 2004 Vision for Space Exploration, in which he announced a plan to return to the Moon by the year 2020. President Bush directed NASA to build “on its long history and extensive and close ties with the space and research agencies of other nations... [by] seek[ing] international partners and work[ing] with the space agencies of these partners in executing future exploration activities.”⁶ To achieve this goal, NASA’s Exploration System Mission Directorate, charged with the responsibility of developing future human exploration programs, has been pursuing broad international partnerships with other nations for a future lunar base. Thus, at least from the perspective of governmental-based activities, it appears that multi-national partnerships for space-related activities and the proximal interconnectivity of multinational spacecraft that result from these partnerships will continue to exist and should grow.

Government participation in the space-related activity of interest would seemingly provide enough of a nexus to support a claim of jurisdictional interest by a court of corresponding national origin. Yet private commercial activities are on the rise, and economic growth in this area can be expected to continue in the coming years. It is even conceivable that human presence in

⁶ NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, THE VISION FOR SPACE EXPLORATION 17 (Feb. 2004), available at http://history.nasa.gov/Vision_For_Space_Exploration.pdf.

low-earth orbit funded entirely by a private commercial entity will occur by the beginning or middle of the next decade. Would a national government's participation in the development of a multi-national spacecraft also provide enough of a nexus to support a claim of jurisdiction to activities occurring therein by the corresponding national court?

For instance, the *ISS* has been designed for conducting scientific research and experimentation unique to a microgravity environment by highly skilled astronauts and scientists. Experiments to be carried out on the *ISS* include the scientific fields of human physiology, medicine, biology, propulsion systems, and long-term space exposure (just to name a few). In particular, the pharmaceutical sector has been identified as a scientific field that will, in all likelihood, benefit from experiments carried out on the *ISS*. Currently, the United States (U.S.), ESA, and Japan have on-orbit, operating, *ISS*-laboratory modules specifically designed for conducting such experiments. The Russian Federation has plans for its own laboratory module with an estimated launch date of December 2011. In terms of the future status of the U.S. segments on the *ISS*, once *ISS* assembly is complete, NASA plans to transition the U.S. segments of the *ISS* into a National Laboratory and dramatically increase commercially-funded research and development activities on-board the *ISS*. While still in the planning stages, a future National Laboratory is currently envisioned to continue to operate within the framework of the *ISS* and the existing international agreements. The *ISS* thus represents a novel "territory" for potential innovations that may result in patentable inventions as well as a resource wherein patented inventions are used or practiced. One may reasonably expect patentable inventions to be conceived on the *ISS*. In addition, patentable inventions may be conceived on Earth and actually reduced to practice or used for their intended purposes on the *ISS*.

The question of extra-territorial reach of one nation's courts to activities, persons, and structures in outer space presents an opportunity to re-examine the established notion of restraint when exercising jurisdiction beyond traditional territorial borders. Outer space, including celestial bodies and the Moon, are territories that are considered to be, at least initially, "*res com-*

munis”, that is, things common to all and that cannot be owned or appropriated.⁷ The lack of true territorial jurisdiction in space poses some interesting questions to consider: What constitutes an appropriate expansion of jurisdiction by a nation and its courts into a territory that cannot be owned or appropriated by any nation? Should some type of nexus exist between a nation and the person or the activity of jurisdictional interest, as is currently required for personal jurisdiction within the United States under the principle of minimal contacts and its related long-arm statutes, if such nation seeks to exercise a broader authority over space-related activities? Will an international treaty, an agreement among a group of space-faring nations that includes the United States, or a legislative act of Congress suffice to bring appropriate authority for a jurisdictional claim when private corporate entities of other third-party nations might emerge as a primary participant in human space travel?

An attempt to address all of these questions is beyond the scope of this article. Rather, this article will focus on issues related to the expansion of territorial jurisdiction for the protection of intellectual property associated with space-related activities. Specifically, we will examine this question: “What laws, if any, and in particular, what U.S. patent laws, apply to inventions and patent rights for activities in outer space?” U.S. patent law has several specific statutory provisions that concern jurisdictional and extra-territorial reach.⁸ We will examine a number of these statutory provisions and the particularities they present. As an outline, this article will address the following areas:

- brief overview of patents and the U.S. Patent system;
- introduction to the Outer Space Treaty and the ISS Intergovernmental Agreement;
- extra-territorial reach as it relates to infringement under U.S. patent law;

⁷ BLACK’S LAW DICTIONARY, *supra* note 5.

⁸ See *e.g.*, 35 U.S.C. §§ 102(a), (b), (g)(2), 104(a), 105, 271-272.

- the Temporary Presence Doctrine;
- identification of potential issues by analysis of exemplary hypothetical cases; and
- possible techniques for avoiding or mitigating jurisdictional problems as they relate to patent law.

The article's case analysis of the hypothetical cases will seek to assess potential patent infringement issues on the *ISS* and at a future international lunar base resulting from the close proximity of habitable modules registered under a variety of nations. Further, commercial scenarios in outer space will be evaluated for potential patent infringement issues.

II. BRIEF OVERVIEW OF PATENTS

In most nations, a patent represents a property right granted by the national government for a fixed period of time to an applicant who is an inventor or group of inventors, or to a representative thereof, which made a new invention. This property right is normally limited to the territorial reach of the granting nation.⁹ Hence, patent law is inherently territorial in nature. Once issued, a patent authorizes its owner(s) the right to exclude others from practicing or otherwise engaging in a particular activity.¹⁰ The grant and enforcement of patents are based on and governed by national laws, or on occasion by international treaties that have given regional effect to a nationally issued patent.

The scope of an invention is defined by the claims of a patent. A "claim" is a legal description of the subject matter that an inventor regards as his invention.¹¹ The property right associated with the patent allows a patent owner the right to exclude others from practicing the claimed invention. Patents may be sold, purchased, licensed, or otherwise exchanged in a

⁹ See *e.g.*, *Deepsouth Packing Co. v. The Laitram Corporation*, 406 U.S. 518, 532 (1972) (superseded on other grounds by Patent Amendments Act of 1984, Pub. L. No. 98-622, 98 Stat. 3383 (now codified at 35 U.S.C. §§ 271(f)) [hereinafter *Deepsouth*]).

¹⁰ See 35 U.S.C. § 154.

¹¹ See 35 U.S.C. § 112.

manner similar to real or personal property. The right to exclude others from practicing the claimed invention does not necessarily give the patent owner the right to practice the claimed invention himself. Instead, in order to practice the claimed invention, the patent owner may have to comply with other laws or regulations to practice the invention, obtain licenses from other patent owners, or any combination thereof.

To obtain a patent, an inventor or group of inventors must first file a patent application [hereinafter application] in a jurisdiction of interest. The inventor or group of inventors who file an application is referred to as the Applicant or Applicants, respectively. An application may begin as an international or "PCT" (Patent Cooperation Treaty) application, which enables a domestic application to be later filed in a particular country or group of countries. However, an application under the PCT is incapable of enforcement unless the application enters the national phase by a subsequent filing of an application in an appropriate governmental office responsible for processing the application for a particular "State" or "Region."

In the U.S., the applicable governmental office is the United States Patent and Trademark Office or "USPTO." The USPTO employs a number of scientists and engineers as "Examiners," who analyze or examine applications to determine patentability. Examiners, skilled in their particular area of technology, are charged with analyzing the application in light of the "prior art" and patent laws to determine if the application should be permitted to issue as a patent. If the Examiner determines that any claim of the patent application does not meet the statutory criteria for a patent, the Examiner will reject the claim. The Examiner's basis for any rejection is documented in a communication known as an "Office Action," to which the Applicant, typically represented by a patent attorney or agent, responds. An Office Action may contain more than one ground for rejection, each of which must be addressed in the Applicant's response. Currently, the examination process in the U.S. generally takes about three years from the filing date of a final or "non-provisional" application. If all grounds for rejection have been adequately addressed by the Applicant to the Examiner's satisfaction, the application will ultimately issue as a patent.

III. INTRODUCTION TO THE OUTER SPACE TREATY AND THE ISS INTERGOVERNMENTAL AGREEMENT

Perhaps the formative instrument related to establishing an international legal framework for activities conducted in outer space is the 1967 “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies,”¹² [hereinafter Outer Space Treaty]. All major space-faring nations have signed and ratified the Outer Space Treaty. Under this treaty, the signatories agreed, “A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body.”¹³ This principle is analogous to the “floating island” principle existing in maritime law for ships in international waters. Further, the signatories agreed, “Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.”¹⁴ This principle, described above as *res communis*, has been negotiated and accepted as terms for international treaties concerning terrestrial geographic areas, such as Antarctica and international waters. Such territories do *not* fall under any state’s territorial jurisdiction.¹⁵

In January 1998, fifteen nations executed an international treaty known as the “ISS Intergovernmental Agreement” or “IGA.” The IGA provides a “framework on the basis of genuine partnership, for the detailed design, development, operation, and utilisation of a permanently inhabited civil Space Station for peaceful purposes, in accordance with international law.”¹⁶

¹² Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Oct. 10, 1967, 18 U.S.T. 2410, T.I.A.S. 6347 [hereinafter Outer Space Treaty].

¹³ *Id.* at art. VIII.

¹⁴ *Id.* at art. II.

¹⁵ See e.g., *Smith v. United States*, 507 U.S. 197 (1993) (holding that the Federal Tort Claims Act does not apply to tortious acts or omissions occurring in Antarctica, a sovereignless region without civil tort law of its own).

¹⁶ Agreement Among the Government of Canada, Governments of the Member States of the European Space Agency, the Government of Japan, the Government of the

Article 21 of the IGA specifically addresses Intellectual Property. Article 21 states,

for the purposes of intellectual property law, any activity occurring in or on a Space Station flight element shall be deemed to have occurred only in the territory of the Partner State of that element's registry, except that that for ESA-registered elements any of the eleven European Partner States may deem the activity to have occurred within its territory.¹⁷

Thus, the intellectual property provisions of the IGA followed the general principle of national jurisdiction found in the Outer Space Treaty for activities, including inventions occurring within registered space objects. For example, an invention made on a Russian Federation segment of the *ISS* will be deemed to have occurred in Russia, and Russian patent law will apply. The situation becomes somewhat more complicated if an invention is made on an ESA-registered segment. Specifically, any European Partner State may elect to deem the inventive activity occurred within its territory. The complications of this arrangement of concurrent jurisdiction will shortly be examined and addressed below.

Article 21 also addresses the Partner States' respective invention secrecy laws. In the U.S., the Invention Secrecy Act restricts the filing or dissemination of patent applications for national security purposes. Similarly, the national laws of many other states impose a delay or require prior authorization before a patent application can be filed in a foreign country. In the U.S., a foreign filing license¹⁸ is required from the USPTO before an application may be filed in a foreign country. Article 21 of the IGA places some limitation on the application of a Partner State's invention secrecy laws.¹⁹ In general, for an invention made on the *ISS*, one must: (1) determine where the invention was "made" (i.e., which country registered the specific

Russian Federation, and the Government of the United States of America Concerning Cooperation on the Civil International Space Station, Jan. 28, 1998, at art. 1 [hereinafter IGA].

¹⁷ *Id.* at art. 21.2.

¹⁸ 35 U.S.C. § 184.

¹⁹ IGA, *supra* note 16, at art. 21.3.

ISS module); (2) determine the nationality of the inventor; and (3) determine if the invention rises to the level of being designated as embodying classified information or otherwise protectable under the concept of “national security.” As an example, if the invention was made by a Canadian national in the U.S. Lab module of the *ISS* and is considered a national security asset, article 21 states that the U.S. cannot impose its invention secrecy laws and restrict the Canadian national inventor from filing a patent application in Canada (provided Canada has invention secrecy laws). Once an individual has filed a patent application in a particular Partner State, that State may subsequently apply its invention secrecy laws.

Article 21 also addresses infringement and licensing issues associated with the concurrent-jurisdictional arrangement for the member States of the ESA. For example, consider the scenario wherein an invention, patented in all ESA member States, is used or performed onboard the ESA Lab (*Columbus*) module. Under the concurrent-jurisdictional arrangement, the patent owner could theoretically file a patent infringement suit in all eleven ESA member States for a single infringing act. Article 21 remedies this potential outcome by stating that “where a person or entity owns intellectual property which is protected in more than one European Partner State, that person or entity may not recover in more than one such State for the same act of infringement.”²⁰ Article 21 also provides that “satisfaction of a judgment rendered for damages...shall bar further recovery of damages in any pending or future action for infringement based upon the same act of infringement.” In terms of licensing issues, article 21 states that “no European Partner State shall refuse to recognize a license for the exercise of any intellectual property right if that license is enforceable under the laws of any European Partner State.” Thus, if a licensee has the right to practice a patented invention in any European Partner State, that licensee has the right to practice the patented invention in or on an *ISS* ESA module.

²⁰ *Id.* at art. 21.4.

In sum, both the Outer Space Treaty and the IGA have attempted to address territorial jurisdictional questions, even issues associated with intellectual property. While this international treaty and agreement, respectively, have been made among space-faring nations that include the United States, they leave open the question as to what would be the appropriate authority for a jurisdictional claim when private corporate entities are the primary actors in space-related activities.

IV. EXTRA-TERRITORIAL REACH AS IT RELATES TO INFRINGEMENT UNDER U.S. PATENT LAW

As mentioned earlier in Part II, inventors may obtain a patent from the USPTO if their invention is determined to be useful²¹, novel²², nonobvious²³, sufficiently described and enabled in the patent application.²⁴ An inventor who has obtained a patent from the USPTO is generally referred to as a "Patentee." In general, a Patentee can sue in a U.S. Federal Court if there has been an unauthorized, statutorily-defined activity related to the Patentee's claimed invention. Such unauthorized, statutorily-defined activities are given in Title 35 of the United States Code (U.S.C.), Chapter 28, which forms the foundation of what constitutes a "patent infringement" in the United States. The core of the U.S. Patent Act's provisions on infringement has historically been explicitly territorial in its jurisdictional scope of infringing subject matter. For example, § 271(a), as currently amended, states:

Except as otherwise provided in this title, whoever without authority makes, uses, offers to sell, or sells any patented invention, *within the United States*, or imports *into the United States* any patented invention during the term of the patent therefor, infringes the patent." (emphasis added)

²¹ 35 U.S.C. § 101 states, "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of [U.S. patent law]."

²² 35 U.S.C. § 102.

²³ 35 U.S.C. § 103.

²⁴ 35 U.S.C. § 112.

We will now discuss some court decisions that have examined the territorial scope of the U.S. Patent laws, both before and after the passage of the modern-day patent act,²⁵ in association with different types of actors before the court and with varying degrees of activity occurring beyond the borders of the United States. Discussion of these cases provides insight into the framework of a court's analysis of the jurisdictional issue, which generally favors a presumption against extra-territorial reach. The U.S. courts have traditionally focused carefully on the specific facts presented to determine whether the subject matter of each case, examining both the actor and the activity of concern, provides an appropriate nexus to hold that the activity is within its territorial reach. These cases thereby shed light on what space-based activities might also be found to be "within the United States" for issues related to patent infringement.

A. Territorial Scope before the U.S. Patent Act of 1952

Even before the enactment of the U.S. Patent Act of 1952, the U.S. Supreme Court had taken a restricted view of subject matter jurisdiction with respect to the territorial reach of U.S. patent law, favoring a presumption against an extra-territorial effect.²⁶ For instance, in 1856 the Supreme Court refused to extend the rights of an owner of a U.S. patent to apply to the activities of a French schooner that had temporarily docked at a Boston port.²⁷ The defendant in *Brown*, who was the captain of the schooner, had answered the complaint of the patent owner by demurrer and pleaded that he and his ship were subjects of the French empire, that he was temporarily located in the United States, and that the alleged infringement occurred while

²⁵ U.S. Patent Act of 1952, 35 U.S.C. §§ 1-376, Pub. L. No. 593 (July 19, 1952) (including amendments).

²⁶ See Robert W. Pierson, *Extraterritorial Reach of U.S. Patent Law: Has the Federal Circuit Gone Too Far?*, 17 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 651, 655 (2007), available at <http://law.fordham.edu/publications/articles/200flspub7855.pdf> (last visited on Nov. 9, 2008).

²⁷ *Brown v. Duchesne*, 60 U.S. 183 (1856) (as support for its ruling, the court opined "acts of Congress do not and were not intended to operate beyond the limits of the United States, and as the patentee's right of property and exclusive use is derived from them, they cannot extend beyond the limits to which the law itself is confined.").

upon a lawful voyage between a French colony and Boston.²⁸ The Court framed the issue to be considered as “whether any improvement in the construction or equipment of a foreign vessel for which a patent has been obtained in the United States can be used by such vessel within the jurisdiction of the United States while she is temporarily there for the purposes of commerce, without the consent of the patentee?”²⁹ Thus, the Court was presented with a mixed question of personal and subject matter jurisdiction in that both the infringing actor and the infringing activity had a temporary connection to the United States. The Court, however, apparently considered the territorial reach at issue in this case of infringement to rest more squarely on the shoulders of subject matter rather than personal jurisdiction. Specifically, the Court stated:

This question depends on the construction of the patent laws. For undoubtedly every person who is found within the limits of a government, whether for temporary purposes or as a resident, is bound by its laws. The doctrine upon this subject is correctly stated by Mr. Justice Story in his “Commentaries on the Conflict of Laws” chap. 14, sec. 541, and the writers on public law to whom he refers. A difficulty may sometimes arise, in determining whether a particular law applies to the citizen of a foreign country and intended to subject him to its provisions. But if the law applies to him and embraces his case, it is unquestionably binding upon him when he is within the jurisdiction of the United States.³⁰

The *Brown* Court found that the infringing equipment had been placed upon the vessel before entry into the United States.³¹ The Court also determined that the equipment was not for use while “at anchor in the port” and that the equipment had not been “manufactured on her deck while she was lying in the port of Boston.”³² Given that the alleged infringing activity relating to the foreign vessel had occurred while away from port,

²⁸ *Id.* at 193.

²⁹ *Id.* at 194.

³⁰ *Id.* at 194.

³¹ *Id.* at 195-96.

³² *Id.* at 196.

the Court concluded that the defendant's use "was on the high seas and in other places out of the jurisdiction of the United States."³³

Similarly, in 1915, the U.S. Supreme Court, while considering a patentee's rights to recover damages related to a patented component known as "shoe drills", denied recovery for damages attributable to the defendant's sales of the infringing product in Canada, even though the grain drill incorporating the patented component had been made and purchased by the defendant in the United States.³⁴ The Court noted that a third party had made the infringing drills in the United States and then sold them to the defendant.³⁵ In finding no liability for the sales activity of the defendant that took place in Canada, the Court explained that "[t]he right conferred by a patent under our law is confined to the United States and its territories, and infringement of this right cannot be predicated of acts wholly done in a foreign country."³⁶ The Court determined that the alleged infringing activities of the defendant were beyond the territorial reach because the place of sale was "of controlling importance here."³⁷

The first reported expansion of the "territorial" reach of U.S. patent law appears to have occurred in a somewhat obscure 19th Century decision out of the Circuit Court of Massachusetts that concerned an infringement claim against an American vessel.³⁸ The facts in *Gardiner* were somewhat similar to the facts of *Brown*. The plaintiff sought to recover damages for the infringement of a patent to the improvement of a sail for vessels, except in this case the vessel was American and commanded by an American "master" on her passage from Liverpool to New York.³⁹ The defendant sought to defend the claim by showing that the patented invention was used "on the high

³³ *Id.* at 196.

³⁴ *Dowagiac Mfg. Co. v. Minnesota Moline Plow Co.*, 235 U.S. 641 (1915)

³⁵ *Id.* at 650.

³⁶ *Id.* at 650.

³⁷ *Id.* at 650.

³⁸ *Gardiner v. Howe*, 2 Cliff. 462, 9 F.Cas 1157 (C.C.D. Mass. 1865) (No. 5219).

³⁹ *Id.*

seas, and without the jurisdiction of the United States”⁴⁰, citing as authority the U.S. Supreme Court’s decision of *Brown v. Duchesne*.⁴¹ The *Gardiner* Court found that *Brown* could be readily distinguished here in that the vessel at issue was American. Specifically, the *Gardiner* Court held that while “[t]he patent laws of the United States afford no protection to inventions beyond or outside of the jurisdiction of the United States[,]. . . this jurisdiction extends to the decks of American vessels on the high seas, as much as it does to all the territory of the country, and for many purposes is even more exclusive.”⁴² The *Gardiner* Court reasoned that “[w]ere it to be held that in cases like the present the plaintiff is not entitled to recover, patents for improvements in the tackle and machinery of vessels, or in their construction, would be valueless.”⁴³ In one sense, the *Gardiner* Court’s rationale for expanding its territorial reach appears to rely on its own notion of fairness, a rationale that has since evolved to find support in the jurisprudence of personal jurisdiction through the principle of minimal contact, i.e., “fair play and substantive justice.” This notion of fairness, however, has not expressly been relied on by the courts in determining subject matter jurisdiction under the U.S. Patent laws.

The jurisdictional theory of *Gardiner* also differs from the jurisdictional approach of *Brown* in that it is based on the nationality of the vessel as opposed to the geographical location of the vessel. National jurisdiction is “based on the nationality of persons or things subject to state control.”⁴⁴ Conversely, territorial jurisdiction is based on the actual borders defining the geographic limitations of a nation. These two principles “are often confused” with one another “but they are in fact distinct.”⁴⁵ Given that Congress has subsequently amended the Patent Act

⁴⁰ *Id.*

⁴¹ *Brown, supra* notes 27 - 33.

⁴² *Gardiner, supra* note 38, at 462.

⁴³ *Id.*

⁴⁴ See Glenn H. Reynolds, *Legislative Comment: The Patents in Space Act*, 3 HARVARD J.L. & TECH. 13, 18 (1990), available at <http://jolt.law.harvard.edu/articles/pdf/v03/03HarvJLTech001.pdf> (last visited on Nov. 9, 2008).

⁴⁵ *Id.*

to define the United States as being limited outside its borders to "its territories and possessions", substantive arguments can be readily made that the outcome in *Gardiner* was incorrect in finding territorial reach under U.S. patent law for activity of a private entity, even though U.S. flagged, on the high seas.⁴⁶ One commentator has even suggested that a possible purpose of Congress in adding this language to the patent law was specifically to overrule *Gardiner*.⁴⁷ Nevertheless, the extra-territorial reach found by the *Gardiner* Court, applying U.S. law to U.S. flagged vessels on the high seas, has been embraced and adopted as the jurisdictional principle of both the Outer Space Treaty and the IGA.

B. Territorial Scope After the U.S. Patent Act of 1952

Congress's passage of the U.S. Patent Act of 1952 [hereinafter *Patent Act*] seemingly endorsed the Court's longstanding tradition of the limited territorial scope of U.S. patent law. For instance, the Act included a provision entitled "Temporary Presence in the United States",⁴⁸ which provided that "[t]he use of any vessel aircraft or vehicle of any country" that affords similar privileges to those of the United States shall not constitute infringement when entering the United States temporarily or accidentally, "if the invention is used exclusively for the needs of the vessel, aircraft or vehicle and is not sold in or used for the manufacture of anything to be sold in or exported from the United States."⁴⁹ This statute was a codification of the Supreme Court's *Brown* decision. The Patent Act also included a section entitled "Definitions" that provided that "[t]he terms 'United States' and 'this country' mean the United States of

⁴⁶ See for instance the Supreme Court's discussion of this Congressional act in *DeepSouth*, *supra* note 9, at 530.

⁴⁷ Reynolds, *supra* note 44, at 21. The commentator opens his criticism of the *Gardiner* decision (at p. 20) by stating that "case law purporting to support the application of U.S. patent law to U.S. space objects is of doubtful value", but the commentator also notes at p. 21 that the outcome of *Gardiner* "was correct on policy if not legal grounds." *Id.*

⁴⁸ Codified at 35 U.S.C. §§ 272.

⁴⁹ U.S. Patent Act of 1952, *supra* note 25, at ch. 950.

America, its territories, and possessions.”⁵⁰ Finding little to dissuade its limited view of territorial scope of U.S. Patent law, the U.S. Supreme Court continued to favor a presumption against extraterritorial effect unless there was “a clear congressional indication of intent to extend the patent privilege.”⁵¹ Congress eventually accepted the Court’s invitation in *DeepSouth* to provide such clear intent, enacting § 271(f) of Title 35, in essence creating a statutory exception to the Court’s *DeepSouth* holding by making it an infringement to export unpatented components of a patented combination invention for later completed assembly abroad.⁵² As will be discussed *infra*, Congress has also sought to expand the territorial reach of Title 35 to space objects and components.⁵³

The expansion of extra-territorial reach of U.S. patent law in the context of U.S. citizens and spacecraft on the Moon was addressed by the USPTO’s Board of Appeals (the predecessor to the Patent Office Board of Appeals and Interferences) in *Ex Parte McKay*.⁵⁴ In this case, the USPTO Board of Appeals was concerned with an earlier rejection of a patent application for a process of obtaining oxygen from extra-terrestrial materials in one representative set of the claims and from lunar surface material in another representative set of the claims. The patent application’s specification described the use of the process on the Moon.⁵⁵ The Examiner’s rejection was based partially on a strict territorial argument that U.S. patent law does not extend to inventions whose “process is to be carried out outside the United States”⁵⁶ (in this case the Moon), citing 35 U.S.C. § 100 and § 154. While rejecting the application under other grounds of obviousness, the Board of Appeals rejected the Examiner’s territorially-based rejection. The Board first recognized that the *res communis* principle of article II of the Outer Space Treaty was somewhat at odds with the subject matter of the claims of

⁵⁰ *Id.* at § 100(c).

⁵¹ *See, e.g., DeepSouth supra* note 9, at 532 (1972).

⁵² Patent Amendments Act of 1984, *supra* note 9.

⁵³ 35 U.S.C. § 105.

⁵⁴ *Ex Parte McKay*, 200 U.S.P.Q. 324 (Pat.Off.Bd.App. 1975).

⁵⁵ *Id.* at 325

⁵⁶ *Id.*

the patent application and the extension of jurisdiction by means of the national jurisdictional principle of article VIII. Ultimately relying on article VIII of the treaty to find jurisdiction, the Board of Appeals held,

[i]t is clear from article VIII of said Treaty that jurisdiction of the United States in personam over any person is present if the object launched into outer space is of United States registry. A patent grant under 35 U.S.C. § 154 by the United States for a process to be carried out on the moon by personnel subject to its jurisdiction is thus not inimical and at variance with

U.S. patent law.⁵⁷ Thus, the Board of Appeals relied on the policies defined in the Outer Space Treaty as opposed to the law as defined in Title 35 of the United States Code. Given that the United States has been clearly defined in the Patent Act to be limited outside its borders to "its territories and possessions,"⁵⁸ commentators have suggested that the reasoning in *Ex Parte McKay* was incorrectly decided in finding *in personam* jurisdiction.⁵⁹ Thus, even after *Ex Parte McKay*, questions remained as to the applicability of Title 35 to activities aboard vehicles in outer space due to the lack of explicit territorial language in the U.S. patent law relating to outer space.

Another case related to territorial scope after the Patent Act is *Decca Limited v. United States*.⁶⁰ Decca brought a 28 U.S.C. § 1498 action against the U.S. Government for patent infringement. Although technically not a 35 U.S.C. § 271(a) case, the territorial requirements of what constitutes an infringement by the U.S. Government as compared to a non-governmental entity are essentially the same. The alleged infringing technology involved a worldwide radio navigation system with two stations in the United States and one station in Norway. The subject system was designed and built by the U.S. Government. Further, the technology was dependent on at least

⁵⁷ *Id.*

⁵⁸ 35 U.S.C. § 100(c).

⁵⁹ See Reynolds, *supra* note 44.

⁶⁰ *Decca Limited v. United States*, 210 Ct. Cl. 546, 552-53, 544 F.2d 1070, 1074-75 (Ct. Cl. 1976) [hereinafter *Decca*].

two stations, one of which served as a “master station,” with the second station being controlled by the master station to ensure signal synchronization. A third station was required for position location and was also controlled by the master station. In practice, the actual master station was located in the U.S. Ultimately, the Court found, “[1] ownership of the equipment by the United States, [2] the control of the equipment from the United States and ... [3] the actual beneficial use of the system within the United States”⁶¹ justified the application of U.S. law. Thus, in the absence of unauthorized infringing activities entirely within the territorial boundaries of the U.S., the Court seemingly created a three-prong test for finding such activity “within the United States”: (1) U.S. ownership, (2) control from the U.S., and (3) beneficial use within the U.S.

The extra-territorial reach of U.S. patent law to a transnational telecommunications system was re-examined in *NTP v. Research in Motion*.⁶² This case, in part, directly addressed 35 U.S.C. § 271. The subject technology related to systems for integrating existing electronic mail systems (“wireline” systems) with radio frequency (RF) wireless communication networks, to enable a mobile user to receive email over a wireless network.⁶³ The technology was integrated in the Canadian-based Research in Motion’s BlackBerry® handheld devices, which provided mobile email access to users of such devices in the United States by use of Research in Motion’s wireless network located in Canada. As to the issue of whether or not the BlackBerry® devices infringed NTP’s patents, the Court considered the question of “whether the using, offering to sell, or selling of a patented invention is an infringement under section 271(a) if a component or step of the patented invention is located or performed abroad.”⁶⁴ NTP’s patented technology consisted of system (i.e., apparatus) and method (i.e., process) claims. The Court addressed what constitutes “use” in the context of both a system

⁶¹ *Id.* at 1083.

⁶² *NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1282 (Fed. Cir. 2005) [hereinafter *NTP*].

⁶³ *Id.* at 1287.

⁶⁴ *Id.* at 1315.

and a method claim. The Court cited *Decca* as instructive⁶⁵ and providing a “legal framework”⁶⁶ for analyzing its case. Yet, in regard to the system claim, the Court stated, “[t]he use of a claimed system under section 271(a) is the place at which the system *as a whole* is put into service.”⁶⁷ The Court used two of the *Decca* prongs for its consideration. Specifically, “control of the system” and “beneficial use” were cited by the Court.⁶⁸ “Ownership,” on the other hand, was not used by the Court in its analysis.⁶⁹ As to the method claims, the Court used a different approach to determine whether there was an infringement “within the United States.” The Court stated, “[w]e therefore hold that a process cannot be used ‘within’ the United States as required by section 271(a) unless each of the steps is performed in [the United States].”⁷⁰ Thus, the Court applied different tests for determining territorial reach for system and method claims directed to essentially the same technology. For system claims, the Court decided to use two of the *Decca* prongs (“control” and “beneficial use”) but not the third (“ownership”) while presenting a strict territorial test for the place of performing acts of the method claims.

Although these cases provide, as the *NTP* Court states, a legal framework for addressing the issue of what constitutes “within the United States” for purposes of patent infringement, the only consensus that these cases seemingly offer is that the ultimate determination of what constitutes an unauthorized activity “within the United States” is a mixed question of fact and law to be determined by the subject matter, in particular the location and extent of the allegedly infringing activity and the type of claims in the patent, on a case-by-case basis. As one commentator has noted, “[c]ourts have provided extraterritorial effect to U.S. patents not by broadly interpreting the Patent Act,

⁶⁵ *Id.*

⁶⁶ *Id.* at 1316.

⁶⁷ *Id.* (emphasis added).

⁶⁸ *Id.* at 1317.

⁶⁹ Research in Motion is a Canadian corporation. If the Court had used all three “*Decca*” prongs, it would have reached a different holding because there was no U.S. “ownership” in regards to Research in Motion.

⁷⁰ *NTP*, *supra* note 62, at 1318.

but rather by broadening the concept of subject matter considered to be inside the United States.”⁷¹

C. Extra-Territorial Reach Under the Inventions in Outer Space Act of 1990

Jurisdictional questions related to space-based activities were to a certain extent resolved in 1990 when Congress added 35 U.S.C. § 105, entitled “Inventions in Outer Space” to U.S. patent law. 35 U.S.C. § 105 recites its general rule in the beginning of paragraph (a): “Any invention *made, used, or sold* in outer space on a space object or component thereof under the jurisdiction or control of the United States shall be considered made, used or sold within the United States for the purposes of this title....”⁷²

The statute continues by providing exceptions to this general rule. The statutory exceptions include “any space object or component thereof that is specifically identified and otherwise provided for by an international agreement to which the United States is a party.”⁷³ Further, 35 U.S.C. § 105(b) includes an exception whereby an invention “made, used, or sold in outer space on a space object or component thereof” registered in a foreign country can be considered to be “made used or sold within the U.S.” if agreed upon in an international agreement between the U.S. and the state of registry.⁷⁴ Another statutory exception in 35 U.S.C. § 105(a) provides that even if a space object or component thereof is under the jurisdiction or control of the U.S., it will *not* be considered U.S. territory if it is registered by a foreign state in accordance with the Registration of Objects Launched into Outer Space [hereinafter Registration Convention]. Thus, an international agreement to which the U.S. is a

⁷¹ See Pierson, *supra* note 26, at 655.

⁷² 35 U.S.C. §§ 105(a) (emphasis added).

⁷³ *Id.*

⁷⁴ “Any invention made, used, or sold in outer space on a space object or component thereof that is carried on the registry of a foreign state in accordance with the Convention on Registration of Objects Launched into Outer Space, shall be considered to be made, used, or sold in the United States for the purposes of this title if specifically agreed in an international agreement between the United States and the state of registry.” 35 U.S.C. §105(b).

party and the registration of a space object or component thereof can effectively define the territorial jurisdiction of any patented inventions made, used, or sold in outer space on the space object or component thereof.

The language “jurisdiction or control of the United States” in 35 U.S.C. § 105(a) presents some interesting fodder for discussion and debate. The statute’s legislative history⁷⁵ explains that the term “under the jurisdiction *or* control” (emphasis added) was modified⁷⁶ from article VIII of the Outer Space Treaty,⁷⁷ which uses the term “jurisdiction *and* control.” One could argue that because this term originated from article VIII of the Outer Space Treaty, it is more likely than not that the word “control” is related to “jurisdiction” and thereby effectively means “jurisdictional control” as opposed to a connotation of “operational control.” Conversely, one could counter that because the conjunction was changed from “and” to “or,” the drafters of § 105 intended a different meaning for the word “control” and its related phrase of “jurisdiction or control” as compared to the Outer Space Treaty. This distinction is important because if one argues the latter interpretation, the object of the preposition (i.e., United States) would support an interpretation that means the control of the United States Federal Government, such as NASA or the Department of Defense. Conversely, if one argues the former interpretation, the “United States” would likely mean the United States as a geographical territory embodied by its national government, thereby invoking the jurisdiction of the U.S. courts. Both of these interpretations of the term “United States” appear in different parts of 35 U.S.C. § 105.⁷⁸ The legis-

⁷⁵ S. REP. NO. 266, 101st Cong. (1990) at 7.

⁷⁶ *Id.*

⁷⁷ “A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body”, Outer Space Treaty, *supra* note 12, at art. VIII (emphasis added).

⁷⁸ Consider the language, “made, used, or sold in the United States.” The “United States” in this context means, arguably, a national state entity geographically defined by territorial borders. Further, consider the language, “to which the United States is a party.” The “United States” in this context means, arguably, the U.S. Federal Government. Further, the legislative history of § 105 specifically states that “to which the United States is a party” encompasses a Federal agency of the U.S. Government (*see* S. REP. NO. 101-266, at 7).

lative history notes that U.S.-registration of a space object in accordance with the Registration Convention is to be taken as determinative of U.S. jurisdiction and control, absent an exception defined in § 105(a).⁷⁹ Absent an actual registration, the legislative history of 35 U.S.C. § 105 is relatively silent on what constitutes “jurisdiction or control” of the United States. Hence, it remains to be seen how this language will be interpreted by U.S. Courts.

Other phrases appearing in the language of 35 U.S.C. § 105 present some further areas ripe for discussion and debate. For example, 35 U.S.C. § 105 and its legislative history does not adequately address what is meant by the term “components” of a space object. The legislative history does state that “space object” is more expansive as compared to a “space vehicle” and “is used as defined in the [Registration Convention].”⁸⁰ Thus, it appears that the term “space object” was used to encompass satellites and the like as compared to being limited to human-rated transportation or supply vehicles. But, does the term “components” encompass integrated components of a space object; stand-alone components necessary for the operation and exclusive needs of a space object; any components carried on the space object (e.g., logistical supplies or stand-alone test devices); or all of the above? This question is not addressed in the legislative history of 35 U.S.C. § 105 and could form the basis for future litigation.

One of the few cases to examine the Inventions in Outer Space Act after its passage of 35 U.S.C. § 105 is *Hughes Aircraft Co. v. United States*.⁸¹ While determining that the Act had no “direct effect” to the outcome of the case because the launching activity had occurred before the Act’s passage, the Court noted

[t]he legislative history indicates that the purpose of the law was ‘to clarify U.S. patent law with respect to its extraterritorial application aboard U.S.-flag spacecraft, in order to encourage private investment in research and manufacture con-

⁷⁹ S. REP. NO. 266, 101st Cong. (1990) at 7.

⁸⁰ *Id.*

⁸¹ *Hughes Aircraft Co. v. United States*, 29 Fed. Cl. 197 (1993) [hereinafter *Hughes*].

ducted in outer space.'... Moreover, the legislative history suggests that the Act was consistent with international law.⁸²

After commenting on the inapplicability of 35 U.S.C. § 105, the Court in *Hughes* proceeded to address the issue of what constitutes "within the United States" as applied to technology designed for use on a satellite orbiting the Earth. *Hughes* owned a patent that claimed an apparatus for controlling the attitude of a spin-stabilized spacecraft. *Hughes* brought a 28 U.S.C. § 1498 action against the United States Government seeking compensation for the alleged use or manufacture by the United States Government "of spacecraft containing an embodiment of the patented apparatus." In its analysis of what constitutes "within the United States," the Court provided an interesting analysis relating to one particular satellite, *ARIEL 5*. *ARIEL 5* never entered the U.S.; was built in the United Kingdom (U.K.); was launched off the coast of Kenya by a team of Italian engineers from a U.S.-provided launch vehicle; and was primarily controlled from the U.K.⁸³ Absent a physical presence in the United States, the Court looked to whether there existed a *direct* control point in the United States. Tracking and data relay services were controlled from the U.S., but core satellite system monitoring and control were performed in the U.K. The Court ultimately found no "direct control" from the U.S. and, accordingly, no infringement by the U.S. Government by *ARIEL 5*. Thus, although the Court cited *Decca* and its "master station" arguments,⁸⁴ the Court used the language, "*direct* control" as opposed to simply "control." Whether or not "direct control" is equivalent to *Decca's* "master station" language is debatable. But, the key point in *Hughes* is that the Court essentially dropped two of the prongs in the *Decca* formula (i.e., the Court did not consider the ownership or beneficial use issues) for what constitutes "within the United States" and simply analyzed whether or not there existed "direct control."

⁸² *Id.* at 232

⁸³ *Id.* at 242.

⁸⁴ *Id.*

Based on the legislative history and judicial interpretation in *Hughes*, it is a safe bet that any future infringement claim against the U.S. based on the making, using, or selling of a patented invention in outer space will be invoke consideration of the extra-territorial reach of the U.S. Courts under the provisions of 35 USC § 105.

V. SPECIFIC EXEMPTIONS TO TERRITORIAL REACH-THE TEMPORARY PRESENCE DOCTRINE

Recall that 35 U.S.C. § 271(a) (the core of the U.S. Patent Act's statement on infringement) begins with the language “[e]xcept as otherwise provided in this title....” The Temporary Presence Doctrine is one such exception to patent infringement and is based on a principle that U.S. patent law does not apply to foreign flag vessels (e.g., an apparatus designed as a means of transportation or specifically, from a historical perspective, a sailing vessel) during temporary stays in the U.S. This doctrine can be traced back to the U.S. Supreme Court decision of *Brown*⁸⁵ and has found later support in the International Convention for the Protection of Industrial Property, to which the U.S. is a party. The doctrine is now codified at 35 U.S.C. § 272.⁸⁶

As given in § 272, the Temporary Presence Doctrine is limited to “use” of an invention;⁸⁷ requires that the state of registration must afford a similar privilege to U.S.-flag vessels, aircraft, or vehicles; requires a temporary presence in the U.S.; and requires that the invention is used exclusively for the needs of a vessel, aircraft, or vehicle. For outer space activities and specifically in regard to 35 U.S.C. § 272, a special definition for the

⁸⁵ See *Brown*, *supra* note 27.

⁸⁶ “The use of any invention in any vessel, aircraft or vehicle of any country which affords similar privileges to vessels, aircraft or vehicles of the United States, entering the United States temporarily or accidentally, shall not constitute infringement of any patent, if the invention is used exclusively for the needs of the vessel, aircraft or vehicle and is not offered for sale or sold in or used for the manufacture of anything to be sold in or exported from the United States.” 35 U.S.C. § 272.

⁸⁷ The *Hughes* court stated that launching a spacecraft (i.e., a satellite), containing an embodiment of a patented invention, in a U.S. launch vehicle from U.S. territory “by or for” the U.S. Federal Government constitutes “use” of that invention within the U.S. (*Hughes*, *supra* note 81).

word “vehicle” was added in 1981 to Title III, section 305 of the National Aeronautics and Space Act of 1958 [hereinafter Space Act], the implementing legislation that created NASA.⁸⁸ Specifically, section 305(k)⁸⁹ of the Space Act states that “[a]ny object intended for launch, launched, or assembled in outer space shall be considered a vehicle for the purpose of section 272 of title 35, United States Code.” This language greatly expands the definition of what constitutes a “vehicle” for purposes of 35 U.S.C. § 272 in reference to outer space activities. For example, the subject language would render cargo “launched ... in outer space” aboard the *Space Shuttle* (which is a classic example of what is commonly understood to be a space vehicle)⁹⁰ as also being a “vehicle.”⁹¹ Thus, an experimental kit, which uses a patented invention, launched by NASA onboard the *Space Shuttle* into outer space is arguably eligible for an infringement defense under 35 U.S.C. § 272.

Article 21 of the IGA implements a modified version of the traditional “Temporary Presence Doctrine” codified in the U.S. at 35 U.S.C. § 272. Article 21 states “[t]he temporary presence in the territory of a Partner State of any articles, including the *components* of a flight *element*, in transit between any place on Earth and any flight element of the Space Station registered by another Partner State or ESA shall not in itself form the basis for any proceedings in the first Partner State for patent infringement.”⁹² (emphasis added) Recall that 35 U.S.C. § 105(a) permits an exception to its expansion of territorial jurisdiction, i.e., what is “within the United States,” by negotiation of an international agreement to which the United States is a party.⁹³ Because the IGA represents an international agreement to

⁸⁸ National Aeronautics and Space Act of 1958, Pub. L. No. 85-568, 72 Stat. 426 (1958) (codified as amended at 42 U.S.C. § 2451 et seq. (2000)) [hereinafter Space Act].

⁸⁹ Now codified at 42 U.S.C. § 2457(k).

⁹⁰ Consider the language, “Any object ... launched in outer space ... shall be considered a vehicle for the purposes of [35 U.S.C. § 272].”

⁹¹ For an interesting discussion on the expansion of the definition of a “vehicle” vis-à-vis “cargo” in light of 42 U.S.C. § 2457(k), see *Hughes*, *supra* note 81.

⁹² IGA, *supra* note 16, at art. 21.6.

⁹³ See 35 U.S.C. § 105(a) (“... except with respect to any space object or component thereof that is ... otherwise provided for by an international agreement to which the United States is a party ...”).

which the United States is a party, the IGA can effectively define what constitutes U.S. territory for the purposes of U.S. patent law related to the making, using, or selling of a patented invention.

Both the Temporary Presence Doctrine defined in the IGA and the combination of 35 U.S.C. § 272 with section 305(k) of the Space Act arguably apply to cargo and are not limited to a “vessel, aircraft, or vehicle” transporting such cargo. However, the Temporary Presence Doctrine in the IGA differs from § 272 on one substantive issue. Specifically, the IGA’s Temporary Presence Doctrine is not limited to an invention’s “use”⁹⁴ for the exclusive needs of a vessel, aircraft, or vehicle. Thus, in accordance with the IGA, the mere transit (i.e., importation) of “any article, including components of a flight element” bound for the ISS through a Partner State on Earth or through a module registered by a Partner State would form the basis of a temporary presence defense against a possible infringement action. One can argue that the IGA’s Temporary Presence Doctrine is a defense to 35 U.S.C. § 271(a) via 35 U.S.C. § 105 based on the national jurisdictional principle expressed in the Outer Space Treaty as well as certain language in the legislative history of 35 U.S.C. § 105.⁹⁵ However, one can counter that the statutory activities defined in 35 U.S.C. § 105 are limited to the making, using, or selling of a patented invention and do not encompass the activity of “importation” into the U.S. Thus, this line of reasoning would conclude that the mere act of importing does not activate the provisions in 35 U.S.C. § 105, and consequently, the IGA’s Temporary Presence Doctrine is not available as a defense to a 35 U.S.C. § 271(a) infringement action.

⁹⁴ Compare the language found in 35 U.S.C. § 272, which is limited strictly to “use” of the invention, leaving open the question as to whether an invention, transported through the United States for delivery to Canada and thus “imported” into the United States, is also eligible for a temporary presence defense under 35 U.S.C. § 272.

⁹⁵ “Specifically, activities occurring on space objects under the jurisdiction and control of the United States are considered to have occurred in the United States; unless one of the two following exceptions [defined in 35 U.S.C. § 105] apply.” S. REP. NO. 101-266, 101st Cong. (1990), at 6.

VI. DESCRIPTION AND ANALYSIS OF SOME HYPOTHETICAL CASES CONCERNING PATENT RIGHTS IN SPACE

The following hypothetical cases have been prepared to examine and discuss the current state of extra-territorial reach of the courts to subject matter concerning patents:

Example 1. Consider the scenario wherein an Italian company manufactures a device in Italy and ships it to Kazakhstan for launch aboard a Russian *Progress* supply spacecraft. The device is not a registered space object because it is considered a flight element or more specifically, cargo. The device is bound for the *ISS* and will be exclusively used and controlled from an ESA module for the benefit of the Italian company. The claims of a valid U.S. patent “read on” the device. The *Progress* spacecraft docks with the *ISS* on a Russian module and is ultimately transferred to an ESA module by transporting it through the *U.S. Lab*. May the patentee sustain an infringement action in the U.S. courts against the Italian company by virtue of its transport through the *U.S. Lab*, based on the theory that the Italian device has been imported “into the United States”?

The answer is probably not. Under 35 U.S.C. §105, the invention must be “made, used or sold in outer space on a space object...under the jurisdiction or control of the United States” to be considered to be “made, used, or sold within the United States.” If the Italian device is only being transported through the *U.S. Lab*, the action of the Italian company cannot be considered to be a making, a use, nor a selling of the invention under 35 U.S.C. § 105 necessary to support a jurisdictional claim. Further, although article 21, Paragraph 2 of the IGA would seemingly expand U.S. territorial jurisdiction to any activity occurring within the *U.S. Lab* by providing that “an activity occurring in or on a Space Station flight element shall be deemed to have occurred only in the territory of the Partner State of that element's registry, except that for ESA-registered elements any European Partner State may deem the activity to have occurred within its territory,”⁹⁶ the IGA's temporary presence ex-

⁹⁶ See IGA, *supra* note 16, at art. 21.2.

ception found in paragraph 6⁹⁷ would, in all likelihood, prevent a U.S. Patentee from successfully arguing an infringement based on an “importation” claim, given the activity at issue is a mere transit of the device to the ESA module. Moreover, because the Italian device will be exclusively used and controlled from the ESA module (i.e., not from U.S. territory) for the benefit of the Italian company, a U.S. court is unlikely to consider the subject matter of this claim, nor the Italian company, to be of sufficient jurisdictional interest under any other theory such as one based on national jurisdiction or even one based on minimal contacts.

Example 2. Consider a patented process to capture solar energy wherein all claimed steps of the method are performed on a solar collection station on the Moon’s surface. The collection station is an unregistered stand-alone unit and is not integrated into a registered space object. The process is patented in the U.S. and the rights to the patent have been assigned to a small start-up company from India that has not licensed the invention. The process is being controlled from and supplies power to a U.S. registered space object (e.g., a lunar habitat module). The solar collection station is connected to the lunar habitat module via cables. Further, the collection station is owned and operated by a commercial U.S. entity. Given that land on the Moon is *res communis* and the process is not performed on a U.S. registered space object, does the use of the patented process on the Moon’s surface constitute an infringement in accordance with U.S. patent law?

In this example, the first question one should ask is whether or not the patented process associated with the collection station is “made, used, or sold in outer space on a space object or component thereof under the jurisdiction or control of the United States” under 35 U.S.C. §105(a). Because the collection station is itself an unregistered stand-alone unit, it must be determined whether the collection station is still considered to be

⁹⁷ *Id.* at art. 21.6 (“The temporary presence in the territory of a Partner State of any articles, including the components of a flight element, in transit between any place on Earth and any flight element of the Space Station registered by another Partner State or ESA shall not in itself form the basis for any proceedings in the first Partner State for patent infringement.”).

a “component” of the lunar habitat module that is registered. The analysis is further complicated by the lack of integration between the two structures. Would a court consider how integral (from an operational perspective) the collection station is to the habitat module? In this hypothetical, let us assume that the collection station is an important component for supplying critical power to the habitat module. Under this assumption, a court may conclude that a solar collection station would be a component of a space object (i.e., the habitat module) based on the close operational nexus between the collection station and the habitat module. Conversely, a drilling device for collecting lunar regolith samples (for research purposes) would *not* constitute a “component” of the habitat module under the same logic. Assuming *arguendo* that the collection station is a “component” of the U.S.-registered habitat module, then the patented process is “used in outer space” and would constitute U.S. territorial subject matter in accordance with 35 U.S.C. §105(a). Conversely, if the collection station is not considered a component of the habitat module, the next issue to address is whether or not the collection station, being owned and operated by a U.S. corporation, is otherwise under the jurisdictional authority of the United States. Because the collection station is operating on the Moon, a territory of *res communis*, it arguably is not under the jurisdictional authority of the United States under the territorial theory of *Brown* or *Deepsouth*, but could perhaps fall under the jurisdictional authority of the U.S. if the logic of *Gardiner* is followed. Further, even if “control” is interpreted to mean “operational” control, the collection station is not being operated by the U.S. Federal Government in this example. Thus, the guidance provided in the other extra-territorial cases discussed *supra* of *Decca*, *NTP*, and *Hughes* should also be considered. Applying *NTP*, because the patented invention is a process performed entirely on the Moon, there would likely be no infringement if the collection station is not determined to constitute U.S. territory. *Decca* and *Hughes* did not distinguish between apparatus (i.e., system) and method claims. Hence, if a court applies either (a) the three-prong test of *Decca* and finds U.S. ownership, control from the U.S., and beneficial use within the United States or (b) the direct control test of *Hughes* and

finds such direct control point in the U.S., a court could find infringement.⁹⁸

Example 3. Consider the same facts as in Example 2 with the exception that the patent claims read on the solar collection station (i.e., system claims). If the collection station is not determined to be a “component thereof” of a space object and not otherwise under the jurisdiction and control of the United States (i.e., not U.S. territory under 35 U.S.C. § 105), the situation becomes an extra-territorial scenario. First, assuming 35 U.S.C. § 105 does not apply to the collection station, 35 U.S.C. § 105 clearly applies to any invention made, used, or sold on the U.S. registered habitat module, wherein control and beneficial use takes place. Because the habitat module is a U.S.-registered space object, it in effect becomes U.S. territory under 35 U.S.C. § 105(a). Arguably, there would likely be an infringement due to the existence of U.S. ownership, control from the U.S., and beneficial use within the U.S. In other words, even if the collection station is not a “component thereof” of a U.S. space object and there is no jurisdiction or control of it by the United States, the collection station is nevertheless owned by a U.S. entity as well as controlled from and provides power to a U.S. registered space module, which *is* U.S. territory under 35 U.S.C. § 105(a) in that the invention is used by such module. The test in *Decca* requires all three of the above factors of ownership, control, and beneficial use. The test in *Hughes* requires “direct control” from the U.S. And the test in *NTP* requires control from the U.S. and beneficial use in the U.S. In sum, all tests seemingly would result in a determination of infringement under the facts of this example.

Example 4. Consider the scenario wherein a Japanese company manufactures a satellite scheduled to *commercially* launch from the U.S. (i.e., there is no international agreement to which the United States is a party). A U.S. patent’s claims read on the satellite’s communications subsystem and the U.S. Pat-

⁹⁸ The Court in *NTP* was the U.S. Court of Appeals for the Federal Circuit [hereinafter Federal Circuit]. Pursuant to 28 U.S.C. § 1295, the Federal Circuit has appellate jurisdiction over patent cases. Thus, arguably, the *NTP* tests would more likely be applied in a 35 U.S.C. § 271 patent infringement case.

entee has not licensed the invention to the Japanese company. The satellite and associated launch vehicle is registered as a Japanese space object in accordance with the Registration Convention. If the satellite is processed in the U.S.; launched from the U.S.; and even directly controlled from the U.S., does the use of the satellite constitute an infringement in accordance with U.S. patent law?

35 U.S.C. § 105(a) contains two exceptions. The first exception addresses international agreements. The second exception addresses registration under the Registration Convention. Because there is no international agreement to which the United States is a party, the first exception does not apply. However, because the satellite is registered as a Japanese space object, the second exception does apply. Therefore, under this scenario, even though the satellite is controlled from the U.S. as well as was launched from the U.S., the satellite would not constitute U.S. territory under the second exception defined in 35 U.S.C. § 105(a). Further, the Japanese company may argue a temporary presence defense under 35 U.S.C. § 272. The satellite is considered a "vehicle" within the meaning of 35 U.S.C. § 272 through section 305(k) of the Space Act. And, launching a satellite in a U.S. launch vehicle from U.S. territory may be interpreted by a court as constituting "use" within the U.S. in accordance with the "use" requirement of 35 U.S.C. § 272. However even if the second exception in 35 U.S.C. § 105(a) or the Temporary Presence Doctrine of 35 U.S.C. § 272 is applicable, extra-territorial rules and guidelines may also apply. The fact that the satellite is directly controlled from the U.S. could be argued by the Patentee that the temporary presence defense is inapplicable. Further, even if the satellite itself is determined to be Japanese territory, it is directly controlled from the U.S. And "direct control" was arguably a determinative factor under the *Hughes* decision. On the other hand, both *Decca* and *NTP* require more than "control" from the U.S. Thus, whether or not infringement exists in this scenario would depend largely on which court's holding is relied on for an extra-territorial determination in the event that the exception of 35 U.S.C. § 105 or the Temporary Presence Doctrine is not considered to control the disposition.

As highlighted by the case studies above, in light of technological advancements associated with extra-terrestrial exploration and commercialization, various fact patterns may emerge in the near-term that will likely have impacts on existing patent laws. Specifically, the combination of the *res communis* principle as applied to the Moon; the lack of a significant geographical separation of nations associated with registered space modules in close proximity to each other; and some ambiguous statutory language in regard to 35 U.S.C. § 105 increases the likelihood of legal uncertainty and future litigation.

VII. POSSIBLE MITIGATION TECHNIQUES

Given the existing legal landscape as applied to patent coverage in outer space, various mitigation techniques to avoid jurisdictional issues may be of particular interest. Mitigation techniques exist for both an inventor or patent owner as well as a potential infringer. Both perspectives will be addressed.

In terms of an inventor or owner of patent rights, if an invention has a commercial application in outer space, the inventor should first consider obtaining patent coverage in all existing and foreseeable space-faring nations. In doing so, the inventor can avoid the territorial complexities associated with the issues presented in this article. However, obtaining broad patent coverage in many different nations is a complicated, time-consuming, and expensive endeavor. Further, technological advancements may result in a commercial environment whereby launches and UN registration can occur from and in practically any nation on Earth. Thus, if an inventor decides to forego broad coverage and opts to obtain limited patent coverage, another possible mitigation technique is related to claim construction. For example, in regard to U.S. patent law, given the decision in *NTP* as it relates to method claims,⁹⁹ it would be beneficial for an inventor to emphasize apparatus (i.e., system) claims in a prospective patent application as opposed to just pursuing method claims. In other words, based on the decision in *NTP*,

⁹⁹ Recall that the *NTP* Court instituted a separate test for method claims. In a method claim, every step of the method must occur within the territory of the U.S.

apparatus claims have extra-territorial reach relative to infringement actions as compared to method claims, which do not. It is noted that emphasizing apparatus claims is a common practice in patent claim drafting because in many cases, apparatus claims are considered to have greater value than comparable method claims, in part because infringement acts associated with method claims are generally more difficult to identify and enforce.

In terms of a potential infringer, it would behoove one to perform an international search of patents utilizing the known elements and limitations of the potentially infringing device as search terms. The identification of national patent coverage may help one make decisions associated with where to manufacture, launch, and possibly register a potential infringing device. Further, an infringement analysis by a competent attorney may help in identifying differences between the patented device and the potentially infringing one to permit a "design around" as well as potential risks, which can be used by a potential infringer to make informed business decisions. Such business decisions may include obtaining a license from the one or more patent owners of concern.

VIII. CONCLUSION

The environment associated with outer space activities is changing. At the time of publication of this article, governmental activities arguably dominate outer space endeavors, especially in the context of a human presence in outer space. However, it is entirely foreseeable that commercial projects in outer space will greatly increase in the near term, particularly in regard to activities in low-earth orbit [hereinafter LEO]. In fact, a human presence in LEO financed with private funds is likely in the next decade. Further, it is probable that commercial research and development activities on-board the *ISS* will dramatically increase and could form the foundation for funding the U.S. portion in regards to maintenance and operational costs of the *ISS*. The *ISS* will continue to provide an international platform for human exploration of outer space that should continue on to a return to the Moon. However, the environment

for outer space activities may change from being led by actors that are predominantly governmental to private commercial entities.

In addition to this paradigm shift, the relative proximity of space objects, registered under different nations, has the potential to strain existing patent law and the territorial nature to which it is based upon. With particular reference to U.S. patent law, lingering questions on the subject of patent infringement remain due to the intricate political web of international treaties and agreements, the use of certain ambiguous terms contained in 35 U.S.C. § 105, and the existence of judicial restraint in determining what constitutes subject matter “within the United States” for technologies that cross territorial borders.

The courts will have additional opportunities to tell us how patent infringement issues for future activities in outer space will be resolved. If history is any indication, it would appear that courts will continue to address the jurisdictional issue of extra-territorial reach as a mixed question of policy, fact, and law to be determined on a case-by-case basis.

SPACE ACT AGREEMENTS: A PRACTITIONER'S GUIDE

*David S. Schuman**

I. INTRODUCTION

At NASA we have the best clients in the world, all with impossibly difficult jobs.¹ Depending on whom you ask, NASA's mission is to return human beings to the Moon, explore Mars, complete the *International Space Station*, determine whether life exists elsewhere, investigate the forces affecting global climate change, and characterize the size, structure, and ultimate fate of the universe. For lawyers serving the highly talented scientists, engineers, and managers working on these non-trivial problems within this great Agency, it is easy to say what the rules are, and what they cannot do. Statutes, regulations, and directives are easy to find. But the best lawyers see the bigger picture, recognize what the client is trying to do, and figure out a flexible and creative path to get there. We don't say just what the law is, we try to figure out how we can use the legal tools available to help our clients achieve their goals.

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¹ While it certainly doesn't happen every day, the author traveled to Stockholm, Sweden, in December 2006, to watch one of his clients present the Nobel Prize lecture, following the announcement he was the co-recipient of the 2006 Nobel Prize in Physics for his work on the *Cosmic Background Explorer (COBE)* satellite, developed at NASA's Goddard Space Flight Center. *COBE* measured the blackbody form and anisotropy (hot and cold spots) of the cosmic microwave background radiation, evidence leftover from the formation of the universe. Noted physicist Stephen Hawking, once called the result "the greatest discovery of the century, if not of all time." See JOHN C. MATHER & JOHN BOSLOUGH, *THE VERY FIRST LIGHT* 253 (1996). Dr. Mather's 2006 banquet speech contains a beautiful and succinct version of our attempt to understand the universe through the study of light. See John C. Mather, Nobel Prize winner in Physics, 2006, Banquet Speech (Dec. 10, 2006), http://nobelprize.org/nobel_prizes/physics/laureates/2006/mather-speech_en.html.

There's no better tool, no more flexible and creative tool, than the Space Act (hereinafter the Act).²

Through the exhaustive research, creative energy, and dogged initiative of Paul Dembling, General Counsel of the National Advisory Committee for Aeronautics (NACA)³ more than 50 years ago, NASA was provided with a powerful and comprehensive organic statute. While it has many interesting provisions,⁴ some provided in later years, there is widespread appreciation that the most useful among them is NASA's "other transactions" authority (hereinafter OTA).⁵ The story of how the OTA came about is a rich and fascinating one best told by the author of that language, elsewhere in this issue of the JOURNAL OF SPACE LAW.⁶ It would be no exaggeration to state that since the authority was enacted, NASA lawyers have used it to help our clients achieve their mission thousands of times. We use it every day.

² The National Aeronautics and Space Act of 1958, as amended, 42 U.S.C. § 2451, et seq.

³ Later Mr. Dembling served as NASA's General Counsel and General Counsel to the General Accounting Office [now Government Accountability Office (GAO)], followed by a 25-year partnership at the law firm of Schnader, Harrison, Segal & Lewis.

⁴ Some of the more important provisions state (a) that the policy of the United States is that activities in space "should be devoted to peaceful purposes for the benefit of all mankind," (b) that NASA should "seek and encourage, to the maximum extent possible, the fullest commercial use of space," (c) that the NASA Administrator "shall be appointed from civilian life," (d) that NASA must provide for the "widest practicable and appropriate dissemination of information concerning its activities," (e) that the Agency may accept "unconditional gifts," (f) that concessionaires may operate the Agency's visitor centers, (g) that NASA may provide insurance and indemnification in certain situations, and (h) most recently, that the Agency may enter into enhanced-use leases concerning its real property. 42 U.S.C.A. §§ 2451-2473 (2003 and Supp. 2008).

⁵ 42 U.S.C.A. § 2473(c)(5) (2003 and Supp. 2008).

⁶ Paul G. Dembling, *The National Aeronautics and Space Act of 1958: Revisited*, 34 (2) J. SPACE L. 203 (2008). Mr. Dembling once recounted for the author some of the details concerning formation of the Space Act. Several of the most interesting aspects include the perceived jurisdictional competition from the military departments, his request to Dr. Hugh Dryden, the head of NACA, that he be allowed to draft some legislation for the new agency, the advantage obtained from providing a first draft of that legislation ("Washington operates on the first draft it gets."), his review of every published GAO decision on the extent of agencies' authority, and his description of how the OTA came about. Telephone Interview with Paul G. Dembling (July 25, 2002) (transcript available upon request).

II. SPACE ACT AGREEMENTS GENERALLY

The Act provides NASA with the ability to

enter into and perform such contracts, leases, cooperative agreements, or *other transactions* as may be necessary in the conduct of its work and on such terms as it may deem appropriate, with any agency or instrumentality of the United States, or with any State, Territory, or possession, or with any political subdivision thereof, or with any person, firm, association, corporation, or educational institution.⁷

This key phrase provides NASA with tremendous flexibility to accomplish its goals. Countless Federal government agencies have the ability to enter into contracts, grants, and cooperative agreements, but not all enjoy the OTA.⁸

The Federal Grant and Cooperative Agreement Act⁹ specifies when the Federal Government should use each particular type of legal instrument. In general, when the principal purpose of the instrument is to acquire property or services for the direct benefit or use of the United States Government, agencies must use a procurement contract.¹⁰ Executive Branch agencies use grants when the principal purpose of the relationship is to transfer a thing of value to carry out a public purpose of support or stimulation and substantial involvement with the partner is not expected.¹¹ When the Government does so and substantial involvement is expected, it uses a cooperative agreement.¹²

The Federal Acquisition Regulation (FAR) provides a well-understood framework for conducting a Federal procurement. Those rules are supplemented by the NASA Federal Acquisition

⁷ 42 U.S.C.A. § 2473(c)(5) (emphasis added).

⁸ GAO has recognized that, since 1958, Congress has extended the authority to use “other transactions” to a number of other Federal agencies, including the Department of Defense [10 U.S.C.A. § 2371 (1998)], the Department of Homeland Security [6 U.S.C.A. § 391 (2007 and Supp. 2008)], the Department of Energy [42 U.S.C.A. § 7256(g)(1) (Supp. 2008)], and the Department of Transportation [49 U.S.C.A. § 106(l) (2007)]. Matter of Exploration Partners, LLC, B-298804, 2006 CPD 201, at 4, n.1 (2006) [hereinafter *Partners*], <http://www.gao.gov/decisions/bidpro/298804.pdf>.

⁹ 31 U.S.C.A. §§ 6301-6308 (2003).

¹⁰ 31 U.S.C.A. § 6303 (2003).

¹¹ 31 U.S.C.A. § 6304 (2003).

¹² 31 U.S.C.A. § 6305 (2003).

Regulation Supplement. In combination, these regulations impose a wide range of requirements on the Agency when it acquires goods or services, including the need for advertising, competition, source selection, implementation of socio-economic goals, and contract administration. The rules also provide a well understood framework for challenging NASA contract awards both before the Agency and GAO. While many of our clients might like it to be otherwise, acquisition efficiency is not one of the chief characteristics of this regulatory environment.

By contrast, Space Act agreements (hereinafter SAAs), are not procurements and are not subject to this framework. As such, when the factual environment supports the use of such agreements, they can be developed and executed quickly, on both an exclusive and non-exclusive basis, in response to an Agency request or an unsolicited proposal, and on a reimbursable or non-reimbursable basis. They are not, however, a substitute for procurements conducted under the FAR when the Agency is acquiring goods or services for its direct benefit. As attorneys, we are sometimes called upon to convey this message to clients, or outside entities, who believe the Act can be used to avoid a statutory and regulatory framework, or to accomplish an acquisition objective more quickly.

SAAs are most suited to the accomplishment of mutually agreeable goals within the Agency's mission. Examples include partnerships with other Federal agencies, State and local governments, educational institutions, for profit companies, and not-for-profit entities. One of the most common uses is provision of NASA facilities¹³ on a non-interference basis to allow technological or scientific development, such as use of Agency wind tunnels at Langley Research Center and Ames Research Center, or use of thermal-vacuum test chambers at Goddard Space Flight Center, or Johnson Space Center. NASA facilities are often unique, due to size, capability, or location, such that opportunities for similar work outside the Agency do not exist. Hence, outside entities often need and seek out such capability from NASA. Indeed, one of the few constraints on development

¹³ Another common use is provision of NASA personnel with unique knowledge, capabilities, and skills.

of SAAs for use of NASA facilities is the prohibition on Government competition with the private sector in provision of facilities or equipment.¹⁴

III. SPACE ACT AGREEMENT POLICY AND EXECUTION

In years past, because there was no established procedure for creating, negotiating, and executing SAAs, the process was often time and resource intensive. Today, the Agency employs an efficient computer based program called Space Act Agreement Maker (SAAM).¹⁵ Following entry of correct factual information into the system by the client, assisted by an agreements manager, SAAM automatically generates the first draft of an agreement containing appropriate provisions. This ensures that all statutory and regulatory requirements are included and, analogous to the use of FAR clauses in a procurement contract, provides a measure of reassurance to reviewing Agency attorneys. Drafts generated by SAAM may then be individually tailored to include any situation specific facts and provisions. Provided both NASA and its outside entity have a good understanding of the arrangement, participate in good faith in early and comprehensive discussions both before and after generation of the first draft, the SAAM process can lead to formation and signature of final agreements within weeks. This is a great benefit to both sides. SAAM also allows for the archiving, search, and retrieval of existing agreements.

NASA Policy Directive (NPD) 1050.1H provides the regulatory framework for reimbursable, non-reimbursable, and funded SAAs.¹⁶ The NPD defines each type of agreement, indicates which issues must be addressed in every agreement, and specifies which individuals have authority for signing agreements on

¹⁴ The Commercial Space Competitiveness Act indicates the Government may allow non-Federal entities to use space-related facilities on a reimbursable basis if, amongst other things, "equivalent commercial services are not available on reasonable terms." 15 U.S.C.A. § 5807 (1998).

¹⁵ SAAM is currently accessible by registered internal NASA users.

¹⁶ See NASA Policy Directive, *Subject: Authority to Enter into Space Act Agreements*, NPD 1050.1H (Nov. 29, 2006), available at <http://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPD&c=1050&s=1H>.

behalf of the Agency.¹⁷ Reimbursable SAAs are those wherein NASA's costs associated with the undertaking are reimbursed by the Agreement partner in whole or in part.¹⁸ Nonreimbursable SAAs involve NASA and one or more partners in a mutually beneficial activity that furthers an Agency mission, wherein each party bears the cost of its participation and there is no exchange of funds between the parties.¹⁹ Funded SAAs are those under which NASA transfers appropriated funds to a domestic partner to accomplish an Agency mission.²⁰

Some of the more important areas that must be covered in an agreement include (1) respective responsibilities of the parties, (2) responsibilities or performance mile-stones, (3) clearly defined financial commitments (if any), including a statement that NASA's performance of the Agreement is subject to the availability of appropriated funds and that no provision of the Agreement shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act,²¹ (4) resource commitments, providing that NASA usage of facilities, equipment, and personnel shall have priority, (5) allocation of risk between the parties, (6) allocation of intellectual property rights, (7) termination rights and obligations, and (8) a fixed expiration date.²²

Based on the wealth of previously executed SAAs, and experience interpreting issues arising under various provisions contained in those agreements, NASA has also prepared the "Space Act Agreements Guide," (the Guide) administered by the Office of General Counsel at NASA Headquarters.²³ The Guide is intended to explain NASA agreement practice and provide assistance to those involved in formation and execution of SAAs.

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ *Id.*

²¹ 31 U.S.C.A. § 1341 (2003).

²² *Authority to Enter into Space Act Agreements*, *supra* note 16.

²³ See NASA Advisory Implementing Instruction, *Space Act Agreements Guide*, NAI 1050-1A, effective August 15, 2008, available at http://nodis3.gsfc.nasa.gov/NPD_attachments/NAI1_1050_1A.doc.

It does not, in and of itself, establish substantive or procedural requirements contained in other authorities.

IV. EXAMPLES

NASA has used its OTA for a wide variety of innovative and useful purposes. Beginning in 2001, NASA entered into a number of non-reimbursable SAAs with Bigelow Aerospace (hereinafter BA) for collaboration, technical and short-term personnel exchanges, as well as licensing agreements involving payment of royalties. BA is developing a line of inflatable orbital space habitats based on NASA patented technology which, if successful, will help fulfill NASA's charter "to encourage to the maximum extent possible the fullest commercial use of space,"²⁴ and help the Agency to achieve its own long-term goals of establishing a human presence on the Moon and Mars. In addition to its original financial investment in facilities and personnel, BA has paid for the launch of two sub-scale demonstrators. JSC engineers who participate in interactions with BA gain insight into state of the art capabilities concerning the development, launch, control, and operations of expandable space structures. The arrangements promise to be very much a win-win situation for both sides.

Other examples include routine SAAs at Langley Research Center for support to the aerospace industry, such as blended wing body and fighter aircraft research, as well as air traffic control. More unusual agreements support (1) collaboration with Jamestown 2007, planners of the commemoration of the 400th anniversary of the landing at Jamestown, Virginia, to develop educational resources, exhibits, and support materials focusing on themes of exploration past, present, and future, (2) reimbursable wind-tunnel work testing the surface friction of more than 60 types of fabric to help develop the "world's fastest swimsuit" used in the summer Olympic games in Beijing,²⁵ and

²⁴ See 42 U.S.C.A. § 2473(a)(3) (2003).

²⁵ In August 2008, swimmer Michael Phelps used Speedo's LZR Racer while winning eight Olympic gold medals and setting seven world records. For more information see, NASA News & Features, *Olympic Swimmers Shattering Records in NASA-Tested*

(3) reimbursable work for the filming of major motion pictures, that has occurred at several NASA centers.

Besides the OTA under the Act, NASA has also taken advantage of its newly provided authority under the enhanced use lease demonstration program.²⁶ That legislation allowed the Agency to lease out underutilized real property at fair market value and retain proceeds obtained from the lessee. Ames Research Center and Kennedy Space Center have entered into a variety of enhanced use leases bringing to their respective campuses other Governmental agencies, universities, and private parties. As one example, Ames entered into an enhanced use lease with the Air Force of the National Full-Scale Aerodynamics Complex (NFAC), a facility consisting of the 40 x 80 foot and 80 x 120 foot wind tunnels. The NFAC was underutilized by NASA and there was insufficient funding to preserve, operate, and upgrade the facility. The lease with the Air Force allowed cost recovery authorized by the statute, which preserved this national asset for the benefit of the country. Ames currently has leases with 14 universities and approximately 40 private companies.²⁷

V. FUNDED SPACE ACT AGREEMENTS

In certain circumstances, SAAs can be used to provide funding to an outside partner. NASA recently developed funded SAAs with for-profit companies to implement Phase One of the Commercial Orbital Transportation Services (hereinafter, COTS) project. In accordance with United States Space Exploration Policy, NASA must complete assembly of the *Internation-*

Suit (Aug. 13, 2008), <http://www.nasa.gov/topics/technology/features/2008-0813-swimsuit.html>.

²⁶ 42 U.S.C.A. § 2459j (2003 and Supp. 2008).

²⁷ Enhanced use leases can be a significant means of leveraging the value of an agency's real property and facilities. As NASA struggles with its portfolio of aging infrastructure, coupled with insufficient resources for construction of new facilities, such leveraging could be important. In addition to the OTA and enhanced use leasing authority under the Space Act, the Agency may also use the National Historic Preservation Act (NHPA) for this purpose. 16 U.S.C. §§ 461-470x-6 (2000 and Supp. 2008). Proceeds of leases under the NHPA may also be retained by the Agency and used to "defray the costs of administration, maintenance, repair, and related expenses" of properties on the National Register of Historic Places. 16 U.S.C. § 470h-3(b) (2000).

tional Space Station (ISS), planned for the end of the decade, using the *Space Shuttle* and then retire the *Shuttle*.²⁸ Once the *Space Shuttle* is retired, the Russian *Soyuz* vehicle will be the only one available for crew exchange and rescue services on the *ISS* until the *Orion* spacecraft or a United States commercially provided crew service is available.²⁹ United States space policy directs the purchase of commercially available U.S. space transportation products and services to the maximum extent possible, consistent with mission requirements and applicable law.³⁰ NASA's policy is to employ U.S. commercial services for both cargo and crew exchange at the earliest available opportunity, while minimizing the technical risks of interrupting the U.S. crew presence on orbit, or leaving the *ISS* in a state of disrepair because failed components cannot be replaced.³¹ To this end, NASA is investing \$500 million to stimulate the commercial space industry and to facilitate U.S. industry demonstration of commercial space transportation capabilities under Phase One of the COTS project.³² Phase Two of the COTS project is a planned competitive procurement of orbital transportation services to resupply the *ISS* with crew and cargo.

NASA's application of the OTA in support of the COTS project was fully explored recently before GAO. While many had always believed that one of the most useful characteristics of SAAs using the OTA is that such agreements are not subject to protest since they are not procurements, that view was tested and reinforced in two GAO decisions examining the COTS project.³³

²⁸ See United States Space Transportation Policy, Fact Sheet (Jan. 6, 2005), available at http://www.ostp.gov/galleries/Issues/Space_Transportation_Policy05.pdf.

²⁹ See Statement of Michael D. Griffin, Administrator, National Aeronautics and Space Administration, before the Subcommittee on Space, Aeronautics, and Related Sciences, of the Commerce, Science, and Transportation Committee of the United States Senate, (Nov. 15, 2007) [hereinafter Statement], available at http://commerce.senate.gov/public/_files/CopyofNASAISSTransportationTestimonyRevdFINAL.pdf.

³⁰ See United States Space Transportation Policy, *supra* note 28.

³¹ See Statement, *supra*, note 29.

³² *Id.*

³³ *Partners*, *supra* note 8; Matter of Rocketplane Kistler, B-310741, 2008 CPD ¶22 (2008) [hereinafter *Rocketplane*].

In the first case, Exploration Partners challenged NASA's decision to provide funded SAAs totaling \$500 million over a four-year period to Space Exploration Technologies (SpaceX) and Rocketplane Kistler under the COTS project.³⁴ GAO recounted NASA's decision to carryout the project in two phases, the first being a "period of development and demonstration by private industry, in coordination with NASA, of various space transportation capabilities . . . determined to be most desirable for the Government and other customers."³⁵ Phase Two was described as a "potential competitive procurement of orbital transportation services to resupply the [ISS] with cargo and crew, if a capability is successfully demonstrated and the Government determines it is in its best interests."³⁶ Each agreement was characterized by performance milestones proposed by the participants and negotiated with NASA.³⁷ NASA's contribution was a fixed amount regardless of each participant's ability to raise additional private funding.³⁸ Exploration Partners claimed it was "the only company that offered a fully funded end-to-end transportation system" and should have received an agreement or, in the alternative, that the "COTS program"³⁹ . . . be re-bid under the original terms and conditions without interference in obtaining Shuttle hardware, cost data or interference in commercial business relationships."⁴⁰

GAO concluded that under the Competition in Contracting Act of 1984 and its own bid protest regulations, it would not review issuance of SAAs pursuant to NASA's OTA because the issuance of such agreements was not tantamount to the award of contracts for the procurement of goods and services and was, therefore, outside GAO's bid protest jurisdiction.⁴¹ GAO noted that the Act did not define other transactions but that Congress

³⁴ *Partners, LLC*, *supra* note 8, at 2.

³⁵ *Id.*

³⁶ *Id.*

³⁷ *Id.*

³⁸ *Id.*

³⁹ NASA is carrying out the COTS *project* under the Commercial Crew and Cargo Program. See NASA, *Commercial Crew & Cargo*, available at <http://www.nasa.gov/offices/c3po/home/index.html> (last visited Nov. 13, 2008).

⁴⁰ *Partners*, *supra* note 8, at 3.

⁴¹ *Id.* at 4.

had recognized at the time of its promulgation that this was a grant of “broad authority.”⁴² In reaching this conclusion, GAO applied the rule of statutory construction that indicates a statute ought to be so construed that, if it can be prevented, no clause, sentence, or word shall be superfluous, void, or insignificant.⁴³ GAO noted that Exploration Partners had not timely challenged NASA’s original decision to award SAAs since such a challenge was required to be filed before the closing date set for receipt of proposals.⁴⁴

In the second case, Rocketplane Kistler challenged NASA’s decision to continue Phase One development of the COTS program with a second round of funded SAAs with industry.⁴⁵ NASA announced it was soliciting proposals for demonstrations involving an end-to-end transportation system of services including ground operations and integration, launch, rendezvous, proximity operations, docking or berthing, orbital operations reentry, and safe disposal or return.⁴⁶ Participants were informed they were expected to secure funding necessary to complete the proposed capability demonstration, but funding could include up to \$174 million from NASA.⁴⁷ Payments would be made on completion of performance milestones.⁴⁸ Rocketplane argued that the principal purpose of the announcement is to obtain research and development services for the direct benefit of NASA and that NASA was required to use a procurement contract.⁴⁹

NASA argued that, through the agreements, it obtained no vehicles, supply service, prototype, hardware, or other property, no systems or vehicle designs, and only the minimum Government-purpose data rights legally required by the Act.⁵⁰ The announcement did not provide NASA any right to future use of

⁴² *Id.*

⁴³ *Id.*

⁴⁴ *Id.* at 6.

⁴⁵ *Rocketplane*, *supra* note 33, at 1-2.

⁴⁶ *Id.* at 2.

⁴⁷ *Id.* at 2-3.

⁴⁸ *Id.* at 3.

⁴⁹ *Id.*

⁵⁰ *Id.* at 4.

systems and vehicles developed and demonstrated.⁵¹ The participant proposed the capabilities it would demonstrate and established the technical and schedule milestones for the demonstrations.⁵² GAO noted that the announcement here sought to “incentivize the private sector to develop and demonstrate their own commercial technologies.”⁵³ GAO concluded the announcement did not principally provide for the acquisition of goods and services for the direct benefit and use of NASA.⁵⁴ Rather the record supported the agency’s arguments that the principal purpose of the announcement was to encourage, support and stimulate the development of a commercial market for space transportation, from which NASA could potentially acquire orbital transportation services.⁵⁵

VI. CONCLUSION

Practical and strategic benefits aside, perhaps the most important aspects of the Act are intangible. NASA’s ability to partner with outside entities can facilitate the co-location and interaction of intellectual talent. Close physical collaboration provides the potential for the promotion and development of unexpected scientific and technological innovations, important goals for an Agency charged with opening up the solar system. Also less obvious is the creation of a vibrant and creative work environment conducive to the attraction of a talented workforce, in particular for employees contemplating new careers. The best work force is often attracted to state-of-the-art facilities and exciting projects, not necessarily achievable through other means.

When the chief architect of the Act was once asked how the phrase, “other transactions,” came about, he replied,

Well, I tried to cover everything else that was [raised by others]. When somebody said, well, suppose we have this kind of

⁵¹ *Id.*

⁵² *Id.*

⁵³ *Id.* at 4-5.

⁵⁴ *Id.* at 5.

⁵⁵ *Id.* NASA subsequently entered into a funded SAA with Orbital Sciences Corporation to conduct Phase One of the COTS project.

a transaction or that kind of a transaction, I figured, it may not be covered under contracts, leases, and cooperative agreements. I couldn't think of any other terminology to use, so I used "other transactions as may be determined or necessary in the conduct of its work." So it was a sort of catchall phrase that I tried to use. . . . [A]n "other transaction" is not a procurement contract, cooperative agreement, or grant and, therefore, is *not subject to the laws, regulations, and other requirements applicable to such contracts, agreements, and grants. It is this flexibility which provides authority to structure agreements in accordance with standard business practices.*⁵⁶

NASA's current use of that implementing language, drafted more than fifty years ago, and reinforced by recent GAO decisions, constitutes a lasting legacy to that legislative prowess.

⁵⁶ Telephone Interview with Paul G. Dembling (July 25, 2002) (transcript on file with author) (emphasis added).

REFLECTIONS UPON THE NOTION OF LIABILITY: THE INSTANCES OF *KOSMOS* 954 AND SPACE DEBRIS

*Andrew Brearley**

INTRODUCTION

This piece seeks to examine the principles of space law and how they could potentially be applied to the present problem of space debris.¹ In order to do so it conducts an inquiry into the events surrounding the crash of a nuclear powered satellite into Canadian territory. The incident has now been largely forgotten, although occasional references to it appear in popular Canadian culture,² but it remains the most useful instance in which the liability provisions of space law have been tested.

The United Nations Office of Outer Space Affairs (OOSA) highlights two specific security issues which affect humanity's activities in space: the use of nuclear power and space debris. Although it is debris which currently raises the greatest concerns, the use of nuclear power has resulted in the testing of the notion of liability as it is contained within space law.

The two issues present different legal and technical challenges, principally due to the locations in which they pose a danger. Debris may be a threat on the ground should it survive re-entry to the atmosphere, however this threat is negligible in

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¹ Space debris, or orbital debris, is defined as artificial objects trapped in Earth orbit. Due to the extreme speed at which they travel they are considered to pose a serious threat to active space projects. See NICHOLAS L. JOHNSON & DARREN S. MCKNIGHT; *ARTIFICIAL SPACE DEBRIS* (Krieger Publishing Company, 1991); *Technical Report on Space Debris* (New York: United Nations, 1999), www.unoosa.org/pdf/reports/ac105/AC105_720E.pdf.

² See e.g., DOUGLAS COUPLAND, *ELEANOR RIGBY* 192 (London, Harper Perennial, 2005) (a character discovers a piece of radioactive debris in Canada from a Soviet era nuclear powered satellite).

comparison to the risk which it poses in orbit. In contrast nuclear power sources pose the greatest concern on ground level. Legally the two problems have to be considered separately as a differing degree of liability exists depending upon where an incident occurs. A further differentiation between the two problems concerns remedial action, addressing one problem can have a detrimental effect with reference to the other.

In a typical year more than fifty large objects fall back to the Earth from orbit.³ Simply due to the geography of the Earth the majority of objects, both natural and artificial, that enter the atmosphere, and survive the process of re-entry, land in the oceans.⁴ Larger objects, such as the Soviet *MIR* space station, re-enter the atmosphere in a controlled fashion, and what remains of the object after "burning-up" is deliberately targeted at the high seas. However, such instances demonstrate that remedial action towards the debris problem in orbit, specifically bringing large objects back into the atmosphere, can result in physical danger being caused on the surface of the planet.

Almost five decades of space travel have produced few instances of damage being caused by objects returning from space. However, the presence of debris in Earth orbit creates the increased possibility of the Liability Convention⁵ being used as a means to resolve international disputes. Despite having been in effect for several decades, the treaty is largely untested. However, it was exercised, although not to its full extent, in a case between the USSR and Canada.

BACKGROUND TO THE CLAIM

On January 24, 1978 a Soviet satellite, *Kosmos 954*,⁶ accidentally crashed into north western Canada. The fragmented parts of the satellite were scattered over an area the size of Aus-

³ M. Yakovlev; *The "IADC Space Debris Mitigation Guidelines" and Supporting Documents*, in PROCEEDINGS OF THE 4TH EUROPEAN CONFERENCE ON SPACE DEBRIS 595 (Darmstadt, Germany: European Space Agency, 2005).

⁴ S. Neil Hosenball, *Nuclear Power Sources In Outer Space*, 6(2) J. OF SPACE L. 119 (1978).

⁵ Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 28 U.S.T. 2389, T.I.A.S. No. 7762 [hereinafter Liability Convention].

⁶ The satellite is also often referred to as "Cosmos 954".

tria,⁷ and included some of its power source, 30 kilograms of enriched uranium.⁸ These events, and the subsequent claim for damages, made by the government of Canada, provide an insight into the notion of liability as it is contained within space law, revealing difficulties inherent in its application.

Kosmos 954 was launched on September 18, 1977.⁹ The Convention on Registration of Objects Launched into Outer Space,¹⁰ requires that every object “launched into Earth orbit or beyond” is registered with the Secretary-General of the United Nations, and that a registry shall be maintained of all such objects,¹¹ this is to include the “[g]eneral function of the space object.”¹² The purpose of the treaty is to create a mandatory international database which would “assist in their identification and would contribute to the application and development of in-

⁷ U.S. Congress, Office of Technological Assessment, *Orbiting Debris, A Space Environmental Problem - Background Paper*, 3 (Washington D.C.: U.S. Government Printing Office, 1990).

⁸ Nicholas L. Johnson, *Monitoring and Controlling Debris in Space*, SCIENTIFIC AMERICAN, 64 (Aug. 1998).

⁹ See Committee on the Peaceful Uses of Outer Space, Information Furnished in Conformity with General Assembly Resolution 1721 B (XVI) by States Launching Objects into Orbit or Beyond, U.N. Doc. A/AC.105/INF.368 (Nov. 22, 1977) [hereinafter Information Furnished in Conformity with GA Res 1721 B (XVI)], <http://www.unoosa.org/pdf/inf368E.pdf>; Committee on the Peaceful Uses of Outer Space, Note Verbale Dated 3 March 1978 From the Permanent Representative of Canada Addressed to the Secretary-General, U.N. Doc. A/AC.105/217 (Mar. 6, 1978) [hereinafter Note Verbale Dated 3 March 1978], http://www.unoosa.org/pdf/reports/ac105/AC105_217E.pdf; and Committee on the Peaceful Uses of Outer Space, Note Verbale Dated 19 December 1978 from the Permanent Representative of Canada to the United Nations Addressed to the Secretary-General, U.N. Doc. A/AC.105/236 (Dec. 22, 1978) [hereinafter Note Verbale Dated 19 December 1978], http://www.unoosa.org/pdf/reports/ac105/AC105_236E.pdf.

This document was submitted to the United Nations in accordance with the Convention on Registration of Objects Launched into Outer Space, which commits states to register objects which are launched into space with the Secretary General of the United Nations. See Convention on Registration of Objects Launched into Outer Space, Sep. 15, 1976, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter Registration Convention]. An initial press report of the launch, before the satellite crashed, quoted the launch date as 19th September. See, *Soviets Launch New Salyut*, AVIATION WEEK & SPACE TECHNOLOGY (Oct. 3, 1977).

¹⁰ Registration Convention, *supra* note 9.

¹¹ *Id.* at art. II, para. 1.

¹² *Id.* at art. IV, para. 1.

ternational law governing the exploration and use of outer space.”¹³

In respect of this treaty, the Soviet government recorded the launch with the Secretary-General, declaring its purpose as “[i]nvestigation of the upper atmosphere and outer space.”¹⁴ However, *Kosmos 954* and its sister satellites were, in fact, designed for surveillance of marine vessels.¹⁵ This role inevitably made them subject to potential accidents. In order to monitor ships they sought to bounce active radar signals off the target vessel; to do this effectively they needed to remain in a low orbit, as moving twice as far away from the target reduces the strength of such signals to a sixteenth of their initial intensity. Therefore, the satellites were placed only 150 miles from the surface of the planet, just above the point where atmospheric drag would prevent orbit from being sustained.¹⁶ At such a low altitude there is an increased risk of the craft re-entering the atmosphere should it encounter a problem. Moreover, in low orbits, solar cells cannot be used as a power source, as they would create too much drag, therefore a small nuclear reactor powered the satellite.¹⁷

The Soviet Union perceived other advantages in utilising a nuclear power source, specifically it increased the operational efficiency of the satellite and improved the weight and size characteristics.¹⁸ Yet these advantages were accompanied by the inherent risk of atomic energy, should an accident occur. It is important to consider that in orbit a nuclear power source does not pose a significant radiation threat. There is no organic life in space. Further, the Sun itself produces large amounts of radiation. The danger is posed either through an accident at

¹³ *Id.* at Preamble.

¹⁴ Information Furnished in Conformity with GA Res 1721 B (XVI), *supra* note 9.

¹⁵ John Lawrence, *Nuclear Power Source in Space a Historical Review*, NUCLEAR NEWS (Nov. 1991).

¹⁶ *Return of the native. (space junk)*, THE ECONOMIST (Oct. 1, 1988), http://findarticles.com/p/articles/mi_hb5037/is_/ai_n18322503.

¹⁷ *Id.*

¹⁸ These aspects were explained by the Soviet delegate Boris Maiorski to the U.N. Committee on the Peaceful Uses of Outer Space. See Eilene Galloway, *Nuclear Powered Satellites: The U.S.S.R. Cosmos 954 and the Canadian Claim*, 12(3) AKRON L. REV. 406 (Winter 1979).

launch or due to re-entry into the eco-system. Due to such potential dangers, at the end of their operational life time the *Kosmos* surveillance satellites were raised to a higher orbit where there was little danger of re-entry.¹⁹ *Kosmos 954* was intended to reach an altitude of 900km-1,000km²⁰ which would have allowed its power source 1,000 years to decay.²¹ Although the satellite would still be orbiting the Earth, the Soviet belief was that it would be a sufficient distance away that it would never pose a problem to human activity.

The *Kosmos* satellites were not unique in utilising atomic energy, other satellites have utilised nuclear power sources through radioisotope thermoelectric generators (RTGs).²² In order to create power, such devices convert the heat generated by natural radioactive decay into electricity.²³ The first such nuclear powered American satellite *Transit 4A* was launched in 1961, its power source was called 'System for Nuclear Auxiliary Power'²⁴ (SNAP-3), it only produced 2.7 watts but it continued to do so for fifteen years.²⁵ The first nuclear reactor in space powered the American *OPS 4682* spacecraft in 1965 (the vessel was known as *SNAPSHOT*).²⁶ As with a terrestrial nuclear reactor, the satellite's power source generated energy through bombarding uranium-235, in order to create a fission reaction.²⁷ By the time that *Kosmos 954* had completed its operational life time it was estimated to contain 1,000,000 curies of alpha, beta and

¹⁹ *Cosmos Reentry Spurs Nuclear Waste Debate*, AVIATION WEEK AND SPACE TECHNOLOGY (Jan. 30, 1978).

²⁰ Nicholas L. Johnson; *A New Look at Nuclear Power Sources and Space Debris*, in PROCEEDINGS OF THE 4TH EUROPEAN CONFERENCE ON SPACE DEBRIS 551 (Darmstadt, Germany: European Space Agency, 2005).

²¹ NASA Space Link, *Space Nuclear Power Technology*, <http://spacelink.nasa.gov/NASA.Projects/Human.Exploration.and.Development.of.Space/Human.Space.Flight/Shuttle/Shuttle.Missions/Flight.031.STS-34/Galileos.Power.Supply/Space.Nuclear.Power.Technology>.

²² Galloway, *supra* note 18, at 404-405.

²³ U.S. Department of Energy, Office of Nuclear Energy, Science, and Technology; *Nuclear Power in Space*, 18-19 (Washington, D.C.), www.ne.doe.gov/pdf/npspace.pdf.

²⁴ The abbreviation "SNAP" is also some times considered to denote "Space Nuclear Auxiliary Programme".

²⁵ U.S. Department of Energy, *supra* note 23, at 7 & 16.

²⁶ *A New Look at Nuclear Power Sources and Space Debris*, *supra* note 20.

²⁷ *Space Nuclear Power Technology*, *supra* note 21.

gamma radiation, roughly the equivalent of a small atomic explosion.²⁸

The causes for the crash of *Kosmos 954* are not entirely clear, the Soviet news agency, TASS, reported that the satellite experienced a sharp depressurization on 6th January 1978 due to unknown reasons. It appears probable that this was due to a fuel tank being exhausted, either due to a leak or some form of explosion. This would have prevented the satellite's engines from firing and may have caused a downward thrust towards a lower orbit, and eventual re-entry.²⁹ A Soviet spokesman, Leonid Sedov, explained this sequence of events as the consequence of *Kosmos 954* being involved in an impact with another craft. If this was the case, it would have been an early instance, perhaps the first, of a satellite being adversely affected by an impact with debris. Such an impact may have prevented any efforts made to control the satellite and prevent its fragmentation.³⁰

Raising satellites to a higher orbit, which the USSR intended to use as a means of disposal for the satellite had been successful on other occasions. *Kosmos 952* successfully boosted its orbit to 600 miles above the planet, a 'parking and storage' orbit, on 25th December 1977, as had 14 other surveillance satellites previously.³¹ However, when *Kosmos 954* attempted this manoeuvre, a few days after its sister satellite, it began to develop serious problems, which continued into the New Year. On 12th January 1978 United States' President Carter contacted the USSR to offer American assistance in predicting where the troubled craft would crash.³² However, the Soviets maintained that it would destruct in the atmosphere before it could reach the surface of the planet.³³ The offer of assistance reflected the difficulties associated with such objects returning. When the satellite survived re-entry, less than two weeks after the Ameri-

²⁸ Paul G. Dembling, *Cosmos 954 and the Space Treaties*, 6(2) J. OF SPACE L. 131 (1978).

²⁹ *Id.* at 130.

³⁰ *Technical Report on Space Debris*, *supra* note 1, at 93.

³¹ Dembling, *supra* note 28, at 129-130.

³² S.E. Doyle, *Re-entering Space Objects: Facts and Fiction*, 6(2) J. OF SPACE L. 110 (1978).

³³ Galloway, *supra* note 18, at 402.

can approach, NASA/NORAD believed that it would land near Hawaii, whilst the Soviets predicted an area near the Aleutian Islands.³⁴ During re-entry the majority of the craft did burn up in the atmosphere.³⁵ The design of the satellite was intended to ensure that the nuclear reactor would completely burn up;³⁶ however, this did not happen and the Canadian authorities subsequently recovered approximately 0.1% of *Kosmos 954*'s nuclear power source.³⁷

THE RECOVERY OPERATION

The initial Canadian efforts to locate the debris, and assess the damage, involved more than 400 scientists and military personnel, along with 12 aircraft,³⁸ an operation conducted with the assistance of the United States.³⁹ The US flew KC135 jets and U-2s equipped with filters designed to trap radioactive fallout still in the upper atmosphere.⁴⁰ The debris was scattered over an area estimated to be 124,000 square kilometres,⁴¹ as such it is not surprising that the recovery operation lasted for most of 1978.⁴²

At launch *Kosmos 954* weighed approximately 5 tons;⁴³ fragmentation in the upper atmosphere, reduced it to approximately 4,000 pieces.⁴⁴ Most importantly, several thousand pieces of debris were later reported to be 1mm spheres, which had cores of nearly pure uranium-235, these were scattered over an area of

³⁴ Doyle, *supra* note 32, at 110.

³⁵ United Press International (Jan. 7, 1983).

³⁶ *Canada: Claim Against the Union of Soviet Socialist Republics for Damage Caused by Soviet Cosmos 954*, 18 I.L.M. 899, 903 (1979) [hereinafter *Canada: Claim Against the Union of Soviet Socialist Republics*].

³⁷ "The Cosmos 954 Accident" *Healthy Environments and Consumer Safety*, www.hc-sc.gc.ca/hecs-sesc/nep/d/nep-events/cosmos.html (last visited Nov. 13, 2008) [hereinafter *The Cosmos 954 Accident*].

³⁸ *Radioactive Piece of Soviet Satellite Round*, FACTS ON FILE WORLD NEWS DIGEST (Feb. 17, 1978).

³⁹ *Id.*

⁴⁰ Dembling, *supra* note 28, at 126.

⁴¹ *The Cosmos 954 Accident*, *supra* note 37.

⁴² *Canada: Claim Against the Union of Soviet Socialist Republics*, *supra* note 36, at 929.

⁴³ Dembling, *supra* note 28, at 126.

⁴⁴ Note Verbale Dated 19 December 1978, *supra* note 9.

several hundred kilometres.⁴⁵ In its claim for compensation, against the U.S.S.R., the Canadian government stated that it considered some of the fragments found to have a lethal level of radioactivity.⁴⁶ A lethal dose of radiation is approximately 500 roentgens; however, smaller doses are still harmful, especially when coupled with long term exposure; workers at nuclear installations are not allowed to absorb more than 5 roentgens per year.⁴⁷ A single piece of *Kosmos 954*, found in the region of Artillery Lake, a 10cm long metal cylinder, was emitting 100 Roentgens per hour.⁴⁸

By 8th February 1978, the Canadian authorities did not consider that they had received sufficient information from the U.S.S.R. This resulted in the view that their enforced ignorance was hampering the search for remnants of the satellite. Answers as to the nature of *Kosmos 954's* fuel, the shielding in which it was contained and most importantly how the Soviet Union would have conducted the recovery operation had the satellite landed in their territory, had not been provided.⁴⁹

Canadian translations of the Soviet response notes that the embassy expressed regret that the U.S.S.R. had not participated in the recovery operation in Canada, "guided by the rules and principles of international law." The response asserted that such assistance had been immediately offered when debris was discovered in Canadian territory.⁵⁰ Yet the Soviet Union's response did not answer the technical questions which Canada had posed. Canadian communications to the U.S.S.R., on 28th February 1978, emphasised that the assistance they required was not the Soviet Union's physical help in recovering fragments of the satellite, but technical information to aid the search.⁵¹

⁴⁵ Lawrence, *supra* note 15.

⁴⁶ *Canada: Claim Against the Union of Soviet Socialist Republics, supra* note 36, at 904.

⁴⁷ *Radioactive Piece of Soviet Satellite Round, supra* note 38.

⁴⁸ Note Verbale Dated 3 March 1978, *supra* note 9.

⁴⁹ *Canada: Claim Against the Union of Soviet Socialist Republics, supra* note 36, at 913-915.

⁵⁰ The Canadian legal documents from which this information is taken notes that they are an unofficial translation of the Soviet Union's statement. *Id.* at 915.

⁵¹ *Id.* at 916-919.

Canada continued to pose technical questions for several months during 1978, the most detailed set being raised on 13th April.⁵² The largest problem in the communications concerning the incident appears to have been the nature of *Kosmos 954*. As a 'spy satellite' the U.S.S.R. appeared reluctant to reveal information concerning its constitution, commenting:

The Soviet side finds it also necessary to note that some of the questions put by the Canadian side obviously relate to the information which is outside of the scope of the amount necessary to secure health and safety of persons and the environment.⁵³

However the suggestion that the U.S.S.R. was not forthcoming with assistance concerning *Kosmos 954* was somewhat contradicted by President Carter's Assistant for National Security Affairs, Dr. Z. Brezinski, who stated that the situation "was handled through very effective international cooperation, involving the Soviets also."⁵⁴ Further, the Soviet delegate Boris Maiorski specifically reported to the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), that as soon as it became apparent that *Kosmos 954* had fragmented over Canada, the government of the U.S.S.R. offered immediate assistance.⁵⁵ This interpretation of events was disputed by the Canadian delegate, Erik B. Wang, who maintained that although the U.S.S.R. had offered to cooperate, this offer had been subsequent to the search operation commencing, further the information provided concerning the satellite had not been sufficient nor complete.⁵⁶

When the recovery operation was completed, the effects of *Kosmos 954* upon the natural environment were not considered

⁵² *Id.* at 923-926.

⁵³ The Canadian legal documents from which this information is taken notes that they are an unofficial translation of the Soviet Union's statement. *Id.* at 928.

⁵⁴ Galloway, *supra* note 18, at 402.

⁵⁵ Maiorski then pointedly commented that "[t]he question of how that aid was used related to an area in which every Government makes independent and sovereign decisions." *Id.* at 406-407.

⁵⁶ *Id.* at 407-408.

to be significant.⁵⁷ Further, although some local residents were exposed to small amounts of radiation none suffered any serious harm,⁵⁸ and there was no detectable contamination of “air, water or food supplies.”⁵⁹ It was fortunate that the debris had fallen into a largely uninhabited region, rather than a dense urban population. Despite the relative good fortune, regarding this particular incident, there are two important factors to consider; firstly it was not a unique event, nor is there reason to believe that such an impact, or one more serious, could never occur again. Secondly, the cost of repairing the damage entitled Canada to make a formal claim for reparations against the U.S.S.R., and thus exercise liability as it is contained within space law.

OTHER INCIDENTS OF SATELLITES FALLING TO THE EARTH

The crash of *Kosmos 954* was the most dramatic instance of an artificial space object crashing to Earth, and the first to create a crisis,⁶⁰ however it was not unique. In September 1962, at a meeting of the UN Outer Space Committee, the United State’s delegate presented a twenty pound piece of metal, that had been found in Wisconsin. It was believed to be debris from the Soviet satellite *Sputnik IV*, which had crashed into American territory.⁶¹ The exhibit was an early demonstration of the danger of spacecraft fragments accidentally landing on the surface of the planet; a threat which was partially realised by *Kosmos 954*.

Prior to the *Kosmos 954* incident, the United States had been involved in three occasions in which nuclear power sources returned from space, one burned up in the atmosphere, whilst parts of the other two were recovered from the oceans by the

⁵⁷ Lawrence, *supra* note 15.

⁵⁸ James Oberg, *The Probe That Fell To Earth*, NEW SCIENTIST (Mar. 6, 1999).

⁵⁹ NASA Space Link, *Space Nuclear Power System Accidents*, <http://spacelink.nasa.gov/NASA.Projects/Human.Exploration.and.Development.of.Space/Human.Space.Flight/Shuttle/Shuttle.Missions/Flight.031.STS34/Galileos.Power.Supply/Space.Nuclear.Power.System.Accidents>.

⁶⁰ Stephen Gorove, *Cosmos 954: Issues of Law and Policy*, 6(2) J. OF SPACE L. 138 (1978).

⁶¹ The Soviet delegate declined to take the object as a gift. BIN CHENG, *STUDIES IN INTERNATIONAL SPACE LAW* 286-287 (Oxford, Clarendon Press, 1997).

Navy.⁶² One of these incidents, in April 1964, concerned the return of the US satellite *Transit 5BN3*; this was powered by *SNAP 9*. It crashed into the Indian Ocean when its launch vehicle failed, and until *Kosmos 954* this was the worst such incident.⁶³ Subsequent to *Kosmos 954*, in 1979, debris from an American *Skylab* satellite landed in Australia; no governmental claim for damages was made, as there was no clean up cost, however the United States did refuse the claims of approximately 40 Australian citizens who cited mental distress caused by *Skylab*.⁶⁴ Similarly, the Russian *Mars-96* probe, dramatically failed to reach Mars, crashing back to Earth and scattering plutonium over Chile. In this instance it was decided to level the debris *in situ* rather than attempt to retrieve it.⁶⁵

Given the dangerous operation that the *Kosmos* surveillance satellites performed, it is not surprising that they encountered further problems. Following the *Kosmos 954* incident the Bouk reactors, which powered the satellites, were redesigned such that the nuclear core would be ejected, in order to ensure that it was completely vaporized in the atmosphere.⁶⁶ This new system proved successful when *Kosmos 1402* re-entered the atmosphere, above the Indian Ocean.⁶⁷ The core successfully ejected, burning up high above the planet and the radiation was dispersed over a very wide area.⁶⁸ *Kosmos 1900* also encountered difficulties, on this occasion, the satellite was also able to eject its nuclear reactor before it re-entered the Earth's atmosphere. The reactor core was sent into a higher orbit, where it posed no foreseeable threat.⁶⁹

⁶² One of the items recovered from the sea was part of the ill fated Apollo 13 mission. See Dembling, *supra* note 28, at 131.

⁶³ David S.F. Portree & Joseph P. Loftus, *Orbital Debris: A Chronology*, NASA/TP-1999-208856, at 6 (Jan. 1999).

⁶⁴ Margaret B. Carlson, *Space Law Launches Increasing Number of Lawyers*, LEGAL TIMES (June 14, 1982).

⁶⁵ Oberg, *supra* note 58.

⁶⁶ Space Nuclear Power Technology, *supra* note 21.

⁶⁷ Bryan Brumley, *Nuclear Debris Expected To Rain To Earth This Week*, THE ASSOCIATED PRESS (Oct. 1, 1988).

⁶⁸ *Return of the native. (space junk)*, *supra* note 16.

⁶⁹ *Spy Satellite Reactor Now in a Safe Orbit, Its Trackers Report*, THE NEW YORK TIMES (Oct. 5, 1988).

The problem of satellites returning into the atmosphere has persisted, although most occasions do not have dramatic consequences. The Soviet satellite *Kosmos 1402* crashed back to the Earth in February 1983,⁷⁰ whilst in January 2005 a US craft crashed near Bangkok,⁷¹ and *Kosmos 389* is about to re-enter the atmosphere.⁷² Perhaps the most remarkable such instance occurred in January 1995, when after three hours in orbit a Japanese-German satellite *Express* returned to Earth. It crashed in Ghana, where it is reported that tribesmen took it as a gift from the gods and worshipped it accordingly. It was then retrieved by the army who, *The Ghanaian Chronicle* inferred, believed that it was alien in origin. This incident also demonstrated the difficulty in predicting where an object will crash land, the satellite's German operators had expected it to crash into the Pacific Ocean.⁷³

When these instances are compared to the danger posed by debris, the increased threat of the new problem can be seen. The majority of re-entries do not result in any serious consequences and few are widely reported. However, the potential of the new threat is such that it could seriously disrupt space operations over a time scale measured in centuries.

REACTION TO THE INCIDENT

Within a week of *Kosmos 954*'s crash President Carter expressed his desire for an agreement with the Soviet Union, whereby nuclear materials would not be used onboard satellites orbiting the Earth. This proposition did not envisage a prohibition upon their use for deep space missions, which operate too

⁷⁰ H. Klinkrad, et al., *Space Debris Activities in Europe*, in PROCEEDINGS OF THE 4TH EUROPEAN CONFERENCE ON SPACE DEBRIS 25 (Darmstadt, Germany: European Space Agency, 2005).

⁷¹ Nicholas Johnson, *Orbital Debris Research in the U.S.*, in PROCEEDINGS OF THE 4TH EUROPEAN CONFERENCE ON SPACE DEBRIS 9 (Darmstadt, Germany: European Space Agency, 2005).

⁷² Sergey Kulik, *The Russian Federation Space Plan 2006-2015 and Activities in Space Debris Problems*, in PROCEEDINGS OF THE 4TH EUROPEAN CONFERENCE ON SPACE DEBRIS 15 (Darmstadt, Germany: European Space Agency, 2005).

⁷³ Chris Oliver Wilson, *Space-Shot Flop Becomes Tribesmen's Fallen Idol*, THE SUNDAY TELEGRAPH 24 (Feb. 18, 1996).

far from the Sun for solar energy to be used effectively.⁷⁴ The Canadian government pursued two legal objectives, firstly gaining compensation for the crash, secondly focusing upon safe means by which nuclear power could be used in space.⁷⁵

The accident highlighted the serious dangers of nuclear power sources being utilised in orbit. Before this incident most Nuclear Power Source (NPS) programmes had been largely abandoned as solar cells offered a more efficient means of powering satellites, though the *Russian Radar Ocean Reconnaissance Satellite (RORSAT)* programme, of which *Kosmos 954* was part,⁷⁶ had continued into the 1970s.⁷⁷ The practice has now been completely abandoned; no nuclear powered satellites have been launched since 1988, but fifty three such satellites remain in orbit, largely located at around an altitude of 1,000km. This altitude was chosen as a disposal orbit before space debris was considered to be a serious problem, this is unfortunate as it is now identified as having one of the highest densities of debris.⁷⁸ It has been suggested that the nuclear powered satellites which remain in orbit have contributed to high debris densities. Leakages from the coolant systems of these satellites are considered to be the source of particles approximately 1cm in diameter. The total number of such particles, with a combined mass of 30kg, is estimated to be 80,000.⁷⁹ Thus, NPS satellites left in orbit, are in a region of a high debris density, and are potentially a source of large numbers of small pieces of debris.

In the decade that followed the cessation of NPS being launched, the U.S.S.R. and U.S.A. conducted considerable research into new nuclear reactors for usage in space.⁸⁰ More recently, some states have considered the possibility of again us-

⁷⁴ Galloway, *supra* note 18, at 404-405.

⁷⁵ Jason Reiskind, *Towards A Responsible Use of Nuclear Power in Outer Space – The Canadian Initiative In The United Nations*, VI ANNALS OF AIR AND SPACE LAW 463-464 (1981).

⁷⁶ Portree and Loftus, *supra* note 63, at 25.

⁷⁷ *A New Look at Nuclear Power Sources and Space Debris*, *supra* note 20.

⁷⁸ *Id.* at 552 & 554.

⁷⁹ A.I. Nazarenko, et al., *Spacecraft with a Nuclear Power System and Problems of Space Debris*, in PROCEEDINGS OF THE 4TH EUROPEAN CONFERENCE ON SPACE DEBRIS 558 (Darmstadt, Germany: European Space Agency, 2005).

⁸⁰ *A New Look at Nuclear Power Sources and Space Debris*, *supra* note 20.

ing NPS onboard satellites, specifically radioisotope power systems (RPS) and nuclear propulsion systems.⁸¹ There has also been political attention paid towards the subject, in 1992, the United Nations General Assembly highlighted the associated dangers, when it adopted *Principles Relevant to the Use of Nuclear Power Source In Outer Space* (Resolution 47/68).

When considering the danger of NPS in near Earth orbit, it is necessary to note that whilst they remain in space their radioactive nature does not pose any threat to humanity. Should a NPS satellite fragment, the resulting debris would be no more dangerous than any other type of debris, due to the absence of biological life in space. Further, it is projected that debris resulting from a nuclear power source would be expected to be less able to survive re-entry into the atmosphere than conventional debris, thus reducing the risk of radiation being able to enter the eco-system.⁸²

The practice of placing defunct satellites with nuclear power sources on board into a relatively high orbit, where they would pose no danger, and the fission fragments could naturally decay, appeared to be an unproblematic solution when it was put into practice, in the 1970s. However, this is now in contradiction with the efforts to preserve near Earth space from the problem of debris. Orbits close to the planet are now conceptualised as a resource in need of protection. As such, leaving nuclear power sources in orbit to decay is in conflict with the Inter-Agency Debris Coordination Committee's (IADC)⁸³ guidelines, which stipulate that satellites should not remain in LEO for more than 25 years after the end of their operational life time. Nicholas Johnson suggests that this conflict could be resolved by the usage of storage orbits above LEO.⁸⁴ As the orbits selected would be used infrequently, it is believed that, the radioactive debris would pose little threat.

⁸¹ *Id.* at 551.

⁸² *Id.* at 553.

⁸³ The IADC is a body constituted of all the major space faring powers. It proceeds on the basis of cooperation with the objective of creating a framework within which to manage the debris problem.

See Inter-Agency Space Debris Coordination Committee, www.iadc-online.org.

⁸⁴ *A New Look at Nuclear Power Sources and Space Debris*, *supra* note 20.

LEGAL FRAMEWORK WITHIN WHICH THE CRASH WAS MANAGED

The 1967 Outer Space Treaty⁸⁵ establishes the broad principles upon which the exploration and exploitation of space occurs. Article VI of the treaty places responsibility upon states for their national activities conducted in space, or upon celestial bodies. It continues, in Article VII, to place liability upon a launching state for damage caused to any other state party to the treaty, by an object which it has launched. Article VIII of the treaty also has implications in the case of *Kosmos 954*, it commits states to return, to the state of registry, objects which accidentally land in their territory.

The Rescue Agreement,⁸⁶ to which both Canada and the U.S.S.R. were party,⁸⁷ re-enforced Article VIII of the Outer Space Treaty. Although primarily concerned with the treatment of personnel in space the Rescue Agreement, in Article 5, addresses objects which return from space. In accordance with the treaty's provisions, Canada informed the U.S.S.R. that component parts of one of its space objects had been located in Canadian territory.⁸⁸ Further, with reference to Paragraph 1 of Article 5 of the treaty, Canada informed the Secretary General of the United Nations that the remnants of *Kosmos 954* had been found in its territory.⁸⁹

⁸⁵ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347 [hereinafter Outer Space Treaty]. The U.S.S.R. was a depository government for the treaty, whilst Canada was a party to it from 1967, See U.S. Department of State, *Current Treaties and Agreements*, www.state.gov/t/ac/trt/5181.htm.

⁸⁶ Agreement on the Rescue of Astronauts the Return of Astronauts and the Return of Objects Launched into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, U.N. GAOR 22nd Sess., Supp. No. 16, U.N. Doc A/6716 [hereinafter Rescue Agreement].

⁸⁷ The U.S.S.R. was one of the depository governments for the treaty (Article XIV), whilst Canada signed it in 1968 and ratified it on 20th February 1975. See Agreement on the Rescue of Astronauts (Summary Information), http://pubx.dfaits-maeci.gc.ca/A_BRANCH/AES/env_commitments.nsf/0/4ac0c900f6ff6d1e985256b6c004aeb a7?OpenDocument.

⁸⁸ The U.S.S.R. was formally informed on 8th February 1978. See, *Canada: Claim Against the Union of Soviet Socialist Republics*, *supra* note 36, at 910-911.

⁸⁹ The United Nations provides a list of objects found which have been reported through their offices. See, U.N. Office for Outer Space Affairs, *List of Reported Space Objects Discovered by Member States within their territories*, U.N. Doc. A/AC.105/214 (Feb. 8, 1978), available at <http://www.unoosa.org/oosa/nactact/sdnps/unlfd.html>.

Paragraph 3 of Article 5 provides for the return of objects, and their component parts. This requirement had little importance, the objects recovered were radioactive waste, as such the Soviet Union did not express a desire to have them returned. On 20th February 1978 the U.S.S.R. formally notified Canada that it could dispose of the recovered items at its discretion.⁹⁰

The treaty also provides states with a means to request assistance from the launching state, in the recovery of objects which have landed in their territory.⁹¹ Although it had the right to do so Canada did not request physical Soviet assistance in the recovery operation.⁹² Paragraph 4, of Article 5, specifically deals with occasions when hazardous materials are found to have landed within the territory of a state. In such circumstances, the launching state is obliged to take immediate actions in order to “eliminate possible danger.” It would appear that under the terms of this paragraph, Canada had the authority to request that the U.S.S.R. itself retrieved the material from Canadian territory, then dispose of it elsewhere. Paragraph 5 of the same Article refers to the costs involved in recovering crashed space objects, these are to be born by the launching state, as with a similar general principle contained within the Outer Space Treaty,⁹³ this notion was giving a more specific legal form in a later treaty designed to specifically address issues of liability.

The Liability Convention⁹⁴ does not stand in isolation, it builds upon the principles of the Outer Space Treaty and the Rescue Agreement. The treaty was produced by UNCOPUOS

⁹⁰ The Canadian legal documents from which this information is taken notes that they are an unofficial translation of the Soviet Union's statement. *See, Canada: Claim Against the Union of Soviet Socialist Republics*, *supra* note 36, at 915-916. The USSR reiterated this position on 21st March 1978. *Id.* at 922-923.

⁹¹ Rescue Agreement, *supra* note 86, at art. 5, para. 2.

⁹² Galloway, *supra* note 18, at 411.

⁹³ Outer Space Treaty, *supra* note 85, at arts. VI & VII.

⁹⁴ The U.S.S.R. is one of the three depository governments for the Liability Convention (Article XXIV). The treaty entered into force on 1st September 1972, when it received its fifth ratification (CHENG, *supra* note 61, at 286), Canada acceded to the treaty on 20th February 1975. *See, Convention on International Liability for Damage Caused by Space Objects (Summary Information)*, www.fco.gov.uk/Files/kfile/015_DamageSpaceObjects.pdf.

after nine years of negotiations,⁹⁵ the process of completing this treaty was considered by Herbert Reis, a legal advisor to the American Mission to the United Nations, as one of the most difficult in the post-war era.⁹⁶ It was this treaty which provided Canada with the primary legal basis upon which it made its claim for compensation, this was not the only option available, had it wished the Vienna Convention on Civil Liability for Nuclear Damage offered an alternative legal recourse.⁹⁷

Ironically, during the drafting of the *Liability Convention*, the U.S.S.R. had argued that 'nuclear damage' should be excluded from the convention, and addressed in a separate treaty. This was virtually unanimously opposed by the other members of the Legal Sub-Committee of UNCOPUOS, and in 1969 the Soviet objection was withdrawn.⁹⁸

The initial articles of the Liability Convention clearly reveal its applicability in this instance, Article I defines a space object as including 'component parts of a space object'. Whilst it continues in Article II stating that, '[a] launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the Earth'. There is little doubt concerning the relevance of this article, as the identity of the object which crashed into Canadian territory, was never disputed. Although there was no loss of life, or serious health implications, resulting from the crash of *Kosmos 954* the damage to Canadian property, specifically its environment, permitted the treaty to be invoked.⁹⁹

Because the U.S.S.R. never denied the radioactive fragments located in Canada were of Soviet origin,¹⁰⁰ the compensation claim proceeded rapidly; Article X of the *Liability Convention* requires that a state makes its claim for compensation

⁹⁵ CHENG, *supra* note 61, at 286. Cheng provides a thorough account of the drafting process and review of the text of the treaty. *Id.* at 286-356.

⁹⁶ Herbert Reis, *Some Reflections on the Liability Convention for Outer Space*, 6(2) J. OF SPACE L. 125 (1978).

⁹⁷ Gorove, *supra* note 60, at 144.

⁹⁸ CHENG, *supra* note 61, at 323-324.

⁹⁹ Liability Convention, *supra* note 5, at art. I.

¹⁰⁰ *Canada: Claim Against the Union of Soviet Socialist Republics*, *supra* note 36, at 902-905.

within one year of the damage occurring, or the identification of the responsible party, should that not be immediately known. Due to the latter clause not being relevant Canada was able to act promptly. The legal process was given increased pace and clarity as the USSR made it clear, before Canada made a claim, that it was willing to pay compensation.¹⁰¹

Stephen Gorove observes that, although neither term has been formally defined, within space law the terms 'liability' and 'responsibility' have differing meanings although they are closely connected. The former refers to liability which a state bears for damaged caused by objects which it has launched into orbit, whereas the latter refers to the more general international responsibility which a state has for its activities in outer space. Therefore responsibility denotes the norms of behaviour that apply to states and their representatives.¹⁰²

The concept of 'liability' in space law is further complicated because of the potential applicability of international law, domestic law and foreign law.¹⁰³ Thus in the case of *Kosmos 954* arguments could have been made that liability should have been addressed under Soviet law, as the satellite originated there, or Canadian law as the damage occurred in its territory.

Within the *Liability Convention* there are differing degrees of liability in accordance with the location in which damage is caused. Liability is limited when an incident occurs in air space, or in outer space, as the treaty states that damage caused "other than on the surface of the Earth" liability is dependent upon their being fault in the actions of a state.¹⁰⁴ This has clear implications for scenarios involving debris, as the damage would be caused in outer space. In order for the treaty to be used successfully, there would be a necessity to prove fault. However, when damage is caused on the surface of the Earth, such as the case of *Kosmos 954*, the highest degree of liability is incurred, covering virtually all damage caused, without restriction.¹⁰⁵ In theory,

¹⁰¹ Gorove, *supra* note 60, at 138.

¹⁰² *Id.* at 373-379.

¹⁰³ *Id.* at 373.

¹⁰⁴ CHENG, *supra* note 61, at 326-328.

¹⁰⁵ *Id.* at 320-323.

this could have resulted in the U.S.S.R. being liable to pay an enormous amount, however, as the satellite landed in an uninhabited region, there was no loss of life due to the crash nor was there damage to private property. However, because of the nuclear power source on board, the area needed to be decontaminated, the Soviet Union was liable for the cost of this clean up; Canada accordingly made a claim against the U.S.S.R.

The Soviet Union could have pleaded exception from liability under Article VI if it demonstrated that the events were a result of gross negligence by Canada,¹⁰⁶ this would have been a difficult argument as Canada was a fixed target with which the satellite collided. Similarly when considering debris, it is difficult to imagine how an object damaged by debris could be considered to be grossly negligent if it were merely orbiting the Earth.

In consideration of damages the Liability Convention states that they should be paid to restore the claimant "to the condition which would have existed if the damage had not occurred."¹⁰⁷ It is notable that the purpose of the treaty is to grant restorative not punitive damages, which suggests the assumption has been accepted that any damage which occurs will be the product of accidents, rather than belligerent intent. Clearly there would only have been a very weak argument to suggest that the U.S.S.R. should have been subject to punitive damages, as the incident was the product of an accident, although the U.S.S.R. had made the decision to place a nuclear powered satellite in a very low, and therefore hazardous, orbit. With reference to the debris problem, punitive damages would not appear to be appropriate either as a large amount of the current debris population was produced before the problem was identified, further what is still produced is not done so deliberately. However, should explosions occur in orbit due to the use of weapons, then a far stronger philosophical argument would exist for punitive damages to be demanded by a third party who's resources were damaged as a consequence. Yet it is difficult to conceptualise a

¹⁰⁶ Dembling, *supra* note 28, at 133.

¹⁰⁷ Liability Convention, *supra* note 5, at art. XII.

scenario in which a punitive notion of liability could be introduced into space law.

Canada originally made a claim for C\$6million¹⁰⁸ in damages and costs, whilst the total price of the clean up was estimated to be as high as C\$14million.¹⁰⁹ The difference between the two amounts, is due to Canada claiming for only reasonable costs and those which it could accurately calculate.¹¹⁰ Ultimately, in 1981, the Soviet Union agreed to pay C\$3million¹¹¹ due to the damage caused, however it did not admit liability for the incident.¹¹²

As the Soviet Union offered an acceptable payment, there was no requirement for the provisions relating to settlement of the disputes to be invoked.¹¹³ Had the two states not reached agreement through diplomatic negotiations within one year of a notification of a claim being made¹¹⁴ concerning the amount of compensation to be paid, the Liability Convention has provision for a Claims Commission to be established. This body would be composed of three members who would investigate the basis of the claim, one member being appointed by each party whilst the third member, the chair, would be appointed by mutual consent.¹¹⁵

In the opinion of Margaret Carlson, had the U.S.S.R. and Canada failed to reach an agreement, the practical limitations of the Liability Convention would have been exposed. The treaty provides for a Claims Commission to be established, however it

¹⁰⁸ The Canadian claim was for the exact figure of \$6,041,174.70 (Canadian). *Canada: Claim Against the Union of Soviet Socialist Republics*, *supra* note 36, at 899.

¹⁰⁹ *Canada-Soviets Sign Satellite Damage Pact*, THE ASSOCIATED PRESS (Apr. 2, 1981).

¹¹⁰ *Canada: Claim Against the Union of Soviet Socialist Republics*, *supra* note 36, at 906-907.

¹¹¹ The sum was in Canadian not American dollars, in U.S. dollars the figure was approximately \$2.55million. See Andrew Cohen, *Canada Settles With Russia for Satellite Crash*, UNITED PRESS INTERNATIONAL (Apr. 2, 1981).

¹¹² *Canada-Union of Soviet Socialist Republics: Protocol on Settlement of Canada's Claim for Damage Caused by "Cosmos 954"*, 20 I.L.M. 689 (1981); J.E.S. FAWCETT; OUTER SPACE 26-27 (Oxford, Clarendon, 1984).

¹¹³ *Orbiting Debris, A Space Environmental Problem - Background Paper*, *supra* note 7, at 32-33.

¹¹⁴ Liability Convention, *supra* note 5, at art. XIV.

¹¹⁵ *Id.* at arts. XIV - XX.

does not grant it binding authority upon the disputing parties.¹¹⁶ Bin Cheng notes that should both parties in the arbitration process not agree with the verdict of the Claims Commission it shall reach a final decision, which is not subject to appeal. However, this remains a “recommendatory award,” there is no legal mechanism to make the decision of the Commission binding; parties can only be bound by its finding if they chose to be so.¹¹⁷ “Recommendatory awards” are not without precedent in international law; Advisory Opinions of the International Court of Justice are a similar form of decision.¹¹⁸ Although they many not appear to be an ideal mechanism for the resolution of a dispute, this should not be considered a particular weakness of the Liability Convention, rather it is a reflection upon an international system in which there is no authority which can enforce decisions upon states.

An alternative position towards disputes between states is adopted within the European Space Agency (ESA) wherein, according to Article XVII of its founded convention, the verdict of a tribunal, established to investigate a dispute, is final and binding upon parties.¹¹⁹ However, in this instance states have agreed, by virtue of their membership of the organisation, to be bound by the decisions of such tribunals prior to a dispute arising. Further, ESA has the capacity to impose verdicts upon member states because of their close linkage within the Agency. Such a framework would not apply within general space law, as there is no similar close association of states which can be used to enforce verdicts.

The U.S.S.R.’s actions, or lack of action, during the recovery operation did not violate the principles of space law, partially because space law attempts to resolve issues *post hoc*, rather

¹¹⁶ Carlson, *supra* note 64.

¹¹⁷ Liability Convention, *supra* note 5, at art. XIX, para. 2 (provides states with the right to make the findings of the Commission binding).

¹¹⁸ There was disagreement concerning this structure, in effect of which, Canada, Japan, Iran and Sweden abstained when votes were taken in the First Committee and the General Assembly on votes to approve the draft convention. See CHENG, *supra* note 61, at 353-354.

¹¹⁹ Karl-Heinz Bockstiegel, *Arbitration and Adjudication Regarding Activities in Outer Space*, 6(1) J. OF SPACE L. 7 (Spring 1978). See, *The Convention for the Establishment of a European Space Agency*, 14 I.L.M. 864-908 (May 30, 1975).

than manage crisis situations. The Soviet Union did not provide an early warning that their satellite was going to crash into Canadian territory, although it is questionable whether the location of the crash was predicted with any useful degree of accuracy. Neither did it provide full answers to questions concerning the nature of *Kosmos 954* when the Canadian authorities were attempting to ascertain the potential damage caused.¹²⁰ Although this was against the spirit of co-operation which exists in the Liability Convention, that treaty does not stipulate that such details should be provided, its purpose is to regulate damage claims *post hoc*, rather than govern crisis situations.

Article XXI of the Liability Convention addresses instances wherein the crash landing of a space object "presents a large-scale danger to human life or seriously interferes with the living conditions of the population or the functioning of vital centres." In such instances all parties to the treaty, especially the state to whom the object is registered, shall "examine the possibility of rendering appropriate and rapid assistance." Due to the geographic nature of the territory in which the fragments of *Kosmos 954* landed, there was no large scale danger, therefore Canada did not have a legal basis upon which press the U.S.S.R. into providing information pertaining to the satellite, further the weak wording of the treaty would only have required the U.S.S.R. to examine its position. Canada's terse diplomatic language suggests a large degree of irritation with the U.S.S.R. regarding their release of information.¹²¹

In relation to space debris the case of *Kosmos 954* has implications for whether debris can be considered as 'space objects' in the legal sense of the term. The claim for damages by the Canadian government, and the subsequent payment by the Soviet Union, reveals that both parties considered the constituent parts of the satellite to be 'space objects' and therefore legally the possession, and responsibility, of the U.S.S.R. Although the legal status of debris remains a subject of debate between schol-

¹²⁰ *Canada: Claim Against the Union of Soviet Socialist Republics*, *supra* note 36, at 902-905.

¹²¹ *Id.* at 913-915 & 917-919.

ars,¹²² this practical instance strongly suggests that states remain liable for the resulting debris, when space objects fragment.

The fourth space treaty, which had been completed when *Kosmos 954* crashed, was the Registration Convention.¹²³ This treaty has little applicability to an instance of a crashed space object. However, Article VI creates a legal basis upon which the United States provided assistance to Canada, as it commits signatory states, especially those with space monitoring facilities, to assist in the identification of an object which has landed within sovereign territory. However, it appears more plausible to provide an account of the U.S.A.'s actions in relation to the close relationship between those two states, rather than an instance of space law influencing the actions of states.

The *Kosmos 954* incident highlighted a central weakness in the Registration Convention, the Soviet Union, for strategic reasons, provided a misleading, or at a minimum an incomplete, description in the record of objects launched into space. This was not a factor in the legal considerations arising from the crash of the satellite, however it provides an example of the difficulties associated with the register. The intention of the treaty was to create a mechanism by which orbits could be managed, through the maintenance of a database of all objects placed into near Earth space. However, because it is incomplete, and as *Kosmos 954* demonstrates contains inaccurate information, it has become virtually useless and 'serves little practical or legal purpose'.¹²⁴

The lack of importance associated with the Registration Convention is reflected in the number of states which have rati-

¹²² Lubos Perek, *Managing Issues Concerning Space Debris*, in PROCEEDINGS OF THE 4TH EUROPEAN CONFERENCE ON SPACE DEBRIS 589 (Darmstadt, Germany: European Space Agency, 2005).

¹²³ Registration Convention, *supra* note 9.

¹²⁴ Nicholas L. Johnson, *The Earth Satellite Population: Official Growth and Constituents*, in JOHN A. SIMPSON, PRESERVATION OF NEAR EARTH SPACE FOR FUTURE GENERATIONS 9 (Cambridge University Press, 1994). Despite its extremely limited utility, the registry is available on the web. See United Nations Office for Outer Space Affairs, *Online Index of Objects Launched into Outer Space*, www.unoosa.org/oosa/osoindex.html (last visited Nov. 13, 2008) [hereinafter *Online Index*].

fied it, only forty-six.¹²⁵ Lubos Perek argues that a more holistic acceptance of the treaty would strengthen it;¹²⁶ certainly it is the case that a complete and accurate database would only be possible if states supplied complete and accurate information. Such a complete register would be beneficial in managing such problem as space debris and nuclear power sources crashing to the Earth.

CONCLUSIONS

In 1978 Karl-Heinz Bockstiegel noted that space law was currently insufficiently equipped to resolve disputes, although they were seemingly inevitable.¹²⁷ In the nearly three decades which have passed little has occurred to make space law better able to resolve issues of liability, whilst the presence of debris has increased the possibility that it may be required to address such issues.

There is a clear differentiation to be highlighted concerning *Kosmos 954* and potential instances of damage caused by debris, specifically the location in which damage occurs. The Soviet satellite damaged Canadian property on the surface of the planet whereas the primary, almost exclusive, threat of debris exists in orbit. As such a differing level of liability applies, therefore a direct comparison is not possible. However, as *Kosmos 954* remains the most useful instance in which the provisions of space law and specifically the Liability Convention have been tested, it provides a valuable insight to the mechanics of liability and their application, revealing the institutional framework within which a claim under the Liability Convention would be conducted.

The Liability Convention is designed to restore the situation which existed before damage occurred. This restorative intention means that the treaty does not have the purpose of providing immediate assistance to resolve an incident in which li-

¹²⁵ *Online Index, supra* note 124.

¹²⁶ Lubos Perek, *Space Debris Mitigation and Prevention: How to Build a Stronger International Regime*, 2(2) *ASTROPOLITICS* 223 (Summer 2004).

¹²⁷ Bockstiegel, *supra* note 119.

ability arises. This is unsurprising as the document is intended to present a legal remedy. Yet in focusing upon restitution, the treaty negates the area in which the launching state could be of most assistance, remedying the immediate difficulties involved in a crisis situation. The most useful assistance which the U.S.S.R. could have given Canada was not the payment of damages, it would have been prior warning that *Kosmos 954* was going to enter Canadian territory, then supplying specific information as to radioactive nature of the satellite. The Liability Convention is notably silent concerning the immediate assistance which should be provided to a state that is subject to a crash, other than when the incident has produced extreme circumstances.¹²⁸

When the Liability Convention was completed it did not provide legal remedies for all possible scenarios, “a number of relatively exotic questions” remained unanswered.¹²⁹ As orbital debris had not been identified as a significant problem when the treaty was written, it is a question which although the treaty’s principles are applicable they do not directly address. This limits the relevance of the treaty, as debris is the most significant current threat poses to space based activities.

Gorove believes that the case of *Kosmos 954* brought to the fore the “uncertainties and inadequacies” of the legal framework within which such situations would be addressed in the future.¹³⁰ A similar situation now applies when considering potential claims for compensation due to space debris; the Liability Convention is untested in its capacity to resolve such an incident. In the case of *Kosmos 954* the treaty operated effectively, whilst it also demonstrated areas in which it created legal uncertainty.

¹²⁸ Liability Convention, *supra* note 5, at art XXI (extreme circumstances, and the appropriate response, are considered).

¹²⁹ Such an example could be injuries sustained in space or on a celestial body. It was accepted at the time that in the future a new specific treaty may be required to resolve such situations. Reis, *supra* note 96, at 128.

¹³⁰ Gorove, *supra* note 60, at 146.

If Leonid Sedov's claim, that *Kosmos 954* was struck by another craft is correct this could have dramatically altered the question of liability. If the other craft was not of Soviet origin, the state which launched it may have been at fault for the entire sequence of events. Such a scenario would have certainly made the legal proceeding far more complex. As the Soviet government in effect accepted liability by paying damages to Canada, there are three possible explanations; firstly *Kosmos 954* was struck by another craft and that craft was also of Soviet origin. Alternatively, it may be that the Soviet Union ultimately decided that there had not been a collision with another craft. Finally, it is possible that the U.S.S.R. could not prove the origin of the piece of debris which struck *Kosmos 954*, due the debris being small and untrackable. Therefore, it was unable to pursue the relevant launching state for compensation. Concerning *Kosmos 954* it is improbable that the U.S.S.R. believed that debris from another country was responsible for the satellite's demise, but decided to pay compensation regardless. Yet given the difficulty of accurately ascertaining what occurs in orbit this would be a probable scenario for future instances of debris impact.

The *Kosmos 954* incident revealed a great deal concerning the structures and provision created by the Liability Convention, these are relevant to potential future claims for damages caused by space debris. However, a key difference between the two cases does not relate to legal matters, rather it is the political climate during the era. The Cold War is a central feature in the narrative of *Kosmos 954*. The satellite was used for the purpose of spying upon American maritime activities, as such it was partially the political situation which lead to a nuclear powered satellite operating in such a low, and therefore dangerous, orbit. The Cold War climate also had an enormous influence upon the recovery operation. The Canadian government's position was that it requested information concerning the design of the satellite in order to conduct an effective operation. Whilst the same questions, to the Soviet government, were interpreted as inquiries not relevant to the recovery operation, but as an effort to extract strategically useful information.

Thus, the crash of *Kosmos 954* not only provides the most thorough examination of the Liability Convention available, it also provides, in microcosm, a demonstration of the effect of Cold War suspicions upon relations between Eastern and Western states. If the assertions that the two governments made are accepted as true reflections of their positions, then perfectly reasonable requests for technical information were interpreted as an effort to gain a strategic advantage. Given this global atmosphere of suspicion, it is perhaps notable that the legal claim was resolved without recourse to a panel of arbitration.

The Cold War tension defined the approach taken towards resolving problems which arose in the case of *Kosmos 954*, both in the initial Soviet refusal to acknowledge that there was a difficulty with the satellite, and the subsequent difficulties in the recovery operation. Indeed the geo-political climate has a far greater explanatory role concerning the incident than deficiencies within the Liability Convention itself.

Therefore, when considering the role of the treaty in reference to potential problems, which may arise in future, it is firstly important to note the enormous re-orientation there has been in global politics. Further, when considering instances involving orbital debris, it should be remembered that there is common interest in avoiding problems, and sharing information, as opposed to the zero-sum interactions relating to crashed spy satellites.

The two most significant problems which hampered the Canadian government, in the instance of *Kosmos 954*, were a lack of knowledge concerning where the satellite was to land, and the lack of cooperation in the recovery operation. In the instance of space debris, it is improbable that such problems will occur. There has been a notably cooperative international response to the problem.¹³¹ As such, the management of the debris

¹³¹ The IADC provides an institutional framework within which policy towards debris can be coordinated between several states. The member states have written guidelines for all states in order to commonly address the problem. It can therefore be considered to be one which has address through international cooperation.

problem has been characterised by dangers being identified through the sharing of tracking information, such cooperation can be reasonably expected to characterise initial responses to impacts.

The question remains as to whether cases of liability would be resolved in a similar spirit. An initial difference between *Kosmos 954*, and a potential incident of a satellite being damaged by debris is the availability of information. When an object crashed into Canadian territory there was no doubt that it was the Soviet craft *Kosmos 954*; should a satellite be damaged in orbit there would be far less certainty. The most probable scenario is that the debris responsible would be too small to be tracked, therefore it would be impossible for liability to be proved. Should the origin of the debris be known, the situation would still not be simply resolved. For, when damage occurs in space, the provisions of the Liability Convention require fault to be shown, this would be difficult to prove in the instance of a dead satellite, spent rocket stage or stray bolt. Also in the absence of access to the physical evidence the possibility remains that a state may simply deny that the object involved was its property.

The treaties compromising space law were written before space debris was identified as a serious problem, as such they are not easily applied to the issue. This piece has examined whether the Liability Convention could address future incidents concerning debris. The case of *Kosmos 954* revealed the manner in which the treaty would attempt to resolve problems, it was found that the there are provisions of the treaty are not easily applicable to the problem of debris. Firstly, the issue of which state launched an object which has caused damage is particularly difficult to ascertain when considering small pieces of debris. Secondly, the Liability Convention when addressing incidents of damage in space requires fault to be shown, it is difficult to conceptualise how pieces of debris which are in orbit, as a by-product of space activities, could be considered to exist because of fault by states. Finally, the treaty aims to be restorative as such it is seeking to address the situation after damage

has occurred, whereas the current need with reference to debris is to reduce the possibility of incidents occurring, rather than managing a situation after damage has occurred.

FY-1C AND USA-193 ASAT INTERCEPTS: AN ASSESSMENT OF LEGAL OBLIGATIONS UNDER ARTICLE IX OF THE OUTER SPACE TREATY

Michael C. Mineiro^{*}

I. INTRODUCTION

On January 11, 2007¹ (EST), China performed a successful anti-satellite (ASAT) missile test using a kinetic kill vehicle launched from the Xichang Satellite Launch Center (XSLC), a facility in Sichuan Province, China.² The kinetic kill vehicle destroyed an aging, but functioning, Chinese weather satellite, the *Feng Yun 1C (FY-1C)*, in polar orbit at an altitude of approximately 537 miles.³ This was the first such destruction of a satellite since the kinetic ASAT missile tests conducted during the Cold War by the United States and the Soviet Union.⁴

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¹ The test occurred on January 11, 2008 in the United States, but because of the difference in local times the event occurred on January 12, 2008 in China.

² Craig Covault, *Chinese Test Anti-Satellite Weapon*, AVIATION WEEK, Jan. 17, 2007, http://www.aviationweek.com/aw/generic/story_channel.jsp?channel=space&id=news/CHI01177.xml; Craig Covault, *China's ASAT Test Will Intensify U.S.-Chinese Standoff*, AVIATION WEEK, Jan. 24, 2007, http://www.aviationweek.com/aw/generic/story_generic.jsp?channel=awst&id=news/aw012207p2.xml.

³ T.S. Kelso, *Analysis of the 2007 Chinese ASAT Test and the Impact of its Debris on the Space Environment*, 2007 AMOS CONFERENCE 321 (2007), <http://www.centerforspace.com/downloads/files/pubs/AMOS-2007.pdf>.

⁴ Shirley Kan, *China's Anti-Satellite Weapon Test*, CRS REPORT FOR CONGRESS, Apr. 23, 2006, <http://fpc.state.gov/documents/organization/84322.pdf>.

One year later, on February 14, 2008, the United States announced it was planning to destroy *USA-193* (a.k.a. *NROL-21*), a derelict satellite that was decaying out of orbit and falling back to Earth.⁵ On February 21, 2008, the United States successfully destroyed *USA-193* at an altitude of approximately 133 miles with a kinetic ASAT missile.⁶

In the wake of these State actions, the question is raised: What, if any, affirmative legal obligations does Article IX of the Outer Space Treaty⁷ impose on States Party to the Treaty planning to or carrying out ASAT (anti-satellite) activities or experiments in outer space? Did China and the United States act in accordance with Article IX?

In the following article, these questions are assessed under a methodology of treaty interpretation consistent with the Vienna Convention on the Law of the Treaties. The negotiating history and historical contest of Article IX and the Outer Space Treaty are examined. Article IX is assessed within a matrix of principles and corresponding articulations of affirmative obligations. This assessment is then applied to the facts publicly known regarding the *FY-1C* and *USA-193* intercept for the purpose of concluding whether or not Article IX obligations were applicable and if applicable whether they were fulfilled. Finally, conclusions are reached as to the Article IX legality of the *FY-1C* and *USA-193* intercepts and discussed within the greater context of international law and governance.

II. TREATY INTERPRETATION METHODOLOGY

All too often analyses of treaty obligations are written without first defining the methodology of treaty interpretation adopted for the analyses. This can result in the discussion be-

⁵ U.S. Department of Defense News Transcript, *DoD News Briefing with Deputy National Security Advisor Jeffrey, Gen. Cartwright and NASA Administrator Griffin*, Feb. 14, 2008 [hereinafter *DoD News Briefing*].

⁶ Thom Shanker, *Missile Strikes a Spy Satellite Falling From Its Orbit*, NEW YORK TIMES (Feb. 21, 2008), <http://www.nytimes.com/2008/02/21/us/21satellite.html?ex=1361336400&en=ea5702ff269483cc&ei=5088&partner=rssnyt&emc=rss>.

⁷ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter *Outer Space Treaty*].

ing directed not to the question of interpretation methodology and law, but instead on presumptions formulated from premises neither party articulates. Let us avoid this pitfall by defining and adopting a method of treaty interpretation.

Numerous methods of treaty interpretation exist. Common methodologies include the textual, subjective, and teleological approaches, and variants thereof.⁸ Often no single approach is adopted, but rather an amalgam of two or more approaches. Common among these approaches is the shared premise that “the validity of an international agreement rests solely on the will or consent of the parties to be bound and, thereof, treaty interpretation is the process of attempting to establish the context of the consent.”⁹

The standard method of treaty interpretation, as adopted by the International Court of Justice, is articulated in Articles 31 and 32 of the Vienna Convention on the Law of the Treaties.¹⁰ Articles 31 and 32 are considered by the Court as having attained the status of customary international law.¹¹ Article 31, General Rule of Interpretation, states:

1. A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.
2. The context for the purpose of the interpretation of a treaty shall comprise, in addition to the text, including its preamble and annexes:
 - (a) any agreement relating to the treaty which was made between all the parties in connection with the conclusion of the treaty;

⁸ Francis Jacobs, *Varieties of Approach to Treaty Interpretation: With special reference to the Draft Convention on the Law of Treaties before the Vienna Diplomatic Conference*, 18 INT. AND COMP. L. QUART. 318, 319 (1969).

⁹ Kenneth Vandervelde, *Treaty Interpretation from a Negotiator's Perspective*, 21 VAND. J. TRANSNAT'L L. 281, 287 (1988).

¹⁰ Vienna Convention on the Law of Treaties, May 23, 1969, 1155 U.N.T.S. 331.

¹¹ ANTHONY AUST, *MODERN TREATY LAW AND PRACTICE* 232 (2d ed., (Cambridge University Press, 2d ed., 2007).

(b) any instrument which was made by one or more parties in connection with the conclusion of the treaty and accepted by the other parties as an instrument related to the treaty.

3. There shall be taken into account, together with the context:

(a) any subsequent agreement between the parties regarding the interpretation of the treaty or the application of its provisions;

(b) any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation;

(c) any relevant rules of international law applicable in the relations between the parties.

4. A special meaning shall be given to a term if it is established that the parties so intended.

Article 32, Supplementary Means of Interpretation, states:

Recourse may be had to supplementary means of interpretation, including the preparatory work of the treaty and the circumstances of its conclusion, in order to confirm the meaning resulting from the application of article 31, or to determine the meaning when the interpretation according to article 31:

(a) leaves the meaning ambiguous or obscure; or

(b) leads to a result which is manifestly absurd or unreasonable.

As articulated in Article 31(1), the Vienna Convention adopts first and foremost an objective textual approach based on the premise of a neutral third party observer. Although focused on the textual approach, the Convention is not strictly textual as both subjective and teleological approaches are included within the methodology of the articles.¹² Inherent in the objective textual approach is the recognition that “the primary aim of international law is not to provide the ideal method of resolving

¹² Jacobs, *supra* note 8.

disputes, but to prevent disputes from arising.”¹³ The objective textual approach prioritizes clear, simple, and precise resolution of interpretative dispute. As a result, subjective intent articulated in the preparatory work and circumstances of conclusion is subjugated as a supplementary means of interpretation.

For the purposes of the analysis in this article, the Vienna Convention is adopted as the methodological approach of treaty interpretation subject to the following caveat. While the Convention does provide a reasonable method of interpretation, the Outer Space Treaty warrants Article 32 of the Convention to play a more prominent role than perhaps it would otherwise when interpreting other treaties.

With the exception of Article IV of the Outer Space Treaty and provisions related to procedural aspects of it, all other Treaty articles are articulations, and in some cases verbatim copies, of the principles articulated in GA Res 1962 (XVIII), *Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space*.¹⁴ As a result, the Outer Space Treaty is primarily a treaty of principles, crafted for the purposes of *proscribing* norms to an area that was *without law*. These proscriptive principles, by their very nature, cannot embody their object and purpose by solely reviewing their text. It is for this reason that the historical circumstance of human advancement into outer space is closely intertwined with the object and purpose of these principles.

Article 32 of the Vienna Convention does allow for supplementary means of interpretation, including the preparatory work of the treaty and the circumstances of its conclusion, in order to confirm the meaning resulting from the application of Article 31. When interpreting the Outer Space Treaty, confirmation of the meaning of text should be undertaken with an examination of the preparatory work of the treaty and circumstances of its conclusions.

¹³ Vandervelde, *supra* note 9 at 342.

¹⁴ Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, GA Res. 1962(XVIII) [hereinafter Declaration].

III. HISTORICAL CONTEXT OF ARTICLE IX

Prior to assessing Article IX obligations, it is necessary to have an understanding of the historical process that led to Article IX and the Outer Space Treaty. Therefore let us examine, in a chronological order, the historical development of the Article.

Important Historical Events related to Article IX of the Outer Space Treaty

Year	Sputnik Launched [1957]	Project Westford Initiated GA RES. 1721 (XVI) [1961]	Project Westford (Cont.) Limited Test Ban Treaty GA RES.1962 (XVIII) [1963]	Treaty Signed [1967]
[1945]				
U.N. Charter				
	[1958]		[1962]	[1966]
	GA RES.1338(XIII) First High Altitude Nuclear Test			USA & U.S.S.R. begin treaty negotiations

A. *U.N. Charter, Sputnik, HANDs, and Project West Ford*

The UN Charter entered into force on October 24, 1945. Article 13(a) of the Charter grants to the General Assembly authority to initiate studies and make recommendations for the purpose of “promoting international co-operation in the political field and encouraging the progressive development of international law and its codification.”¹⁵

On October 4, 1957, the former Soviet Union launched *Sputnik*, the first manmade satellite, into orbit. The launch of *Sputnik* accentuated the debate on what law, if any, does apply to outer space, and on what law, if any, should apply. The United Nations General Assembly took action on December 13, 1958, and in accordance with their authority under Article 13(a) of the Charter, passed GA Res. 1348(XIII).¹⁶ This resolution established the ad hoc Committee on Peaceful Uses of Outer Space (COPUOS) and tasked the Committee to report to the General Assembly on “the nature of legal problems which may arise in the carrying out of programs to explore outer space.”¹⁷

¹⁵ U.N. Charter art 13(a).

¹⁶ Question of the Peaceful Use of Outer Space, GA Res. 1348 (XIII) (1958).

¹⁷ *Id.* at para. (1)(d).

COPUOS was established as a full committee on December 12, 1959.¹⁸

1958 was also the first year of high altitude nuclear detonations (HAND). From 1958 until 1962 the United States and Soviet Union conducted a series of HANDs. These nuclear tests affect the operation of applications that utilize outer space and the Earth's atmosphere. The COPOUS Scientific and Technical Sub-Committee considered high altitude and outer space nuclear weapon tests one aspect of potentially harmful space interference that needed to be addressed.¹⁹

In 1961 the General Assembly articulated two principles that were later incorporated into the Outer Space Treaty: "International law, including the Charter of the United Nations, applies to outer space and celestial bodies" and "outer space and celestial bodies are free for exploration and use by all States in conformity with international law and are not subject to national appropriation."²⁰

Also in 1961 the United States initiated *Project West Ford*, a space communications experiment. *Project West Ford* involved placing hundreds of millions of small copper dipoles into orbit²¹ for the purpose of investigating the technical feasibility of using such dipoles as passive reflectors for communications.²² *Project West Ford* raised concerns amongst the international community that the copper dipoles could cause potentially harmful interference with radio astronomy, optical astronomy, space communications, and space travel.²³ The International Astronomical Union (IAU) passed a resolution appealing "to all governments . . . launching space experiments which could possibly affect as-

¹⁸ International Cooperation in the Peaceful Uses of Outer Space, GA Res. 1472(XIV) (1959).

¹⁹ Opening Statement by the Chairman, GA 18th Sess., Annex II, para. (e). UN Doc. A/5482 (1963) at 10. See also, *The Peaceful Uses of Outer Space*, in 1962 UNITED NATIONS YEARBOOK 42 (1962) [hereinafter UNITED NATIONS YEARBOOK].

²⁰ International Cooperation in the Peaceful Uses of Outer Space, GA Res. 1721(XVI) (1961).

²¹ See C.F.J. Overhage & W.H. Radford, *The Lincoln Laboratory West Ford Project – An Historical Perspective*, in 52 (5) PROC. OF THE IEEE 452-54 (May 1964) [hereinafter *The Lincoln Laboratory*].

²² KARL-HEINZ BOCKSTIEGEL ET AL., *United States Space Communication Experiment*, in SPACE LAW BASIC LEGAL DOCUMENTS, at A.IX.1.2 (2007).

²³ See *The Lincoln Laboratory*, supra note 21.

tronomical research to consult with the IAU before undertaking such experiments and to refrain from launching until it is established beyond doubt that no damage will be done to astronomical research.”²⁴ The International Council of Scientific Unions (ICSU) Committee on Space Research (COSPAR) established the Consultative Group of Potentially Harmful Effects of Space Experiments (CGPHESE). CGPHESE conducted a study of *Project West Ford* and recommended that “any proposals for future experiments of this sort” should be evaluated thoroughly by the scientific community.²⁵ It was within this historical context that in 1962 the Soviet Union submitted the first draft declaration in COPUOS to address the issue of harmful interference.

B. COPUOS and General Assembly Resolution 1962(XVIII)

GA Res. 1962(XVIII), the progenitor to the Outer Space Treaty, was drafted in 1962 and 1963. This drafting process involved members of COPUOS circulating a series of draft declarations and negotiating amongst themselves to achieve consensus on a declaration that could be transmitted to the First Committee of the General Assembly.

On June 6, 1962, the Soviet Union submitted a draft declaration to be considered by COPUOS (U.S.S.R. Draft). The U.S.S.R. Draft contained a provision that stated in paragraph 6: “Co-operation and mutual assistance in the conquest of outer space shall be a duty incumbent upon all States; the implementation of any measures that might in any way hinder the exploration or use of outer space for peaceful purposes by other countries shall be permitted only after prior discussion of and agreement upon such measures between countries concerned.”²⁶

²⁴ DELBERT TERRILL, *THE AIR FORCE ROLE IN DEVELOPING INTERNATIONAL OUTER SPACE LAW* 65 (Maxwell Air Force Base: Air University Press, 1999) (quoting R. Cargill Hall, *The International Legal Problems in Space Exploration, An Analytical Review* 41-42 (June 1966) (unpublished master’s thesis, California State University at San Jose)).

²⁵ Z. Niemirowicz, *A Marriage to COSPAR: Part I – 1957-1967*, 1993 COSPAR INFORMATION BULLETIN 77-88.

²⁶ U.S.S.R. Draft Declaration of the Basic Principles Governing the Activities of States in the Exploration and Use of Outer Space, GA 18th Sess., Annex III, para.6. UN Doc. A/5482 at 11 (1963) [hereinafter Draft Declaration].

The U.S.S.R. Draft met resistance from the U.K. and the United States.²⁷ The U.K. and United States maintained that the U.S.S.R. Draft “introduced a veto on the activities of other in outer space” and seemed less effective than action already taken by COSPAR, which had established CGPHESE.²⁸ France “agreed with the idea of consultations between States engaged in the exploration of outer space in order not to obstruct outer space activities of other States” but “objected to making prior consent imperative for the such activities by another State.”²⁹

On December 4, 1962, the U.K. submitted to COPUOS a draft declaration (U.K. Draft) that responded to the Soviet position. The U.K. Draft contained a provision that stated exploration and use of outer space “shall be exercised by all States with due regard to the interests of other States in the exploration and use of outer space, and to the need for consultation and co-operation between States in relation to such exploration and use.”³⁰ This draft differed from the U.S.S.R. Draft in two significant ways. First, while the U.S.S.R. Draft spoke of mutual assistance and co-operation as a duty, the U.K. Draft articulates the principle of due regard. Second, the U.K. draft did not require prior consent, nor did it place an affirmative duty to consult. Instead the U.K. draft simply spoke of the need for consultation and co-operation.

Ultimately COPUOS adopted a provision that struck a balance between the U.S.S.R. draft and the U.K. draft, similar to the position articulated by France. Paragraph 6 of *Declaration of Legal Principles Governing the Activities of Outer Space* (Declaration) states:

In the exploration and use of outer space, States shall be guided by the principle of co-cooperation and mutual assistance and shall conduct all their activities in outer space with due regard for the corresponding interests of other States. If a State has reason to believe that an outer space activity or experiment planned by it or its nationals would cause potentially

²⁷ UNITED NATIONS YEARBOOK, *supra* note 19, at 42.

²⁸ *Id.*

²⁹ *Id.*

³⁰ Draft Declaration, *supra* note 26, at 11.

harmful interference with activities of other States in the peaceful exploration and use of outer space, it shall undertaken appropriate international consultations before proceeding with any such activity or experiment. A State which has reason to believe that an outer space activity or experiment planned by another State would cause potentially harmful interference with activities in the peaceful exploration and use of outer space may request consultation concerning the activity or experiment.³¹

As will be discussed in further detail below, the language of the Declaration imposes an affirmative duty to consult but does not require prior consent. The Declaration was adopted by the General Assembly on December 13, 1963, as GA Res. 1962(XVIII).

*Comparison of Draft Declarations and the Evolution of
Paragraph 6 GA Res. 1962 (XVIII)*

U.S.S.R. Draft Declaration June 6th, 1962	U.K. Draft Declaration December 4th, 1962	Draft Declaration accepted by consensus and adopted as G.A. Res. 1962 (XVIII)
<ul style="list-style-type: none"> • Prior consent required for "any measures that might in any way hinder the exploration and use of outer space" • Duty of "cooperation and mutual assistance" 	<ul style="list-style-type: none"> • Due regard to the interests of other States in the exploration and use of outer space • The "need for consultation and cooperation between States in relation to such exploration and use" 	<ul style="list-style-type: none"> • Due regard for the corresponding interests of other States • Appropriate international consultations required for activities planned that State has reason to believe "would cause potentially harmful interference with activities of other States in the peaceful exploration and use of outer space"

³¹ Declaration, *supra* note 14, at para. 6.

C. *Limited Test Ban Treaty*

The Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water (Limited Test Ban Treaty) entered into force on October 10, 1963. This treaty addressed one issue of potentially harmful interference—the detonation of nuclear devices in the atmosphere and in outer space. Each Party to the the Limited Test Ban Treaty undertakes “to prohibit, to prevent, and not to carry out nuclear wepaon test exploration, or any other nuclear exposition, at any place under its jurisdiction or control” in the atmosphere and beyond its limits, including outer space.³²

D. *Outer Space Treaty and Article IX*

The Outer Space Treaty was negotiated in COPUOS in 1966 and entered into force October 10, 1967. With the exception of the harmful contamination clause, the operative language of Article IX is a verbatim copy of GA Res. 1962 (XVIII) paragraph 6.³³ The harmful contamination provision was proffered by Canada during the 1962-1963 COPUOS negotiations on the *Declaration of Principles*, but was not included in the final draft Declaration.³⁴ Canada voiced concern that with the exclusion of a harmful contamination provision from the *Declaration* a Party “is not specifically asked to undertake consultation if an experiment planned by it or its nationals might involve a risk of modifying the natural environment of the Earth in a manner likely to be prejudicial for the well-being of human life or the interests of another State.”³⁵

³² Treaty Banning Nuclear Weapon Tests in Atmosphere in Outer Space and Under Water, Oct. 10, 1963, 480 U.N.T.S. 43.

³³ Article IX of the Outer Space Treaty added additional language to formulate ¶ 6 of GA Res.1962(XVI) to ensure enforceability as a treaty provision (“State Party to the Treaty”) and to clarify the scope of outer space to include the moon and other celestial bodies. *See* Outer Space Treaty, *supra* note 7, at art. IX.

³⁴ Verbatim Record of the 24th meeting of COPUOS, Nov. 22, 1963, Doc. A/5549/Add.1 Annex 1 at 17.

³⁵ *Id.*

During the course of the 1966 Outer Space Treaty negotiations, a harmful contamination provision was added and Article IX of the Treaty was adopted as follows:

In the exploration and use of outer space In the exploration and use of outer space, including the Moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of co-operation and mutual assistance and shall conduct all their activities in outer space, including the Moon and other celestial bodies, with due regard to the corresponding interests of all other States Parties to the Treaty. States Parties to the Treaty shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose. If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A State Party to the Treaty which has reason to believe that an activity or experiment planned by another State Party in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, may request consultation concerning the activity or experiment.

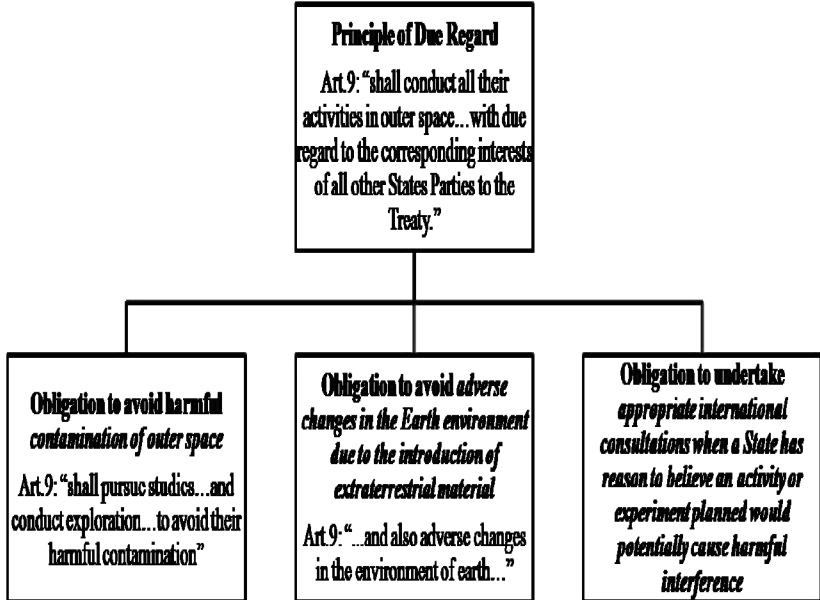
IV. LEGAL INTERPRETIVE ANALYSIS OF ARTICLE IX OBLIGATIONS

Activities in outer space are governed by the principle of due regard as articulated in the first sentence of Article IX, which states: "In the exploration and use of outer space, including the Moon and other celestial bodies, States Parties to the Treaty...shall conduct all their activities in outer space, including the Moon and other celestial bodies, with due regard to the

corresponding interests of all other States Parties to the Treaty.”

The second and third sentences of Article IX elaborate upon the principle of due regard and prescribe three *proscriptive* positive legal obligations. First, studies and exploration are to be conducted so as to avoid harmful contamination of outer space. Second, studies and exploration are to be conducted so as to avoid adverse changes in the environment of Earth from the introduction of extraterrestrial matter. Third, appropriate international consultations shall be undertaken before proceeding with any activity or experiment that a State has reason to believe would cause potentially harmful interference with activities of other States in the peaceful exploration and use of outer space. The matrix below illustrates the relationship of these obligations.

Matrix of Article IX Positive Obligations



It is important to note that Article IX does not distinguish between military and civilian activities, therefore the requirements of Article IX apply fully to military activities in space.³⁶ The application of Article IX to military activities is however subject to the Charter of the United Nations and general international law, including international law governing armed conflict.³⁷ As such, in certain situations Article IX obligations may be preempted by other norms of international law.³⁸

A. Obligation to Undertake Appropriate International Consultations

Article IX of the Outer Space Treaty contains a mandatory international consultation clause that states:

If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment.³⁹

In order for a State to be under an obligation to undertake international consultations, three conditions must be satisfied:

- 1) There is an activity or experiment in outer space (e.g. an ASAT activity or test), including the Moon and other celestial bodies, planned by the State or its nationals;⁴⁰ and,

³⁶ Robert Ramey, *Armed Conflict on the Final Frontier: The Law of War in Space*, 48 A.F. L. REV. 1, 76-77 (2000).

³⁷ See Outer Space Treaty, *supra* note 7, at art. III.

³⁸ For example, ASAT activities or experiments conducted during a time of armed conflict sanctioned under international law, directed against a belligerent, or sanctioned by the U.N. Security Council necessary for the maintenance of international peace and security may be governed by norms of international law that preempt Article IX positive obligations. See Ramey, *supra* note 36. See also Michel Bourbonniere, *National-Security Law in Outer Space: The Interface of Exploration and Security*, 70 J. AIR L. & COM. 3, 7-14 (commenting that "the Outer Space Treaty was not meant to change the law governing means and methods of warfare.").

³⁹ See Outer Space Treaty, *supra* note 7, at art. IX.

⁴⁰ *Id.*

2) The State must have reason to believe the activity or experiment (e.g. an ASAT activity or test) would cause potentially harmful interference;⁴¹ and,

3) That this potentially harmful interference must potentially interfere with the activities of other States Parties to the Outer Space Treaty in the peaceful exploration and use of outer space, including the Moon and other celestial bodies.⁴²

i. Condition 1: Activity or Experiment in Outer Space

The terms “activity,” “experiment,” “outer space,” and “planned” are not defined by the Treaty. The term activity is more encompassing than experiment, as an experiment is only one type of activity that can be undertaken. Thus, except for actions excluded from the scope of Article IX by preemptive norms of international law, the term activity can be reasonably interpreted as any action.

Outer space is not defined under international law and some dispute may arise as to whether the spatial location of an activity is occurring within outer space or airspace.⁴³ Also, there is a question as to whether or not an activity or experiment that is terrestrial based is also within the scope of the term “in outer space.” For example, is an ASAT experiment that targets ground based satellite uplinks to disrupt the operation of orbiting satellites an experiment that is occurring in outer space or is it simply a terrestrial experiment that impacts an object in outer space?

“Planning” for something incorporates an element of premeditation and intent. An unplanned activity or experiment in outer space is possible, although highly unlikely.⁴⁴ If an unplanned activity or experiment did occur, the international con-

⁴¹ *Id.*

⁴² *Id.*

⁴³ For example, a high-altitude activity or experiment may be protested against by a subjacent State on the grounds that the activity or experiment is occurring within the State’s sovereign airspace even though no legal delimitation of air and space is established under international law.

⁴⁴ As humankind increases outer space utilization, the likely of accidental (e.g. unplanned) outer space activities or experiment will likewise increase, with some level of correlation proportional to use.

sultation clause would not apply. This is a reasonable interpretation because international consultations are required before proceeding with an activity or experiment and one cannot undertake consultations for an activity or experiment they did not plan or intend to conduct.

ii. Condition 2: Reason to Believe that the Activity or Experiment would cause Potentially Harmful Interference

The terms “has reason to believe,” “would cause,” “potentially,” and “harmful interference” are also not defined in the Treaty. “Reason to believe,” when read in conjunction with “would cause potentially harmful interference,” is indicative of a burden of proof threshold. Reason to believe is not synonymous with certainty and one can exclude certainty of potentially harmful interference as the appropriate interpretation of this provision. “To believe,” in this context, is related to holding an opinion or thought.⁴⁵ “Reason,” when read in conjunction with “to believe” is commonly understood to be a statement of some fact employed to prove or disprove some assertion, idea, or belief.⁴⁶ Therefore, reason to believe should be interpreted as having knowledge that proves the assertion that a planned activity would cause potentially harmful interference.

This language “has reason to believe” raises interesting questions. Is this standard of “reason to believe” a subjective or objective standard? If it is subjective, how does a State determine if it has reason to believe? If it is objective, what body decides? These questions illuminate the *principled* nature of the Treaty and illustrate that Article IX was designed to *guide* and provide *proscriptive* general rules of conduct.

“Would cause” is self-explanatory to the extent that the planned activity would result in potentially harmful interference. The potentiality element of the phrase “potentially harmful interference” is abstruse. As one cannot predict with certainty the results of an action before the action is carried out, attempting to predict whether or not a space activity or experi-

⁴⁵ 1 THE SHORTER OXFORD DICTIONARY, (1993).

⁴⁶ *Id.*

ment will cause harmful interference is difficult. At the time the phrase “potentially harmful interference” was negotiated, significant concern existed that the planned, but yet conducted, second *Project West Ford* experiment would result in harmful interference to space activities. Furthermore, *Project West Ford’s* purpose was to discover what result, be it interference or otherwise, the dispersal of copper dipoles would have on radio communications. In this sense, the term “potentially” expands the reading of the provision beyond planned actions or experiments that *would* cause harmful interference; and instead encompasses activities and experiments that would cause interference that is potentially harmful.

This in turn leads to the question of what is “harmful interference.” Harmful is ordinarily defined as “of a kind likely to be injurious.”⁴⁷ “Interference” is ordinarily defined as an obstruction or hindrance.⁴⁸

Harmful interference in outer space can be divided into three primary categories: (1) Observational Interference (i.e. either terrestrial based astronomical observations or space based terrestrial observations), (2) Radio Frequency Interference, and (3) Physical Interference (i.e. interference with the freedom of physical movement and/or physical operations in outer space). The ITU defines harmful interference as “interference, which endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communication service operating in accordance with Radio Regulations.”⁴⁹ The ITU definition fits within the category of radio frequency interference.

Read together, the operative language of “has reason to believe that an activity or experiment...would cause potentially harmful interference” places the responsibility and authority to determine whether a State has reason to believe and whether the planned action would cause potentially harmful interference

⁴⁷ MERRIAM-WEBSTER’S ONLINE DICTIONARY, <http://www.m-w.com/dictionary/harmful> (last visited Oct. 21, 2008).

⁴⁸ THE SHORTER OXFORD DICTIONARY, *supra* note 45.

⁴⁹ Bourbonniere, *supra* note 38, at 57 (quoting the Convention of the International Telecommunication Union, Dec. 22, 1992, S. Treaty Doc. No. 104-34 (1996)).

with the State charged with the affirmative obligation to consult. As will be discussed in further detail *below*, this in turn allows States a wide degree latitude to determine whether or not this triggering condition is met.

iii. Condition 3: Potentially Harmful Interference with the Peaceful Exploration and Use of Outer Space

Condition 3 requires potentially harmful interference to interfere with the peaceful exploration and use of outer space of other State Parties. This raises the question of whether or not other State Party activities meet the criteria of peaceful use and exploration. If the exploration and use of other States Party to the Treaty are not peaceful, then there is no obligation to undertake appropriate international consultations with regards to potentially harmful interference of non-peaceful use and exploration of outer space. For example, an experiment that would cause potentially harmful interference with a space object of a State Party carrying nuclear weapons in orbit would not trigger Condition 3, so long as the orbiting nuclear weapons are not sanctioned under international law.

iv. What are Appropriate International Consultations?

The Treaty neither proscribes the procedure for appropriate international consultations nor designates an agency to which States should turn for the authoritative evaluation of proposed uses or experiments.⁵⁰ As a result, the procedure and substantive nature of “appropriate international consultations” will depend on the nature of the planned activity or experiment.⁵¹ One can logically infer that a State is procedurally obligated, at

⁵⁰ Ivan Vlasic, *The Space Treaty: A Preliminary Evaluation*, 55 CAL. L. REV. 507, 517. Also, consider that during the negotiations of GA Res.1962 (XVIII), Australia, Brazil and India suggested that international consultations could be explicitly linked with international forums existing at the time, such as COSPAR’s CGPHESE. The United States considered the CGPHESE an appropriate forum for consultation but argued it would be inappropriate to specify one particular mode of conducting international consultations exclusively and for all time. Ultimately, the position of the United States prevailed.

⁵¹ See Brandon Hart, *Legal Implications Surrounding Recent Interception of Spy Satellite*, JOINT CENTER FOR OPERATIONAL ANALYSIS (JCOA) J. 34 (June 2008).

minimum, to contact States Parties to the Treaty whose peaceful explorations and use of outer space would experience potentially harmful interference. One can also logically infer that the substantive obligation requires, at minimum, that these States be provided with information sufficient to take appropriate action to prevent potentially harmful interference with their uses or explorations in outer space, the Moon and other celestial bodies.

Consider that the object and purpose of Article IX is guided by principles of “cooperation and mutual assistance” with “due regard to the corresponding interests of all other States Parties to the Treaty.”⁵² Interpreting the international consultation obligation provision as *ad minimum* requiring a State to fulfill the aforementioned procedural and substantive obligations is a good faith interpretation of the Treaty given the terms of the Treaty in their context and in the light of its object and purpose. Imposing any less of an obligation would emasculate the international consultation clause of Article IX, a result that is unreasonable.

B. Obligation to Avoid Harmful Contamination

Article IX contains a harmful contamination clause that states: “States Parties to the Treaty shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination”⁵³

The Treaty does not define harmful contamination. Harmful is ordinarily defined as “of a kind likely to be injurious.”⁵⁴ Contamination is ordinarily defined as “to make unfit for use by the introduction of unwholesome or undesirable elements.”⁵⁵ One can conclude that harmful contamination of outer space is the introduction of elements that make outer space unfit for use or are likely to be injurious to users of outer space.

⁵² See Outer Space Treaty, *supra* note 7, at art. IX.

⁵³ *Id.*

⁵⁴ See MERRIAM-WEBSTER'S ONLINE DICTIONARY, *supra* note 47.

⁵⁵ *Id.*

Article IX does not prohibit harmful contamination of outer space. Instead states are obligated only to *avoid* harmful contamination. The Treaty is silent on appropriate measures or authoritative evaluations to determine whether a State has taken appropriate measures to avoid harmful contamination. Until State practice more clearly establishes appropriate standards for the avoidance of harmful contamination, States are granted a wide degree of latitude to determine what action is appropriate. State action is restricted to the extent that their actions must be conducted in good faith in accordance with the principles of the Treaty and international law.

C. Obligation to Avoid Adverse Changes in the Environment of the Earth

Article IX obligates States to pursue studies and exploration of outer space to avoid “adverse changes in the environment of the Earth resulting from introduction of extraterrestrial matter, and where necessary, shall adopt appropriate measures for this purpose.” This provision, in and of itself, is substantively lacking.

The verb “avoid” does not prohibit adverse changes. The adjective “adverse” qualifies the “change” that is to be avoided. Only change resulting from one specific cause, the introduction of extraterrestrial matter, is addressed. A literal interpretation of this provision excludes adverse changes to the Earth’s environment resulting from space based electromagnetic radiation sources, the blocking or interference of solar emissions, gravitational and magnetic fields, and other forms of energy that are not considered “extraterrestrial matter.”

V. ARTICLE IX ANALYSIS OF *FY-1C* AND *USA-193* ASAT ACTIVITIES

In the following section the *FY-1C* and *USA-193* ASAT activities are assessed in light of Article IX of the Outer Space Treaty. This assessment determines whether or not the obligation for international consultation was applicable and if applicable whether the obligation was fulfilled. Article IX obligations to avoid harmful contamination of outer space are also assessed.

A. *FY-1C*

On January 11, 2007, China conducted an ASAT test which resulted in the destruction of the *Feng Yun 1C (FY-1C)* weather satellite in polar orbit at an altitude of approximately 537 miles. This was the first such destruction of a satellite since the kinetic ASAT missile tests conducted during the Cold War by the United States and the Soviet Union.⁵⁶ Prior to conducting the *FY-1C* ASAT experiment on January 11, 2007, China did not take any steps to consult or inform the international community. Following the *FY-1C* ASAT test, Britain, Australia, Canada, Japan, Taiwan, India, South Korea and the European Union joined the United States in protesting and calling upon Beijing for consultations.⁵⁷ It was not until January 23, 2007, that China publicly confirmed it had conducted the ASAT experiment.⁵⁸

i. International Consultation Obligation

Was China obligated to conduct international consultation, and if so did China satisfy this obligation?

As previously discussed, before a State is obligated to undertake international consultations three conditions must be satisfied: (1) There is an activity or experiment in outer space (e.g. an ASAT activity or test), including the Moon and other celestial bodies, planned by the State or its nationals,⁵⁹ (2) the State must have reason to believe the activity or experiment (e.g. an ASAT activity or test) would cause potentially harmful interference,⁶⁰ and (3) that this potentially harmful interference must potentially interfere with the activities of other States Parties to the Outer Space Treaty in the peaceful exploration

⁵⁶ Kan, *supra* note 4.

⁵⁷ Theresa Hitchens, *US-Sino relations in Space: From "War of Words" to Cold War in Space*, 3 CHINA SECURITY 12, 23 (2007).

⁵⁸ *China Confirms Satellite Downed*, BBC NEWS REPORT (Jan. 23, 2007), <http://news.bbc.co.uk/2/hi/asia-pacific/6289519.stm>.

⁵⁹ See Outer Space Treaty, *supra* note 7, at art. IX.

⁶⁰ *Id.*

and use of outer space, including the Moon and other celestial bodies.⁶¹

On January 11th, 2007, China conducted a kinetic ASAT experiment against the weather satellite, *FY-1C*, operating in a polar orbit. An ASAT test against an orbiting satellite falls within a good faith interpretation of “activity or experiment in outer space.”⁶² Therefore, the first condition triggering mandatory international consultation is satisfied.

A successful ASAT test against an orbiting satellite with a kinetic kill vehicle will result in the destruction of the targeted satellite and the creation of dangerous fast-moving space debris. The resulting space debris is harmful interference that has the potential to damage or destroy other objects in outer space, in particular objects operating in similar orbits or intersecting orbits. The destruction of *FY-1C* is a large space debris generating event, with thousands of pieces of debris cataloged by the United States Space Surveillance Network.⁶³ Furthermore, due to the altitude and orbital mechanics of *FY-1C*, this debris threatens all spacecraft flying below 2,000 km and will remain in orbit for decades.⁶⁴ As a result, this debris caused and is causing potentially harmful interference with the activities of the International Space Station, the Space Shuttle, and other space objects in polar orbit and LEO which were and are conducting peaceful exploration and use of outer space.⁶⁵ This harmful interference can be categorized as physical interference with physical movement and/or operation of vehicles and personnel in outer space.

The Chinese should have had “reason to believe” that the successful destruction of *FY-1C* would create a debris field that would cause potentially harmful interference. The Chinese are

⁶¹ *Id.*

⁶² *Id.*

⁶³ *Id.* See also The Space Security Index 2007 at 6 (Waterlo, Canada: Project Ploughshares, 2007) at 6.

⁶⁴ Frank Moring, *China ASAT Test Called Worst Single Debris Event Ever*, AVIATION WEEK AND SPACE TECHNOLOGY (Feb. 11, 2007), http://www.aviationweek.com/aw/generic/story_generic.jsp?channel=space&id=news/aw021207p2.xml&headline=China%20Asat%20Test%20Called%20Worst%20Single%20Debris%20Event%20Ever.

⁶⁵ *Id.*

sophisticated enough to conduct an ASAT test against an orbiting satellite, are aware of the basic laws of physics that underlies kinetic ASATs and the motion of objects in outer space, and therefore have sufficient knowledge to conclude that their planned activity would create space debris and that resulting debris field would be long lasting and threaten spacecraft over a range of orbits. Of course, it can still be argued that subjectively the Chinese assessed prior to conducting the experiment that there was no reason to believe potentially harmful interference would occur. The weakness of this position is an implied presumption of certainty as to the potentiality of harmful interference. To argue that one had *no reason to believe* that *potentially* harmful interference would occur is beyond the standards of good faith and due regard that are foundation of Article IX.

Interpretation of treaty obligations can be construed either broadly or narrowly. States often interpret agreements to provide greatest latitude of State freedom of action. However, even if Article IX is interpreted broadly for the purpose of providing State freedom of action, the principle of due regard and good faith, when read in conjunction with terms of the Treaty in light of its object and purpose, cannot justify an interpretation that concludes China did not have “reason to believe” not “reason to know,” but only the “reason to believe.”

It is on these grounds that the Chinese “had reason to believe” and the second condition triggering mandatory international consultation obligation is satisfied.

Other States Party to the Treaty, including the United States, were peacefully using and exploring outer space in polar orbits or intersecting LEO orbits with *FY-1C* on January 11, 2007. The peaceful exploration and uses of space within these orbits are diverse, ranging from the *International Space Station* to weather satellites. On this basis the third condition triggering mandatory international consultations under Article IX is satisfied.

Since these three conditions were met prior to China conducting the *FY-1C* ASAT experiment, China was obligated to conduct appropriate international consultations. These international consultations were obligated to be conducted appropriately with other States Parties to the Treaty that China had

reason to believe the *FY-1C* ASAT experiment would cause potentially harmful interference to their respective peaceful uses and exploration of outer space.

China did not take any steps to consult or even inform any such States Party to the Treaty *prior* to conducting the *FY-1C* ASAT experiment. It was not until January 23, 2007, that China publicly confirmed it had conducted the ASAT experiment.⁶⁶ The Treaty grants States broad discretion by not defining appropriate international consultations. However, as discussed above, ad minimum it can be inferred that appropriate international consultations is the transmission of information to potentially affected States that is sufficient for affected States to take appropriate action to prevent potentially harmful interference with their activities or experiments. China took *no action* prior to conducting the *FY-1C* ASAT experiment, not even *informing* potentially affected States of the upcoming activity. China's nonfeasance was a violation of Article IX's obligation to conduct appropriate international consultations.

Prior to January 11, 2007, United States intelligence agencies detected two previous tests of the Chinese ASAT system and weeks before the *FY-1C* ASAT test U.S. intelligence agencies were aware the Chinese were preparing another ASAT test.⁶⁷ This fact raises the question: is the obligation to conduct international consultations affected or voided when States have knowledge of planned activities gained through intelligence apparatus? The answer is no. The international consultation obligation applies whether or not other States have knowledge of planned activities that they gained through intelligence apparatus. The critical point is that Article IX requires States to *consult* and does not distinguish or modify this obligation towards States that have independently gained knowledge of a planned space activity or experiment. The obligation to consult is not modified or negated even though States *may request* consultation concerning an activity or experiment they have reason to

⁶⁶ See BBC NEWS REPORT, *supra* note 58.

⁶⁷ Michael Gordon & David Cloud, *U.S. Knew of China's Missile Test, but Kept Silent*, NEW YORK TIMES (Apr. 23, 2007).

believe would cause potentially harmful inference with activities in the peaceful exploration and use of outer space.

China's violation of the international consultation obligation must be considered in light of State practice. During the Cold War, The United States and Soviet Union experimented with various ASAT weapons. ASAT experiments against orbiting satellites were successfully carried out by the United States and Soviet Union. The last successful kinetic ASAT experiment was carried out by the United States in 1985 on the *Solwind* satellite.⁶⁸ Neither the United States nor the Soviet Union conducted international consultations in accordance with Article IX prior to conducting their kinetic ASAT activities. The Chinese failure to undertake appropriate international consultations prior to conducting their ASAT tests is consistent with the Cold War practices of the United States and Soviet Union.

Do the Cold War practices of the United States and Soviet Union establish an agreement of State Parties to the Treaty to interpret Article IX as not requiring appropriate international consultations prior to conducting kinetic ASAT activities or experiments in outer space? Article 31(3)(B) of the Vienna Convention states: "[t]here shall be taken into account, together with the context...any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation." "It is not necessary to show that each party has engaged in a practice, only that all have accepted it, albeit tacitly."⁶⁹

Let us assume that the U.S. and Soviet kinetic ASAT activities did trigger the obligation to undertake appropriate international consultation. In that case, one can argue that the Cold War practice of the United States and Soviet Union establishes an agreement among States Party to the Treaty to interpret Article IX as not requiring appropriate international consultations prior to conducting kinetic ASAT activities or experiments in outer space. In support of this argument, one can present a lack of objection to the practice as tacit approval by other States

⁶⁸ *Judge Won't Bar Test Firing at Satellite, Expected Today*, NEW YORK TIMES A8 (Sept. 13, 1985).

⁶⁹ AUST, *supra* note 11, at 243.

Party to the Treaty. One can also argue that when taking into account subsequent State practice, more weight should be given to the subsequent practice of States that have actually conducted kinetic ASAT experiments in outer space. To date, only three States (the United States, the former Soviet Union, and China) are known to have conducted such experiments and none of these States presumably undertook appropriate international consultations prior to conducting kinetic ASAT activities or experiments in outer space. It can be argued that the subsequent practices of these three States establish an agreement among Parties that excludes kinetic ASAT tests from Article IX's obligation to conduct appropriate international. It can be further argued that all have accepted it by tacit approval.

While these arguments have merit, they fail to overturn the presumption that States intend to be bound by the terms of their written agreements in accordance with the ordinary meaning to be given to the treaty in their context and in light of its object and purpose.

First, consider that subsequent practice in the application of the treaty is much more effective at establishing agreement as to treaty interpretation when the treaty is bilateral or has a limited number of State Parties and that the Outer Space Treaty has almost half of the world's nations as States Party. While three States have presumably failed to conform to Treaty obligations, no State has formally supported an exclusion of kinetic ASAT tests from Article IX international consultation obligations. Furthermore, there is uncertainty as to what States have or had the technological capacity to monitor, detect, and verify a kinetic ASAT test has occurred and by whom the test was conducted. During the Cold War these technological limitations presumably only allowed a handful of States to verify first-hand an ASAT test occurred. It is unjust to argue tacit approval by States when States did not have independent methods of ASAT test verification.

Also consider that following the *FY-1C* ASAT test, Britain, Australia, Canada, Japan, Taiwan, India, South Korea and the European Union joined the United States in protesting and call-

ing upon Beijing for consultations.⁷⁰ While the lack of objection during the Cold War is an important subsequent practice, so are the objections raised after *FY-1C*.

The reasonable conclusion is that subsequent state practice has not yet established that Article IX's appropriate international consultation obligation excludes consulting for kinetic ASAT activities or experiments in outer space. However, if States continue to perform kinetic ASAT experiments without conducting appropriate international consultations, the argument in favor of subsequent State practice establishing an agreement among States Party to exclude kinetic ASAT activities from Article IX's international consultation provision is strengthened.

ii. Obligation to Avoid Harmful Contamination of Outer Space

Did China satisfy the Article IX obligation to avoid harmful contamination of outer space?

Polar (PO) and low-earth orbits (LEO) are used for a variety of purposes. Remote sensing, manned space flight, communication satellites, the *International Space Station*, and a variety of other space objects and personnel occupy PO and LEO at any given time. The Chinese ASAT test introduced thousands of pieces of potentially hazardous space debris into PO and LEO⁷¹ that will be in the outer space environment, in substantial amounts, for decades.⁷² This space debris has modified the PO and LEO environment making orbits that intercept the Chinese ASAT debris field unfit (or at the least dangerous) for use. Given the amount of debris released, it seems reasonable for this contamination to be considered harmful or of a kind likely to be injurious.

⁷⁰ Hitchens, *supra* note 57, at 23.

⁷¹ See Kelso, *supra* note 3; *China's ASAT Test Will Intensify U.S.-Chinese Standoff*, *supra* note 2; Peter Siegal & James Gertzensang, *Chinese Missile Strikes Satellite*, THE L.A. TIMES, Jan. 19, 2007, [http://www.nytimes.com/2007/01/24/world/asia/24china.html?emc=eta1](http://www.latimes.com/news/nationworld/world/la-fg-satellite19jan19,0,3917551.story?coll=la-homeeadlines>%20and%20Technology%20News%20Daily%20; and Joseph Kahn, China Confirms Space Test; Denies Intent to Intimidate, THE NEW YORK TIMES (Jan. 24, 2007), <a href=).

⁷² Moring, *supra* note 64.

Article IX does not prohibit harmful contamination of outer space. Instead, states are obligated to *avoid* harmful contamination. China only violated this provision if they did not conduct the ASAT test to avoid harmful contamination. Determining whether an action satisfactorily avoided harmful contamination is difficult because the Treaty does not provide the procedure for appropriate international consultations nor designate an agency to which States should turn for an authoritative evaluation.⁷³

Conducting an ASAT test on an orbiting satellite does not in and of itself constitute *unavoidable* harmful contamination of outer space. It is possible that the underlying target or technology of an ASAT test will generate unavoidable space debris. However, kinetic ASAT tests can be conducted against targets in orbits with altitudes and inclinations that would minimize harmful contamination.

It does not appear that the Chinese attempted to modify the target satellite's orbit in order to avoid harmful contamination or minimize the amount of time the resulting debris field would remain in outer space. On this basis, an argument exists that the Chinese did violate the harmful contamination provision of Article IX. However, this argument is tenuous due to the ambiguous and subjective nature of establishing a standard for *avoiding* harmful contamination. Therefore, it cannot be definitively assessed whether the Chinese ASAT test violated the harmful contamination provision of Article IX.

B. USA-193

In January 2008, the United States announced publicly that it had lost control of a satellite, *USA-193* (a.k.a. *NROL-21*), whose orbit was decaying and would eventually bring the satellite into the Earth's atmosphere.⁷⁴ On February 14, 2008, the United States Department of Defense held a news briefing publicly addressing the decay and planned kinetic ASAT intercept of *USA-193*. U.S. officials indicated they were communicating

⁷³ Vlastic, *supra* note 50, at 517.

⁷⁴ Paul Harris, *US warns out-of-control spy satellite is plunging to Earth*, THE OBSERVER, Jan. 27, 2008, www.guardian.co.uk.

with other countries and various organizations (e.g. the U.N., NATO, and ESA) to inform them of the actions the U.S. planned to take regarding *USA-193*. However, the U.S. Deputy National Security Advisor stated:

The United States has certain obligations based on treaties and other agreements related to activities in space. The 1967 U.N. Treaty on Exploration and Use of Outer Space, in particular, calls on states to keep others informed of activities of potential concern. While we do not believe that we meet the standard of Article IX of that Treaty that says we would have to consult in the case of generating potentially harmful interference with other activities in space, we do believe it is important to keep other countries informed of what is happening.⁷⁵

This statement reveals that the United States did not believe the planned intercept of *USA-193* triggered the international consultation provision of Article IX. Was this statement legally accurate or did the planned intercept of *USA-193* trigger the international consultation provision?

The U.S. planned on intercepting *USA-193* with a kinetic ASAT missile just prior to it hitting the Earth's atmosphere.⁷⁶ The U.S. estimated that over 50 percent of debris generated from the interception would be de-orbited within the two orbits. The U.S. did consider whether unmanned bodies in space, in low-Earth orbit, and the space station would be at increased risk of space debris collisions.⁷⁷ The U.S. stated they were planning their activities with "due regard" to the safety of people in orbit.⁷⁸

On February 21, 2008, the U.S. successfully intercepted *USA-193*. In accordance with the Outer Space Treaty and Registration Convention, the United States notified the U.N.⁷⁹ The

⁷⁵ See *DoD News Briefing*, *supra* note 5.

⁷⁶ *Id.*

⁷⁷ *Id.*

⁷⁸ *Id.*

⁷⁹ See Outer Space Treaty, *supra* note 7, at art. XI. See also the Convention on the Registration of Objects Launched into Outer Space, 28 U.S.T. 695, 1023 U.N.T.S. 15.

interception occurred at an altitude of approximately 133 miles.⁸⁰

i. International Consultation Obligation

Did the planned intercept of USA-193 trigger the international consultation provision or was the U.S. correct in asserting that their planned ASAT intercept did not meet the standard of Article IX?

As discussed above, before a State is obligated to undertake international consultations three conditions must be satisfied: (1) There is an activity or experiment in outer space (e.g. an ASAT activity or test), including the Moon and other celestial bodies, planned by the State or its nationals,⁸¹ (2) the State must have reason to believe the activity or experiment (e.g. an ASAT activity or test) would cause potentially harmful interference,⁸² and (3) that this potentially harmful interference must potentially interfere with the activities of other States Parties to the Outer Space Treaty in the peaceful exploration and use of outer space, including the Moon and other celestial bodies.⁸³

It can be argued that the planned intercept of *USA-193* was not going to occur “in outer space.” The failure of international law to delimitate airspace and outer space leaves some ambiguity as to whether the height of the *USA-193* intercept was in outer space. However,

since no State has ever claimed that a satellite orbiting the Earth was infringing its national airspace, it is possible to say that in international law, outer space begins *at least* from the height above the Earth of the lowest perigee of any existing or past artificial satellite that has orbited the Earth without encountering any protest.⁸⁴

On this basis, the intercept of *USA-193* did occur in outer space.

⁸⁰ Kris DeRago, *Military confirms destruction of satellite*, UNIVERSITY WIRE (Feb. 25, 2008).

⁸¹ See Outer Space Treaty, *supra* note 7, at art. IX.

⁸² *Id.*

⁸³ *Id.*

⁸⁴ Christopher M. Petras, “*Space Force Alpha: Military Use of the International Space Station and the Concept of “Peaceful Purposes”*,” 53 A.F.L. REV. 135, 155 (2002).

Article IX only requires international consultations when a State has reason to believe a planned activity or experiment would cause potentially harmful interference with other States Parties in the peaceful exploration and use of outer space. *USA-193*'s intercept was designed to limit the lifetime of space debris generated from the event by conducting the intercept as *USA-193* entered the final stages of a decaying orbit. It is questionable whether the U.S. had reason to believe the planned intercept would cause potentially harmful interference because it was estimated the debris would remain in orbit a short time and that the bulk of the debris would be in an orbit not often utilized. The intercept would definitely have caused interference, but whether or not it gave reason to believe potentially harmful interference with other State activities is not conclusive.

Comparing *USA-193* to *FY-1C*, while the *FY-1C* intercept would certainly generate significant space debris that would remain in orbits that are utilized by other States, the *USA-193* intercept would occur in a decaying orbit, at a low altitude, with a minimal lifetime for space debris generated.

It was concluded above that China should have had reason to believe that their planned experiment would have caused potentially harmful interference. In that analysis, China was appropriately held to the standard that when interpreting and applying Article IX Treaty obligations a State must do so in good faith and due regard to the Treaty. If one applies the principle of good faith and due regard to the *USA-193* intercept, concluding that the U.S. had "reason to believe" is with merit even though the anticipated impact of *USA-193*'s intercept would be significantly less than *FY-1C*'s.

While concluding the U.S. had "reason to believe" has merit, the United States was also correct in stating the position that "we do not believe that we meet the standard of Article IX of that Treaty that says we would have to consult in the case of generating potentially harmful interference,"⁸⁵ because this is a statement *only* of the United States own evaluation whether they have reason to believe their planned activities would cause

⁸⁵ See *DoD News Briefing*, *supra* note 5.

potentially harmful interference. Solely on the basis of the U.S. evaluation, the intercept of *USA-193* was not subject to Article IX international consultation obligations. The U.S. position is defensible because the objective evidence presented prior to the planned intercept of *USA-193* does not conclusively establish whether the planned intercept would give "reason to believe" that interference would be generated that was potentially harmful to other State activities in outer space. Unlike *FY-1C*, the interception orbit of *USA-193* would not result in a long lasting debris field of significant size and any debris generated would primarily be in a low altitude decaying orbit. It was within the discretion of the United States to conclude the planned intercept of *USA-193* did not give "reason to believe" potentially harmful interference would occur because the facts did not definitely establish the U.S. should have had "reason to believe."

While this exercise of this discretion by the United States was within the bounds of Article IX, it was also arguably a strategic mistake. As discussed above, the Outer Space Treaty is primarily a treaty of principles, crafted for the purposes of *proscribing* norms to an area where uncertainty existed as to what law, if any, applied. These proscriptive principles, by their very nature, cannot embody their object and purpose by solely reviewing their text. As a result subsequent State actions play a role in the interpretation and application of the Treaty. The U.S. is able to defend its conclusion that Article IX consultation were not triggered in part because State practice has yet to clearly establish the scope of the consultation obligation.

Why was denial a mistake? Even though the U.S. denied Article IX applied to the *USA-193* intercept, the U.S. still undertook international consultations and informed the international community of their planned activity. The U.S. essentially fulfilled the minimum requirements of appropriate international consultations: to contact States Parties to the Treaty whose peaceful explorations and use of outer space would experience potentially harmful interference and provide them with information sufficient to take appropriate action to prevent potentially harmful interference with their uses or explorations in outer space, the Moon and other celestial bodies.

The U.S. could have proffered that Article IX international consultation obligations were applicable. If so, the procedure and substantive nature of the consultations the United States undertook would have established a precedent of State practice with regards to Article IX. This was a unique opportunity to guide the application of Article IX. Instead, the U.S. essentially fulfilled the Article IX requirements without establishing a precedent to clarify Article IX obligations. As a result, other States planning kinetic ASAT activities and experiments will not have an historical legal precedent of a State Party recognizing and adhering to Article IX international consultation obligations. If the U.S. had recognized Article IX's application, States that plan to conduct kinetic ASAT experiments would be under greater scrutiny if they failed to recognize Article IX's application and conduct appropriate international consultations. U.S. recognition would also have set a threshold of debris generation that clarifies when a State should "have reason to believe" their planned activity or experiment in space would cause potentially harmful interference.

ii. Obligation to Avoid Harmful Contamination of Outer Space

As discussed above, conducting a kinetic ASAT intercept on an orbiting satellite does not in and of itself constitute unavoidable harmful contamination of outer space. It is possible that the underlying target or technology of an ASAT test will generate unavoidable space debris. However, kinetic ASAT tests can be conducted against targets in orbits with altitudes and inclinations that would minimize harmful contamination.

The Treaty is silent on appropriate measures or authoritative evaluations to determine whether a State has taken appropriate measures to avoid harmful contamination; however, the United States recognized *USA-193* would create harmful contamination and took measures to avoid it by intercepting the satellite in a decaying orbit at a low altitude, minimizing the lifetime of space debris generated and other potentially harmful contaminants in the outer space environment. These actions were in accordance with the principle of due regard enumerated in Article IX and the U.S. fulfilled the obligation to avoid harm-

ful contamination by taking these actions. As an example of subsequent State action, the harmful contamination and debris mitigation measures undertaken by the U.S. will contribute to interpreting the obligation of harmful contamination avoidance, as least with regards to kinetic ASAT satellite intercepts.

VI. CONCLUSIONS

China's *FY-1C* ASAT experiment violated the appropriate international consultation provisions of Article IX of the Outer Space Treaty. The orbit of *FY-1C* was of such a nature that it was reasonable to conclude prior to conducting the ASAT experiment that a successful intercept would create a debris field of size and duration that would cause potentially harmful interference with the peaceful uses and explorations of other States Party to the Treaty.

In the defense of China, their lack of consultation *prior* to the ASAT experiment is consistent with the Cold War practices of the United States and the Soviet Union (assuming the Cold War kinetic ASAT experiment of the United States and Soviet Union triggered the international consultation obligation). Nonetheless, State practice has yet to definitively establish that kinetic ASAT activities and experiments are granted an exception to Article IX obligation to conduct appropriate international consultations.

The *USA-193* intercept arguably did not violate and may not have been subject to Article IX's international consultation obligation. If the planned *USA-193* intercept did trigger the obligation to conduct appropriate international consultations, the United States met the *ad minimum* requirements of this obligation.

The United States denied that Article IX's international consultation obligation was applicable to the planned *USA-193* intercept. By denying its application and not recognizing its application and establishing precedent of State practice, the United States lost a strategic opportunity to shape the interpretation and development of Article IX.

The violation of Article IX's international consultation provision by China continues a disturbing trend of States not recognizing the application of this provision to kinetic ASAT activi-

ties. If this trend continues, the argument in favor of subsequent State practice establishing an agreement among States Party to exclude kinetic ASAT activities from Article IX's international consultation provision is strengthened. Fortunately several States protested China's failure to consult in the days following *FY-1C*'s destruction, reversing the trend of States' tacit approval implicit by silence.

One reason Article IX has failed to ensure States fulfill their obligations is because the Outer Space Treaty does not provide a procedure for appropriate international consultations nor designate an agency to which States should turn for an authoritative evaluation of their planned activities.⁸⁶ As a result Article IX's procedural and substantive application is largely left to the discretion of States, and States determine themselves whether the obligation to consult is triggered. In our anarchic system of international relations, States have little motivation to interpret and apply agreements to restrict their freedom of actions without assurance that other States will act in kind. This failure is a manifestation of the much greater problem: the vacuum of supranational authority in international law. Today no supranational authority exists that can rule on the legality of State action and enforce this judgment independent of State influence. As a result, the immediate self-interests of States support restrictive interpretation and application of Article IX.

Even with self-interest supporting restrictive interpretations, as discussed *supra*, an interpretation of the Outer Space Treaty based on the Vienna Convention methodology does provide some degree of objectivity for States who are assessing their planned activities. For example, States are obliged to consider their planned activities in light of the principle of due regard and interpret provisions of Article IX in good faith.

In instances of ambiguity, the Outer Space Treaty does not provide a mechanism of interpretation or dispute resolution. Fortunately, in the event of dispute arising due to interpretation and application of the Treaty States can rely on and should make use of the U.N. Charter's mechanism of pacific settle-

⁸⁶ Vlastic, *supra* note 50.

ments of disputes.⁸⁷ When a State clearly violates Article IX, the international community should react with unified condemnation, take appropriate actions to discipline the violator (in accordance with the U.N. Charter), and ensure violations are not repeated in the future. It is critical for States to appreciate that at this point in history, State practice and application of Article IX will largely determine whether or not Article IX is rendered ineffectual. It is in the interests of all nations for Article IX to be a substantive provision and not just empty words. As the *FY-1C* experiment demonstrated, the failure of States to consult prior to conducting activities increases mistrust, raises tensions, and undermines international peace and security.

The international community should take concrete steps towards strengthening Article IX. An additional protocol to the Outer Space Treaty could be negotiated that provides a procedure and authoritative body for determining whether a planned activity warrants international consultation and whether appropriate measures have been planned to avoid harmful contamination of outer space and adverse changes to the Earth's environment. Another option is for the international community to agree to standards of harmful contamination and harmful interference mitigation independent of an additional protocol.

Concluding that Article IX imposes a substantive obligation and further concluding that the *FY-1C* intercept violated this obligation is a serious charge. While we all bring to a discussion the bias of our individual human experience, this author recognizes such bias exists and has attempted to assess the *FY-1C* and *USA-193* intercepts objectively. There is no doubt that all people, regardless of nationality, share the common human desires of self-preservation and peace. It is therefore with hope that these conclusions are made. The hope that States, when given greater clarity as to the scope of Article IX's legal obligations, will more fully respect and carry out their respective agreements.

⁸⁷ See U.N. Charter arts. 33-38.

INTERNATIONAL SPACE EXPLORATION AND CRITICAL TRANSPARENCY OF *BASIC* RESEARCH: IMPACT OF THE U.S. INTERNATIONAL TRAFFIC IN ARMS REGULATIONS

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I. INTRODUCTION

In January 2004, President George W. Bush announced a Vision for Space Exploration (VSE) that, in part, encouraged and mandated for the United States the pursuit of “opportunities for international participation to support U.S. space exploration goals.”¹ In recent years, however, U.S. scientists have expressed a significant and growing frustration with their inability to collaborate and exchange information and research data effectively with foreign colleagues in pursuing that mandate for space exploration. The source of much of this frustration has been the confusion caused by inconsistencies in the interpretation and application of pivotal terms, such as “basic research,” “fundamental research,” “applied research,” and “public domain” as these terms appear primarily in the U.S. Interna-

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¹ See Press Release, The Whitehouse, President Bush Announces New Vision for Space Exploration Program (January 14, 2008), <http://www.whitehouse.gov/news/releases/2004/01/20040114-3.html>.

tional Traffic in Arms Regulations (hereinafter the ITAR) and enabling documents.² These regulations were intended and drafted principally to protect the economic, military, and diplomatic interests of the United States. History has shown in large part that, in many instances, these regulations and their applications are self-defeating with respect to those goals.

While individuals involved with research in the space sciences recognize the necessity of treating certain hardware and technology as militarily sensitive, they also believe that the ITAR are much too inclusive; and unnecessarily so. Further, the United States has many policy priorities in space other than national security, including its diminishing leadership role in space exploration, global commercial competitiveness, re-establishing university excellence in the space-related sciences and technologies, and encouraging and maintaining critically necessary international partnerships in conducting "fundamental research" in space and space-related matters. There are ongoing costs and delays of significance in the processing of ITAR requirements, particularly as they relate to basic research proposals relying in part on foreign colleagues, foreign nations, and foreign funding for their undertaking. Critical international collaboration for basic and applied research involving U.S. personnel and facilities is diminishing rapidly.

Much of the confusion seems to stem from the inability or political unwillingness of the U.S. Congress and the U.S. Department of State to formulate realistic policies dealing with international relations consistent with national, regional, and global defense and security realities, and the role of space research and exploration in formulating those policies. This, combined with what seem to be intentional regulatory drafting ambiguities, has created an environment of debilitating confusion for scientists and engineers involved in U.S. civilian and shared

² Arms Export Control Act, 22 USC § 2778 (1979), Priv. L. No. 96-72m, 93 Stat. 503 (1979), 22 C.F.R. §§ 120-130 (2002). The ITAR currently are administered by the Directorate of Defense Trade Control (DDTC) at the U.S. Department of State.

civilian/military space activities mandated by the VSE, consistent with the 2006 U.S. National Space Policy.³

In addition to inconsistencies in interpretations and applications of pivotal ITAR words and phrases, the confusion and frustration of scientists and university and non-profit research laboratory export control officers also find their roots in the increasing indifference and lack of true understanding of legislators and policymakers regarding the *absolute critical importance of maintaining and enhancing ongoing "basic research,"* add to that, also, their increasing deference to directed or "applied" research with comparatively short-term public benefits. In large part, the critical need for basic research is lost in the broadly cast net of the ITAR, i.e., the resultant decreasing transparency of *basic* scientific research as it relates to (1) traditional and crucial open collaboration among colleagues and the necessary written and oral exchanges of data/information deriving from their basic research efforts, and (2) the preservation of the serendipitous and uniquely beneficial potentials resulting from such research.

There is a pressing need to establish more refined and consistent definitions of pivotal words and phrases, such as "*basic* research," "*fundamental* research," "*applied* research," and "public domain" as used in applicable laws in order to establish continuity and consistency, both in domestic and international understandings and uses of those words and phrases in the ITAR. The observation is based in large part, although certainly not solely, on the fact that scientists and their colleagues may be held *personally* accountable for violations of the ITAR civil and criminal provisions, and their respective sanctions or penalties.

³ For a general commentary by the author on the 2006 U.S. National Space Policy, as well as the full text of the unclassified version of the policy, see G.S. Robinson, *The U.S. National Space Policy: Pushing the Limits of Space Treaties?*, ZEITSCHRIFT FÜR LUFT- UND WELTRAUMRECHT [GERMAN J. OF AIR & SPACE L.], 45-57 (ZLW 56.Jg. 1/2007).

II. BACKGROUND

Since at least the late 1930s, the United States has restricted in one fashion or other the export of certain goods and technology. The objective, of course, is protection of its national security and foreign policy interests by maintaining control over the export of certain goods, technologies, and services that might be used in military development of other nations; particularly those that may have hostile intentions toward the United States and its allies. At present, three governmental Departments are involved in promulgating a variety of regulations aimed at securing the nation's various interests, including those relating to national security and economic competitiveness. The Department of Commerce regulates "dual use" items through its Export Administration Regulations (EAR), the Department of State through its International Traffic in Arms Regulations (ITAR),⁴ and the Department of Treasury through its designation of trade embargoes by its Office of Foreign Assets Control.⁵

The ITAR assist in controlling trade in defense items and services as stated by the Arms Export Control Act, and Executive Order 11958, as amended. All categories on the U.S. Munitions List (USML) set forth the defense items and articles to be regulated by the ITAR.⁶ These regulations also control all space satellites that were placed on the USML by the Strom Thurmond National Defense Authorization Act of FY 1999,⁷ and Category XV of the USML includes "Spacecraft Systems and

⁴ EAR regulations are found at 15 C.F.R., Chap. VII, Part 734. The ITAR control defense trade as referenced in 22 U.S.C. § 2788 of the Arms Export Control Act [see 22 U.S.C. § 2778 (1979), Priv. L. No. 96-72, 93 Stat. 503 (1979), 22 C.F.R §§ 120-130 (2002)].

⁵ 31 C.F.R. Part 500. The Office of Foreign Assets Control (OFAC) "administers and enforces economic and trade sanctions based on U.S. foreign policy and national security goals against targeted foreign countries and regimes, terrorists, international narcotics traffickers, those engaged in activities related to the proliferation of weapons of mass destruction." Office of Foreign Assets Control, *Mission*, <http://www.ustreas.gov/offices/enforcement/ofac/> (last viewed Nov. 3, 2008). In the context of activities requiring collaborative efforts with member states of the European Union (EU), that organization has condemned, along with other entities, certain OFAC and related security laws aimed at various embargoed nations.

⁶ The United States Munitions List, 22 C.F.R. § 121.1 – 121.16 (2008).

⁷ Strom Thurmond National Defense Authorization Act of FY 1999, Pub. L. No. 105-261, 112 Stat. 1920 (1998).

Associated Equipment,” which specifically references scientific satellites among other types as defense articles, including certain types of ground control stations for satellite telemetry and other components of spacecraft systems.⁸ The objective of the ITAR, EAR, and other related regulations and policies is to control the flow of defense-related information, products, and technologies, including oral and visual disclosure or transference of technical data to foreign individuals, regardless of whether it is accomplished within the United States or abroad. Except for limited circumstances and exceptions set forth in the ITAR, the transfer of defense articles and services to foreign individuals and entities all require prior review and authorization by the U.S. Department of State. Clearly, use of these regulations in furtherance of U.S. legislation and executive branch policies is for assisting U.S. foreign policy objectives, and also protecting the U.S. economy in the context of competitive international trade. Perhaps most important of all, the regulations are designed to assist in preventing the burgeoning international proliferation of weapons of mass destruction.

Nevertheless, regulations controlling various goods, technologies, and collaborative information exchanges also have negative influences on the quality of critically necessary *basic* research conducted by United States universities and non-profit research laboratories in and outside the United States. These controls, on occasion, manifest themselves in self-defeating and destructive restrictions on the traditional international understanding of what constitutes unrestricted academic freedom to conduct basic research, that is, the open and unrestricted publication and dissemination of research findings and the necessary

⁸ Defense Services referenced in the USML are defined to include “the furnishing of assistance (including training) to foreign persons, whether in the United States or abroad in the design, development, engineering, manufacture, production, assembly, testing, repair, maintenance, modification, operation, demilitarization, destruction, processing or use of defense articles.” International Traffic in Arms Regulations, 22 C.F.R. § 120.9(a)(1). It would appear from such an inclusive listing that no U.S. research, basic or applied, would escape the ITAR, even with its exemption of “fundamental research”, which includes “basic” as well as “applied research”...and certain transitional items and services embedded in basic research and certain aspects of the research protocol and equipment as it evolves.

open collaboration among scientist and engineer colleagues involved in that kind of research.

After serious expressions of concern and indignation by scientists in university communities involved with space research, the US Department of State amended the ITAR in 2002 in order to exclude institutions of higher learning from having to obtain licenses in order to interact with colleagues in certain other nations, as well as with specifically designated non-US citizens working in the United States who were involved in conducting “fundamental research.” And here is where the current issues involved with protecting basic research come into play. The definition of fundamental research, as it appears in the ITAR, is defined as “basic *and* applied research in science and engineering where the resulting information is ordinarily published and shared broadly within the scientific community”, and the research must be conducted by “accredited institutions of higher learning”.⁹

Unfortunately, the relief intended by the ITAR amendment in 2002 only added to the confusion being experienced by scientists and engineers involved in basic research. Significant uncertainty exists regarding the definition, itself, of “fundamental” research that is to be exempted...again, under certain additional confusing conditions. For example, as noted in a report of the National Research Council, of the National Academies, entitled “Space Science and International Traffic in Arms Regulations: Summary of a Workshop” held in September 2007,

There is confusion about whether results need to have been published or can simply be intended to be published, Many space science activities conducted through academic institutions involve collaboration with private companies and other parties that are not ‘accredited institutions of higher learning’ and thus do not appear to be covered under the fundamental-research exclusion in ITAR. That the regulations apply differently to universities, national laboratories, government, and industry has led to confusion as to what institutions must do to comply with ITAR. There is also uncertainty about what types

⁹ International Traffic in Arms Regulations, 22 C.F.R. § 120.11 (8) (emphasis added).

of project-related information can be provided to non-U.S. project participants without a license and what types can be transmitted to foreign students in an academic setting.¹⁰

The NRC Report continues by observing that

The process for obtaining licenses and technical-assistance agreements (TAAs) and the administrative work necessary to ensure ITAR compliance in project implementation can introduce substantial additional costs and time requirements for space projects. It is especially notable, moreover, that some violations of ITAR are punishable criminal offenses. Because of the many uncertainties...about the applicability of ITAR, institutions tend to interpret the regulations conservatively to be on the safe side of potential legal difficulties and thus often impose upon themselves burdens that might not be necessary.¹¹

Of significance here, and discussed at some length, *infra*, is the personal financial and legal burdens placed upon scientists proposing basic research (as a component of “fundamental” research under the ITAR definition), as well as upon the employing institution’s contract compliance officer or export control officer; particularly if they make an uninformed and wrong decision.

A. Just What is “Basic Research” and Why is it so Important?

Although Dr. S. Dillon Ripley, former Secretary of the Smithsonian Institution in Washington, D.C., frequently referred to basic research as the “pursuit of the unfashionable by the unconventional,” it is essential to recognize and accept that the pursuit of basic research in its most pure and reasonably

¹⁰ See MARGARET G. FINARELLI, *SPACE SCIENCE AND THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS: SUMMARY OF A WORKSHOP*, viii (The National Academies Press, Wash., D.C., 2008) [hereinafter *SPACE SCIENCE AND THE INTERNATIONAL TRAFFIC*].

¹¹ *Id.* The stated goals of the workshop were to identify concrete problems that academic, government, and industry space science researchers, faculty, managers, and institutions face as a result of ITAR regulations; determine the extent to which those problems are the result of implementation of the regulations or of misunderstanding of what is required by various parties; and identify possible steps for addressing or further examining the problems.

unencumbered form is absolutely critical to the survival of any civilization. It is what applied research and technology are built upon. No less can be said about its criticality in pursuing “space exploration” in the context of universal “human curiosity,” as referenced in the 2004 Presidential Vision for Space Exploration. “Basic research” is conducted in what has been eloquently referred to by Smithsonian Institution Senior Scholar Emeritus, Dr. Wilton S. Dillon, as an “intellectual free trade zone.”¹² It also has been characterized more definitively, but still with a fair amount of ambiguity, as

experimental or theoretical work, undertaken *primarily* to acquire new knowledge and to develop related concepts and principles, without anticipating any particular use; the term ‘applied’ refers to similar original research that will result in new knowledge, but directed primarily toward a specific practical objective.¹³

Use of the word “primarily” to define basic research creates understandable confusion, as does the phrase “and to develop

¹² See Letter of Nomination from Dr. Dillon to the Smithsonian Board of Regents on behalf of Walter Isaacson as a candidate for Secretary of the Smithsonian Institution (July 14, 2007) (on file with author).

¹³ ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, FRASCATI MANUAL 2002: PROPOSED STANDARD PRACTICE FOR SURVEYS ON RESEARCH AND EXPERIMENTAL DEVELOPMENT, 30 (2002) [hereinafter FRASCATI MANUAL]. See also the Lawrence Berkeley National Laboratory (LBNL) statement explaining the difference between basic and applied research in the following manner:

Basic (aka fundamental or pure) research is driven by scientist’s curiosity or interest in a scientific question. The main motivation is to expand man’s knowledge, not to create or invent something...[B]asic research lays down the *foundation* for the applied science that follows. If basic work is done first, then applied spin-offs eventually result from this research...Applied research is designed to solve *practical problems* of the modern world, rather than to acquire knowledge for knowledge’s sake. According to Dr. Ashok Gadgil of LBNL, one way to look at it is to ask the following question: ‘How long will it be before some practical application results from the research?’ If a practical use is only a few years away, then the work can be defined as strictly applied research. If a practical use is still 20-50 years away, then the work is somewhat applied and somewhat basic in nature. If a practical use cannot be envisioned in the foreseeable future, then the work can be described as purely basic research.

Lawrence Berkeley National Laboratory, *What is Basic Research?*, <http://www.lbl.gov/education/ELSI/research-main.html> (last visited Nov. 3, 2008) (emphasis added).

related concepts and principles” It might be helpful if the latter phrase referred to “related pure science concepts and principles,” thereby removing the activity unquestionably from “. . . without anticipating any particular use,” which relates to applied science. Again, the problem for scientists and the ITAR variety of export control officials and governmental enforcement personnel in assessing proposed basic research, that is, “curiosity” in that word’s most basic and pristine definition, and determining whether it is ITAR-exempted, is the phrase “fundamental” research, which, in the context of relying on ITAR and enabling legislation, has a chimera-like complexion and function. It can be basic research *or* applied research, depending upon how close the potential is for resulting data to be used or applied to a functional objective; and as that objective *might* potentially have implications in the context of national defense services and defense items.

While the definitions, above, of fundamental research incorporate the definitions, or significant components of those definitions, both of basic and applied research, there is a discrete difference between the two and they are not synonymous. In fact, the ITAR offers no definition of basic research as a completely independent process, except by vague implication. Part of the problem frequently encountered is that in order to conduct given basic research, instrumentation might be required at the outset, or somewhere during the unfolding research process, that is not exempted under the ITAR.

Keeping in mind that the VSE also refers to its objectives in space as being required to improve conditions on Earth, in order to understand let alone agree with these distinguishing characteristics would require an almost word-by-word analysis, since these definitions are replete with vagueness and inaccuracies in contexts and in terms of timing. Perhaps the most pivotal component in the above research oriented distinctions between basic and applied research is that somehow it is more often than not influenced by one’s personal experience, perspective, and direct involvement in a specific research project. That, in itself, might be viewed as a classic functional ambiguity in the arena of formulating and stating the essential nature of a set of facts, i.e., the definition of “definition.” Suffice to say that promulgation of

a functional definition of *basic research while in progress* would be helpful as well.

These definitions also require further definitions which, in turn, require further definitions, almost *ad infinitum*, thereby leaving the basic research scientist in a constant quandary as to whether he or she will be starting and ending with strictly basic research characteristics; and when the research might transition into fundamental research leading directly to applied research. The distinction between basic and fundamental research, and then between fundamental and applied research is more often than not unclear both to the scientist and the reviewing export control official responsible for interpreting the fact situation and applying the ITAR criteria. It certainly leaves the basic research scientist wondering at what point in the pursuit of his or her research the methodology employed will be aborted and collaborative efforts seriously compromised, if not effectively terminated altogether. Even a law degree and years of experience will not necessarily make any knowledgeable scientist involved in basic research feel comfortable, given the civil and criminal penalties applicable for personal as well as institutional violations of ITAR.¹⁴

A perilously increasing inability exists on the part of governments, industry, and science policy administrators, to embrace in a functional fashion the critical distinctions between basic or pure research, and the applied sciences. In policy, basic research has been devolving in large part into defining and pursuing pure "curiosity" in a *directed* context. Basic research seems to be fading almost irretrievably amidst the perceived need of almost every government and a good portion of industry and academia to support directed research for economic benefit, military advantage, or political and diplomatic gains.¹⁵ The imposition of intellectual property rights upon the results of basic

¹⁴ For the criminal sanctions and consequent penalties, see International Traffic in Arms Regulations, 22 C.F.R. § 120.27.

¹⁵ For a discussion of the distinction between basic and applied research, and the diminishing support of basic research globally, see George McLure, *Are We Underfunding Basic Research in the Physical Sciences?*, IEEE – USA, TODAY'S ENGINEER ONLINE (June 2005), <http://www.todaysengineer.org/2005/Jun/research.asp>.

research when that research is funded in whole or in part by the private commercial sector is adding to this process.¹⁶

B. “Basic Research” and the Role of Serendipity

A great many, if not most, of the scientific discoveries leading to civilization-changing applications have been completely unanticipated. They have resulted from serendipity and not by direction or design. “Serendipity” is commonly defined as “the faculty of finding valuable or agreeable things not sought for.”¹⁷ Louis Pasteur noted that “[i]n the field of observation, chance only favors the prepared mind.” Chance has been an important factor in basic research and resulting fundamental discoveries and applied sciences.¹⁸ Teflon, cellophane, polyethylene, rayon, the microwave oven, penicillin, aspirin, quinine, retin-A and even Viagra represent a very small number of serendipitous discoveries deriving from the work of scientists looking for something entirely different, that is, pure empirical data based on the results of basic research conducted with the sole objective of obtaining that data for no other reason than just to have it and know it.¹⁹ It is essential to recognize and accept that the

¹⁶ In the United States, pursuant to the Public Patent Policy, the United States usually only retains royalty-free march-in rights over an invention it has funded to any extent, whether private sector or public, *see* Pub. L. No. 96-517, and the implementing policies and regulations set forth in OMB Circular A-124.

¹⁷ WEBSTER'S NINTH NEW COLLEGIATE DICTIONARY, 1074 (1991).

¹⁸ In many respects, the very nature of uncertainty of outcome of basic research requires a funding objectivity that focuses on the likelihood of success in exposing new data or knowledge of it, and the credentials of the scientist(s) and collaborator(s) involved. If the assessments are positive, the funding is made available and there should be, as a rule of thumb, a success expectation of no more than 50%.

¹⁹ As noted by David Harris, Editor-in-Chief of *Symmetry: Dimensions of Particle Physics*,

Basic research vs. political priorities: It's a timeless struggle. The conflict often comes down to competing timescales: Basic research tends to produce benefits in the long term, while politicians in a representative democracy are required to show their constituents what they are accomplishing in their current terms in office. One way scientists try to defuse this tension is to talk about scientific spin-offs—of the serendipitous application of basic research to the creation of new technology or products. The real value in scientific spin-offs, apart from the new technologies or creations themselves, is that they reflect an integration of science into wider society. Science need not be relegated to a corner of human existence where atypical people work in atypical jobs. Science is a

pursuit of basic research in its most pure and reasonably unencumbered form is critical to pursuing space exploration in the context of universal “human curiosity,” as referenced in the 2004 presidential Vision for Space Exploration. “Basic research” also has been characterized more definitively, but still with a fair amount of ambiguity, as

experimental or theoretical work, undertaken *primarily* to acquire new knowledge and to develop related concepts and principles, *without anticipating any particular use*; the term ‘applied’ refers to similar original research that will result in new knowledge, but directed *primarily* toward a specific practical objective.²⁰

Use of the word “primarily” to define basic research creates understandable confusion, as does the phrase “and to develop related concepts and principles” It might be helpful if the latter phrase referred to “related pure science concepts and principles,” thereby removing the activity unquestionably from “without anticipating any particular use,” which relates to applied science. Again, the problem for scientists and the ITAR variety of export control officials and governmental enforcement personnel in assessing proposed basic research, that is, “curiosity” in that word’s most basic definition, and determining whether it is ITAR-exempted, is the phrase “*fundamental* research,” which, in the context of relying on ITAR and enabling legislation, has a chimera-like complexion and function. It can be basic research *or* applied research, depending upon how close

natural part of a healthy society. A general consensus flowing from certain scientists at the Smithsonian Institution and various universities who and which were interviewed by the author over a lengthy period of time, indicated strongly that the general public and, unfortunately, a good portion of private industry and governmental agencies offering research grants and contracts, considered the kinds of subjects involving basic research to be for the most part useless and often unjustifiably expensive musings. In short, basic research lacked the functional consequences of directed research, evolved fundamental research, and strictly applied research from the outset of conception. Basic research proposals were considered less apt to compete successfully for funding with those proposals embracing applied or directed research.

David Harris, *From the Editor: The Role of Spin-offs*, 4 SYMMETRY: DIMENSIONS OF PARTICLE PHYSICS (June/July 2007).

²⁰ FRASCATI MANUAL, *supra* note 13, at 30 (emphasis added).

the potential is for resulting data to be used or applied to a functional objective; and as that objective *might* potentially have implications in the context of national defense services and defense items.

While the definitions, above, of fundamental research incorporate the definitions, or significant components of those definitions, both of basic and applied research, there is a discrete difference between the two and they are not synonymous. In fact, the ITAR offers no definition of basic research as a completely independent process, except by vague implication.

Keeping in mind that the VSE also refers to its objectives in space as being required to improve conditions on Earth, in order to understand let alone agree with these distinguishing characteristics would require an almost word-by-word analysis. Perhaps the most pivotal component in the above research oriented distinctions defining *basic* and *applied* research is that somehow it is more often than not influenced by one's personal experience, perspective, direct involvement in a specific research project. Promulgation of a functional definition of *basic research while in progress* would be helpful, as well, since that undertaking often is distinguishable (if at all possible) only by personal experience of the investigating scientist and his/her associates.

III. IN SEARCH OF WORKING DEFINITIONS: BASIC RESEARCH EXEMPTIONS UNDER THE ITAR

The ensuing discussions are premised in significant part on operative definitions of words and phrases in the context of applicable ITAR and related laws, interpreted and applied by a multitude of disparate individuals involved in space-related basic research, and representing a variety of cultural backgrounds and levels of training. The result has been an increasing awareness of, and concern with, potential criminal and civil penalties and consequences applicable to those individuals and their employing organizations responsible for assuring compliance with the ITAR.

A. Arms Export Control Act and ITAR Definitions

As noted, above, the *Arms Export Control Act, as amended* (AECA), specifically authorizes the President of the United States to control the export and import of “defense articles and defense services”, such as arms, ammunition and implements of war, to protect U.S. national security and foreign policy.²¹ The Office of Defense Trade Controls (ODTC) in the Department of State administers the Act in part through implementing regulations, that is, the ITAR. These regulations contain a list of equipment considered to be arms, ammunition or implements of war, and referred to as the United States “Munitions List” (USML).²² Military satellites and launch vehicles have been on the Munitions List for many years. In addition, “technical data” related to satellites and launch vehicles also are on the Munitions List.²³

According to §120.10 of the ITAR definitions,²⁴ technical data is any information

[W]hich is required for the design, development, production, manufacture, assembly, operation, repair, testing, maintenance or modification of defense articles. This includes information in the form of blueprints, drawings, photographs, plans, instructions and documentation This definition does not include information concerning general scientific, mathematical or engineering principles commonly taught in schools, colleges and universities or information in the public domain as defined in §120.11.

Under §120.11 of the ITAR definitions:²⁵

²¹ Arms Export Control Act, *supra* note 2.

²² United States Munitions List, *supra* note 6. The USML is divided into 22 categories, and although some categories are very specific, the majority vary in coverage and, for the most part, lack the specificity that normally assists in easy and timely compliance.

²³ See generally, F. Kenneth Schwetje and Dennis J. Burnett, *U.S. Export Controls and Litigation of Contracts: Another Example of Unintended Consequences*, in 45 PROCEEDINGS OF THE COLLOQUIUM ON THE LAW OF OUTER SPACE 356, 357 (2002).

²⁴ 22 U.S.C., § 120.10.

²⁵ *Id.* at § 120.11(8).

[p]ublic domain means information which is published and which is generally accessible or available to the public: . . . (8) Through fundamental research in science and engineering at accredited institutions of higher learning in the U.S. where the resulting information is ordinarily published and shared broadly in the scientific community. Fundamental research is defined to mean basic and applied research in science and engineering where the resulting information is ordinarily published and shared broadly within the scientific community, as distinguished from research the results of which are restricted for proprietary reasons or specific U.S. Government access and dissemination controls. University research will not be considered fundamental research if: (i) The university or its researchers accept other restrictions on publication of scientific and technical information resulting from the project or activity,²⁶ or (ii) The research is funded by the U.S. Government and specific access and dissemination controls protecting information resulting from the research are applicable.

The precision and uniformity of the accepted meaning of “fundamental research” can be the key to ITAR compliance and implementation in the area of scientific research.

B. General Distinction of the ITAR and EAR

Generally, the objectives of the ITAR and EAR include the restriction on export and re-export of technology, services, and goods or equipment that might contribute to military postures of U.S. adversaries, as well as unacceptable economic superiority. They also are designed to assist in confronting and protecting against acts of terrorism and the development of weapons of mass destruction. Other than the implementation of the EAR by the Department of Commerce and the ITAR by the Department of State, there are major differences between the ITAR

²⁶ These restrictions, in addition to those imposed on collaborating universities and other such organizations, may often relate to the identification of intellectual property rights inuring to the principal investigator and the entity(ies) sponsoring the research, and may have nothing whatsoever to do with protected data/information relating to national security interests. Very few grants are being made by the private sector or governmental sources for basic research without the retention of some form of intellectual property rights by the granting entity.

and the EAR. For example, the ITAR²⁷ primarily address control of military “items” or articles considered part of, or important to, the national defense, and also technical data connected with defense articles or *items* and defense *services*.

Specifically included in the ITAR jurisdiction and control are the export and re-export of technology and data related to space activities, primarily because of the potential for application of those matters and technology to missile technology. The EAR²⁸ address what are considered to be “dual use” items, as well as various items that could have military applications, such as pathogenic biological materials, aircraft designed primarily for civilian use, computers and program data, as well as any related technology.

Export control compliance requires scientists engaged in research projects to differentiate between several different types of research, the definitions of which are vague and confusing at best and of little practical meaning at worst. What is clear is that information in the “public domain” is potentially exempt from export licensing requirements. In order for research to be considered within the public domain for export purposes it must be considered *fundamental research*; and what is less than clear in practice are the distinguishing features of such research under the applicable export regulations.

Again, as noted previously, the ITAR define fundamental research as “*basic and applied research* in science and engineering where the resulting information is ordinarily published and shared broadly within the scientific community, as distinguished from research the results of which are restricted for proprietary reasons or specific U.S. Government access and dissemination controls.”²⁹ The Export Administration Regulations (EAR) share a fairly similar definition of fundamental research with the ITAR, defining such research as

²⁷ 22 C.F.R. §§ 120-130.

²⁸ 15 C.F.R. §§ 730-774 (2003).

²⁹ 22 C.F.R. § 120.11(8). “University research will not be considered fundamental research if: (i) The University or its researchers accept other restrictions on publication of scientific and technical information resulting from the project or activity, or (ii) The research is funded by the U.S. Government and specific access and dissemination controls protecting information resulting from the research are applicable.” *Id.*

[B]asic and applied research in science and engineering, where the resulting information is ordinarily published and shared broadly within the scientific community. Such research can be distinguished from proprietary research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary reasons or specific national security reasons.³⁰

Both the ITAR and EAR definitions of “fundamental research” leave much to be desired by way of clarity and general applicability. By incorporating “basic research” and “applied research” into its definition, the term “fundamental research” would seem to surrender any independent meaning. Unfortunately, neither the ITAR nor the EAR provide much helpful guidance on how to distinguish between these different kinds of research. This inherent vagueness has left scientists with a less than clear understanding of the status of research projects with respect to whether a fundamental research exemption from the ITAR applies. Without providing much by way of explanation, the EAR do state that most research conducted at universities will satisfy the definition of fundamental research.³¹ However relieving this rare instance of guidance might appear at first blush, researchers and scientists are still left without any bright lines to discern where the public domain exemption criteria end, and export control coverage begins.

C. Commodity Jurisdiction Review: Varying Definitions and Interpretations

While the regulations provide an avenue by which clarification may be sought,³² the Commodity Jurisdiction Review (CJR) process introduces yet another layer of non-uniform definitional interpretation to the process. Once a request for review is submitted to the Directorate of Defense Trade Controls, the Department of State then out-sources the request for consultation from the Department of Commerce and the Department of De-

³⁰ 15 C.F.R. § 734.8(a).

³¹ *Id.* at § 734.8(b)(1).

³² 22 C.F.R. § 120.4.

fense. In practice, these three departments have different interpretations of what constitutes the components of “fundamental research.”³³ For example, Commerce defines “basic research” as research that “[p]ursue[s] a planned search for new knowledge, *whether or not* the search has reference to a specific application.”³⁴ On the other hand, the Department of Defense defines “basic research” for purposes of fiscal management as

Systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind. It includes a scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. It is farsighted high payoff research that provides the basis for technical progress. Basic research may lead to: (a) subsequent applied research and advanced technology developments in Defense-related technologies, and (b) new and improved military functional capabilities in areas such as com-

³³ COMMITTEE ON DEPARTMENT OF DEFENSE BASIC RESEARCH, NATIONAL RESEARCH COUNCIL, ASSESSMENT OF DEFENSE BASIC RESEARCH (2005), *available at* http://books.nap.edu/catalog.php?record_id=11177.

The Department of Defense (DOD) supports basic research to advance fundamental knowledge in fields important to national defense. Over the past six years, however, several groups have raised concern about whether the nature of DOD-funded basic research is changing. The concerns include these: Funds are being spent for research that does not fall under DOD’s definition of basic research; reporting requirements have become cumbersome and onerous; and *basic research is handled differently by the three services*. To explore these concerns, the Congress directed DOD to request a study from the National Research Council (NRC) so as to determine if the programs in the DOD basic research portfolio are consistent with the DOD definition of basic research and with the characteristics associated with fundamental research. This report presents that assessment. It notes that the current basic research portfolio is largely consistent with the definition, but argues that the definition should change to include use-directed basic research. The report also has other findings and recommendations to improve the efficacy of the DOD-funded basic research.

Id.

³⁴ Bureau of Industry and Security, U.S. Department of Commerce, *Technology Assessment of the U.S. Assistive Technology Industry*, at app. G (Dec. 31, 2001) [emphasis added] [hereinafter *Technology Assessment*], *available at* http://www.bis.doc.gov/defenseindustrialbaseprograms/osies/defmarketresearchrpts/assisttechrept/g_appendix.htm (last visited Nov. 10, 2008).

munications, detection, tracking, surveillance, propulsion, mobility, guidance and control, navigation, energy conversion, materials and structures, and personnel support.³⁵

Clearly, this definition of basic or fundamental research is about as close to directed or applied research as one can come without saying that no difference exists between the two concepts and their implementing methodologies.

D. Basic Research Plus Fundamental Research = Fundamental Research Plus Applied Research

As observed by R. Hardy, the fundamental research exclusion

applies literally to . . . information (but not to export controlled items) resulting from “basic and applied research in science and engineering” . . . conducted at an “accredited institution of higher education” (EAR) or ‘higher learning’ (ITAR) . . . “located in the United States” . . . that is ordinarily published and shared broadly within the scientific community . . . and that is not “restricted for proprietary reasons or specific national security reasons (EAR) . . . or subject to “specific U.S. Government access and dissemination controls” (ITAR).³⁶

Until relatively recently, the vast majority of universities and their research faculty adopted the position that the fundamental research exclusion was just that . . . an “exclusion” from any consideration under the ITAR, and not an “exemption” requiring an explanation of why the research was exempt.

In the ITAR Sec 120.11(8) definition, a clear understanding is that *basic* research cannot be defined without including the criteria of what constitutes *fundamental* research. Fundamental research, on the other hand, must include basic research

³⁵ 2B DOD FINANCIAL MANAGEMENT REGULATION, at ch. 5, “Uniform Budget and Fiscal Accounting Classification (June 2004), available at https://www.defenselink.mil/comptroller/fmr/02b/02barch/02b_05old.pdf. (emphasis added).

³⁶ Robert Hardy, Export Controls and Universities: Licensing Research?, Address Before the National Association of College and University Attorneys – Workshop on Higher Education Research, Compliance and Technology Transfer, 6 (Nov. 10 – 12, 2004), available at <http://206.151.87.67/docs/nacua.doc>.

characteristics, at which point the research may no longer be considered basic. In short, for scientists and other private and governmental officials who are responsible for implementing the ITAR relating to basic and fundamental research, the definition is much too loose and ambiguous to allow for reasonable and consistent interpretations applicable to given facts at any one point in the proposed research. It lends itself to a multitude of equally as confusing decisions regarding exemptions set forth in the ITAR that are applicable to basic research and, under certain circumstances, fundamental research, depending on specific transitioning fact situations at any one point while conducting the research.

The same confusion applies to the definition of fundamental research set forth in the National Policy on the Transfer of Scientific, Technical, and Engineering Information, National Security Decision Directive 189:

Fundamental research means basic *and* applied research in science and engineering, the results of which *ordinarily* are published and shared broadly within the scientific community, as distinguished from *proprietary* research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons.³⁷

Again, use of the word “and” to connect basic research and applied research as though it were always one context, is very confusing in terms of when and under what circumstances exempted basic research exists, applied research exists, or perhaps both exist in an inextricable transitional relationship referred to as fundamental research. Add to that confusion a reference to the term “proprietary research”, which for each situation assessed for potential ITAR exemptions must be examined in terms of applicable facts and applicable law (e.g., intellectual property laws), the likelihood diminishes significantly of rea-

³⁷ National Policy on the Transfer of Scientific, Technical, and Engineering Information, National Security Decision Directive 189 (Sept. 21, 1998) [hereinafter NSDD-189] available at <http://www.fas.org/irp/offdocs/nsdd/nsdd-189.htm> [emphasis added].

sonable, consistent, and proper application of the ITAR, either to basic or fundamental research.

IV. ATTENTION TO THE PRINCIPAL ENABLING LAWS

A. National Security Defense Directive: Recognizing the Difficulties of Academia

On September 21, 1985, the National Security Defense Directive -189 was issued (NSDD-189).³⁸ It was largely in response to intense reaction by universities to the extraordinary difficulties being experienced while attempting to conduct research and still comply with the numerous export control laws reflecting confusion of terms and phrases, as well as interpretations and applications. NSDD-189 defined fundamental research to include “basic and applied” research, and indicated that there would be no restrictions on how federally-funded research is conducted or reported if a university has not had any security restrictions imposed on them. Of particular interest is that research sponsored by industry grants or contracts that impose non-disclosure or other intellectual property safeguards and rights, the fundamental research exemptions will not apply.

In 2001, Condoleezza Rice reaffirmed President Ronald Reagan’s NSDD-189 and the need for open and collaborative research enabling the free exchange of ideas was necessary for “scientific innovation, prosperity, and the U.S. national security.” Perhaps, inadvertently, this statement gave credence to the concern of universities that the majority, if not all, of the research they conducted under federal and private grants and contracts was to be considered significantly more than just *basic* research and, therefore, largely not covered by the free exchange of ideas benefit envisaged in the ITAR exemptions and the Rice letter, itself.³⁹

³⁸ *Id.*

³⁹ See Letter from Condoleezza Rice, former Assistant to President George W. Bush for National Security Affairs, to Dr. Harold Brown, Co-Chairman, Center for Strategic & International Studies (Nov. 1, 2001), available at <http://www.aau.edu/research/Rice11.1.01.html>.

Until comparatively recently, most colleges and universities have not paid close attention over the years to U.S. export and re-export control laws that derive from perceived national security and defense requirements. Generally, these laws have been thought by university staff and faculty to be aimed primarily at major industries in the United States. The laws are extensive and complex. Traditionally, they have been perceived by many university administrators and research faculty members to contain broad exemptions for research conducted at their respective institutions. Nevertheless, the various applicable export control laws do not exclude from their embrace all higher education research and, with governmental attention turning post 9/11 to *all* potential sources of exportable controlled data and information, it is critical for colleges and universities to ensure their grant proposals, research policies, and implementing procedures are consistent with the applicable laws.

Export control regulations *currently* absorb an inordinate amount of the academic research community's time and efforts. Disproportionate funding also is required to address and fulfill these regulatory requirements. Despite the fact that concerted efforts are being made to educate members of that community regarding these regulatory controls, government oversight efforts focused on the academic community regarding these controls are becoming tighter and more demanding. There is every indication that the U.S. government will increase these types of export control regulations and increase, as well, its compliance audits with institutions, faculty, and administrative/management staff within the academic community.⁴⁰

⁴⁰ See, H.R. 4246 of the U.S. Congress, a new bill initially introduced by Reps. Donald Manzullo (R-Ill.) and Brad Sherman (D-Calif) on November 11, 2007, to reduce defense trade license processing times, create a spare part waiver for the closest U.S. allies, and make defense trade licensing more transparent and predictable. Unfortunately, the remedial action of the belabored bill is limited almost exclusively to applied research and product development. As noted by Congressman Manzullo during a March 11, 2008 session on Capitol Hill of the Aerospace States Association, "[t]hese non-controversial good government changes will make munitions manufacturers in every category, including space, more competitive in the international marketplace." Clearly, the objective of the bill does not include promoting and safeguarding basic research in space solely to create knowledge for the sake of knowledge, alone. For a general discussion of H.R. 4246, its intentions, and shortcomings, see *Lawyers Push Bill that would Improve Arms Export Regulations*, Space News, at 17 (Mar. 17, 2008).

V. THE OBJECTIVE

A. Preserve the Benefits of Basic Research through Traditional Open Collaboration between Scientists Involved in Such Research

The focus at this point is on recognition of the ongoing imperative nature and significance of basic research in the context of space exploration. It is essential to identify and preserve for basic research the critically necessary and traditional characteristics of open communication and collaboration, written and oral, between and among scientist colleagues, and to preserve the potentially serendipitous consequences of the results of basic research; particularly those relating to space exploration. To accomplish this, it is essential to identify the primary basic research implementation issues under the ITAR by assessing the research proposal and fact situation in terms of whether an export or re-export license is needed. Help in isolating the principal issue(s) involved in whether research is basic or applied, or somewhere in between in the apparent transitional phase of fundamental research, can be found in knowing exactly when and under what circumstances scientists and their export control officers need apply for an export or re-export license, that is, when a Technical Assistance Agreement (TAA)⁴¹ request needs to be submitted. Licenses are required to provide defense services or enter into technical assistance or manufacturing license agreements.⁴² Under 22 C.F.R. § 120.10(a)(5) technical data does *not* include the information in the public domain, which are therefore excluded from the ITAR licensing requirements.⁴³

⁴¹ If the ITAR exemptions are determined not to be available for specific research proposals, it may be necessary to seek export licenses or Technical Assistance Agreements (TAA) from the Department of State in order to interact with international colleagues in cooperative space science missions.

⁴² See, J. R. Liebman & K. J. Lombardo, *A Guide to Export controls for the Non-Specialist*, 28 Loy. L.A. Int'l & Comp. L.R. 497, 504 (2006). In this context, see also 22 C.F.R. §§ 123.15, 123.16 (2006).

⁴³ “[I]nformation concerning *general scientific*, mathematical or engineering principles commonly taught in schools, colleges and universities” is exempt, as is information in the public domain as defined in § 120.11. Information in the *public domain* includes “fundamental research” and is defined in 22 C.F.R. § 120.11(a)(8).

The EAR offers a definition of fundamental research fairly similar to that of the ITAR. As a matter of statutory construction, these respective provisions in the ITAR and the EAR are sufficiently similar that a definition of basic research in EAR could be read to be tacitly incorporated into the intended meaning of basic research under ITAR.⁴⁴ If this view or position is reasonably acceptable, then the intent behind the rules regarding fundamental research carried out by universities is to identify as “fundamental research” basic and applied research in science and engineering, where the resulting information is ordinarily published and shared broadly within the scientific community.

However, fundamental research under 15 CFR §§ 734.8 and 734.11 provides for specific rules to be used to determine whether research in given institutional contexts qualifies as “fundamental.” The rules are less than simple and precise, and differ with respect to data and related information derived from university research, corporate research, research based at Federal agencies, or research by scientists and engineers based elsewhere. Nevertheless, the data and information deriving from their work will be treated as the product of fundamental research carried out in a corporate context.⁴⁵

B. The U.S. Bureau of Industry and Security (BIS) Technology Assessment Application Questionnaire

In “Technology Assessment: Assistive Technology, General Instructions” in furtherance of a TAA application,⁴⁶ *basic* research is defined as pursuing “a planned search for new knowledge, whether or not the search has reference to a specific application.” Clearly, “new” knowledge is imprecise, and the phrase “*whether or not the search has reference to a specific application*” seems to render the definition in context contradictory at best.

⁴⁴ For the EAR definition, see 15 C.F.R. § 734.8.

⁴⁵ See 15 C.F.R. § 734.8, para. (b) – (d) and § 734.11, which set forth the relatively complex and broad rules for determining whether research carried out at these institutions/entities qualifies as “fundamental research.”

⁴⁶ See *Technology Assessment*, *supra* note 34.

Applied research is then defined in the BIS General Instructions as “[a]pplying existing knowledge to problems involved in the creation of a new product or process, including work required to evaluate possible uses, or apply existing knowledge to problems involved in the improvement of a present product or process.”⁴⁷ Applied research necessitates a relatively easy to understand set of circumstances and criteria. An element of preciseness and continuity in establishing criteria is missing for the transition between basic and applied research that is represented by “fundamental research.” The determination of precisely when and under what circumstances these ambiguous criteria are crossed is difficult at best, and very troubling given the potential penalties for submitting less than accurate information.

Reflecting on the EAR “Country Chart,”⁴⁸ Liebman and Lombardo argue that “[t]he matrix . . . reveals that the level of control applied is determined by four factors: (i) the level of technological sophistication of the commodity, (ii) the commodity’s potential for becoming the foundation of more advanced technology, (iii) the commodity’s end-use, and (iv) the end-user to whom the exporter desires to send the commodity.”⁴⁹ If the authors are correct, it would indicate that at least the first three determinative factors hint at when basic research begins to transition into fundamental and applied research that is apt to require an export/re-export license. Again, the complexity and variations of pivotal definitions, and the lack of continuity in definition/fact situation interpretation and application, all lend themselves to the question of whether the ITAR and the EAR are unconstitutionally vague and over-broad.⁵⁰

The definitional uncertainty as to whether certain scientific research and resulting data and information are covered by the ITAR exemptions is compounded by scientists themselves using the terms “basic research” and “fundamental research” inter-

⁴⁷ *Id.* The BIS is the focal point within the Department of Commerce for developing, promoting, and implementing policies that are intended to ensure a strong, technologically superior U.S. defense industrial base.

⁴⁸ 15 C.F.R., Part. 738, Supp. 1.

⁴⁹ See Liebman, *supra* note 42, at 504.

⁵⁰ See, *infra*, Sec. VIII, Issues of Constitutional Law.

changeably. In short, *basic* research as a concept in practice is potentially critical to all applications in the immediate present or distant future, and that is why it is recognized as such an elusive concept, whether for national defense purposes or strictly civilian commercial uses. That, also, is why the Department of Defense, the National Science Foundation, the Department of Energy, and other Executive departments and agencies funding research pursuits, have always been strong supporters, until lately, of basic research from which fundamental and applied scientific research *may* develop. Consequently, it is not difficult to imagine why very little basic research would be exempted from the ITAR, when governmental and private sector funding are looking for general public benefits, and lucrative benefits if commercially sponsored, to flow within a reasonable period, or even ultimately, from such basic research. These potential “applications expectations” can influence disproportionately the manner in which purported basic research proposals are drafted, and ultimately influence those proposals actually selected for financial support.

VI. COMPROMISING BASIC RESEARCH THROUGH COMMERCIAL INCENTIVES

Sheldon Lee Glashow, Nobel Laureate of physics and Boston University faculty member serving as an unabashed defender of the purity of basic research, a very *expensive* kind of research, noted that

[t]here was a time when companies such as General Electric, AT&T, and IBM played essential roles in the pursuit of truly basic research...Unfortunately, the glory days of commercially sponsored research have virtually come to an end. Employees or former employees of the once great Bell laboratories have garnered an amazing eleven Nobel Prizes, but today's much reduced laboratory is unlikely ever to produce another. The Microsoft Company, to give another example, rather than investing in basic research *per se*, has purchased an enormous portfolio of academic patents, which its scientists and engineers are told to exploit. Once again, basic research has been

relegated to the universities, whose funding for basic research is ever declining.⁵¹

*A. Patents Replacing Publication Incentives for
Basic Researchers*

Expanding on the difficulty of maintaining a level playing field in competition for grants between the basic research scientist and the fundamental and applied researchers is the full likelihood that if a scientist or engineer publishes a peer reviewed idea in an academic journal, the idea will receive comparatively slight interest from the funding institutions or agencies. But if it is an idea that has been patented, or *may be* patentable, it will equally as likely be acquired and developed as a commercial product. This admonition, according to Peter Mikhail,

[U]nderlies the logic of today's governmental technology program. Publication, by itself, is becoming an insufficient reward for scientific achievement. Instead, the patent race has taken its place, and the great halls of America's research universities are now the inventor's track.⁵²

Referring to the emphasis placed in the VSE and the 2006 U.S. National Space Policy on private commercial space endeavors, it can be seen as equally unfortunate that most basic research conducted by scientists in university settings is corrupted by the tantalizing potential of receiving any funding at all for their basic research, and that funding deriving from commercial interests, directly and indirectly, is considered better than no funding at all. Patent officers on the staffs of certain universities and other non-profit basic research entities are inducing scientists to corrupt in varying degrees the substantive objectives and the protocols of their basic research in order to

⁵¹ Sheldon Lee Glashow, *The Scientific and Technological Importance of Basic Scientific Research*, 2 (Jan. 2005), available at <http://peace-foundation.net.7host.com/pdf/sheldon%20%20glashow.pdf>.

⁵² Peter Mikhail, Note, *Hopkins v. Cellpro: An Illustration that Patenting and Exclusive Licensing of Fundamental Science is not Always in the Public Interest*, 13 HARV. J.L. & TECH. 375 (Winter 2000).

secure funding from anywhere to be able to conduct their research at all, or at least some aspect of it. Ever time a grant is made, additional overhead expenses (more often than not “bloated”) are made available to the employing or grantee university.

This reality of commercial influence also tends quite effectively to shut down normal collegial discourse among scientists conducting basic research. The reason may lie in part in the increasing possibility that the information/data discussed might be co-opted by colleagues, who will then unethically and otherwise inappropriately secure intellectual property rights for the information or data they, themselves, may not have produced, or only have been a slight participant in producing. They may have been voracious followers and readers of the publications by the true principal investigator; and, consequently, become the potentially less than ethical beneficiary of the open exchange of data and related information inherent in traditional methodologies of basic research.

Not infrequently, commercial interests will insist upon all scientists involved in a basic research project it is sponsoring, financially or otherwise, signing non-disclosure agreements, further shutting down collegial collaboration and communication about the project, and also requiring the immediate filing of patent applications by a sponsored scientist in order to forestall or shut out the use of the data by the individual or team that may actually produced it!

As questioned, asserted, and properly emphasized by Glashow,

If curiosity-driven research [i.e., basic research] is economically important, why should it be supported by public rather than private funds? The reason is that there are kinds of science which yield benefits that are general, rather than specific to individual products or processes. The eventual economic returns from this kind of research cannot be captured by any single company or entrepreneur. That is why most pure research is funded by governments with no immediate commercial interest in the results. Government support of undirected

basic research must continue if there are to be further technological advances and economic spin-offs.⁵³

In other words, it is imperative that the United States Government and its agents do not interpret the ITAR and its exemptions for basic research in such a way that it defeats the critical *need* for that type of research. As concluded by Glashow in a philosophically ringing observation,

[I]t must be admitted that pursuits of such disciplines as particles physics, astrophysics and cosmology are not motivated by their potential economic relevance, no matter how great that may be. *We study these disciplines because we believe it to be our duty to understand, as best we can, the world we were born to.* Science provides a rational understanding of our place in the universe and can replace the destructive superstitions of the past.⁵⁴

VII. ISSUES OF CONSTITUTIONAL LAW: PRIOR RESTRAINT, OVERBREADTH, AND VAGUENESS

The U.S. case law relating to “basic research” involving U.S. and non-U.S. citizens and the applicability of the ITAR have inclined toward cautious protection of Constitutional First Amendment rights and freedoms. These have been invoked in support and furtherance of safeguarding traditional collaborative avenues of communications among colleagues involved in basic research and even certain aspects of fundamental research. As a general principle, basic and fundamental research collaboration is constitutionally protected under the freedom of speech provision, but with carefully drawn parameters. Exempted data and related information deriving from basic research and certain portions of fundamental research are generally considered to be in the “public domain,” unless otherwise restricted from open dissemination, for example, by an intellectual property right.

⁵³ *Id.* at 4.

⁵⁴ Glashow, *supra* note 51, at 5 (emphasis added).

If public domain scientific research is constitutionally protected free speech,⁵⁵ then there may be numerous issues in the ITAR related to overbreadth, vagueness, and prior restraint. “Overbreadth” issues may arise in areas where the ITAR appear to reach “fundamental” scientific research that is already in the public domain and is more than likely entitled to First Amendment protection.⁵⁶ “The ITAR, at 22 CFR 124.1(a), specifically states that the giving to a foreign national of even public domain information otherwise exempted from licensing is a defense service requiring a license.”⁵⁷

This application is consistent with overbreadth actions that occur when a statute sweeps into constitutionally protected speech that the government may not regulate. The practical consequences of the potentially overbroad ITAR match the overbreadth doctrinal purposes of preventing a chilling effect on free speech and preventing arbitrary or selective enforcement by governmental agents. Within the context of the VSE, there are concerns about a potential chilling effect on intelligent and learned scientists who, uneducated in complex legal analyses, are unable to discern when the ITAR sweeps into areas of fundamental research, and certainly *basic* research, that they thought were protected.

⁵⁵ See International Traffic in Arms Regulations (ITAR) § 120.11 – Public Domain, for what information and data are determined to be in the “public domain” and, therefore, exempt from licensing restrictions.

⁵⁶ Rachel Lehmer Claus, Space-Based Fundamental Research and the ITAR: A Study in Vagueness, Overbreadth, and Prior Restraint, 2 Santa Clara J. Int'l Law 1, 10 (2004). See also Memorandum from the U.S. Department of Justice, Office of the Deputy Assistant Attorney General, on Revised Proposed International Traffic in Arms Regulations (ITAR) (July 5, 1984). The conclusion section of this memorandum states that “[a]s we previously recommended, this remaining overbreadth should be eliminated by more narrowly drafted regulations.”

⁵⁷ Claus, *supra* note 56. Assuming, as we have been, that publicly available scientific information that constitutes fundamental research is protected speech, and given that a violation of the ITAR can result in both criminal and civil penalties, then the licensing requirement is likely to deter speech containing information about fundamental research in the aero-astro field generally or any research taking place in outer space. Such an outcome fairly compels the conclusion that, with regard to public domain information pertaining to space-based or satellite-related research, the ITAR is overbroad and constitutes in application a denial of due process.

Id.

This chilling effect is further exacerbated by ITAR regulators who are willing to implement the regulations expansively based on the somewhat understandable fear of losing their jobs, security clearances, and perhaps violating the ITAR in the process of attempting to implement these less than precise regulations. In any event, to the extent that the ITAR require a license for the export of speech or public domain publications, the licensing scheme imposed by the ITAR might lack the constitutionally required procedural safeguards, thus implicating an issue of unconstitutional prior restraint.⁵⁸

A Constitutional issue of “vagueness” may arise regarding the ITAR. At the heart of all vagueness issues are the same chilling effect and arbitrary or selective enforcement concerns attendant to the overbreadth doctrine. Of particular interest to the VSE might be that “the ITAR’s treatment of public domain information is inconsistent, and in particular founders with regard to what may be considered a ‘defense service.’”⁵⁹

⁵⁸ Claus, *supra* note 56, at 13. “For a licensing requirement on the export of speech to be constitutional, it must be subject to three procedural safeguards: 1) a specific and reasonable time is set for the making of a licensing decision, 2) provision is made for prompt judicial review, and 3) the censor bears the burden of going to court and justifying a licensing denial.” See *FW/PBS, Inc. v. City of Dallas*, 493 U.S. 215, 227-28 (1990) [citing *Freedman v. Maryland*, 380 U.S. 51, 58-60 (1965)]. Further, as noted by Claus, [t]he Arms Export Control Act excludes from the Administrative Procedures Act the functions to be implemented in the ITAR. There is no limit to the time in which the Office of Defense Trade Controls (ODTC) must make a licensing decision. The ITAR does not provide for judicial review of licensing decisions, and the initial designation of items as defense articles is not reviewable. Because there is no such recourse, there is no burden on ODTC to justify any denial. Thus, The ITAR scheme fails on every count. As it pertains to expression concerning space-based or satellite-related fundamental research, it constitutes an impermissible prior restraint on protected speech. Claus, *supra* note 56.

⁵⁹ Claus, *supra* note 56, at 8. Here, Claus also notes that in ITAR Part 124 “Agreements, Off-Shore Procurement, and Other Defense Services,” is the following statement: “The requirements of this section apply whether or not technical data is to be disclosed or used in the performance of the services described in 120.9(a) of this subchapter (e.g., all the information relied upon by the U.S. person in performing the defense service is in the public domain or is otherwise exempt from the licensing requirements of this subchapter pursuant to 125.4 [exemptions of general applicability] of this subchapter). Thus, it appears that one may also be deemed to provide a defense service by innocently engaging in certain transactions other than the explicit ‘training’ of foreign nationals in military skills or use of defense articles. Under this rubric, merely providing a foreign person with public domain information could qualify as providing a defense service.” *Id.* at 23.

For any licensing requirement to meet minimum constitutional criteria when applied to the export of speech involved in collaborative basic, and certain portions of fundamental, research being conducted by U.S. and foreign citizens or entities, three procedural safeguards must be satisfied: 1) “a specific and reasonable time is set for the making of a licensing decision, 2) provision is made for prompt judicial review, and 3) the censor bears the burden of going to court and justifying a license denial.”⁶⁰ As for the basic research scientist, as well as the fundamental and applied scientist, “[t]he ITAR provides for various exclusions and exemptions, but these *limited exemptions* and *exclusions* from licensing requirements *must be well understood* in order to be fully and properly utilized.”⁶¹ In fact, just simply *applying* for a license under ITAR to undertake basic research involving U.S. and foreign citizens, as well as certain aspects of fundamental research that may be covered by the ITAR non-exemptions, likely will be very difficult, frustrating, and time-

⁶⁰ FW/PBS, Inc. v. City of Dallas, 493 U.S. 215, 227-228 (1990) (citing Freedman v. Maryland, 380 U.S. 51, 58-60 (1965)). See also, Claus, *supra* note 56. Claus notes the confusion in pivotal definitions by pointing out that “*fundamental research*” under the ITAR is “openly conducted science and engineering research carried out at institutions of higher education in the United States...Faculty, students, collaborators and other researchers in these institutions engage in the free, constant, and lively exchange of ideas with their peers in the U.S. and abroad. This freedom of speech and association, and the openness that attends it, are fundamental to our culture and vital to the success of our research universities....” *Id.* at 1. Under National Security Decision Directive 189, *supra* note 37, “*fundamental research*” is defined as basic *and* applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community....” Claus continues in footnote 1 by observing that the term “*basic research*” refers to “experimental or theoretical work, undertaken primarily to acquire new knowledge...without anticipating any particular use.” Claus then notes that the term “*applied research*” is used to refer to “similar original research that will result in new knowledge, but directed primarily toward a specific practical objective.” See Claus, *supra* note 56, at n. 1. In fact, fundamental research frequently is closer to applied research than it is to basic or “pure” scientific research.

⁶¹ Liebman *supra* note 42, at 497, 502. Generally speaking, assert the authors, “exclusions from ITAR controls apply to all destinations, whereas exemptions from these controls apply only selectively to favored destinations. Generally, however, what is excluded from...[Department of State] licensing requirements is subject to...[Department of Commerce] jurisdiction [in which the Export Administration Regulations, or EAR, apply]....Most ITAR excluded or exempted items are less rigorously controlled by Commerce...The ITAR implicitly relies on the business community to apply rigorous self-classification procedures to determine whether a given commodity or technology is subject to ITAR export controls.” *Id.*

consuming. Moreover, as emphasized by Claus, “just agreeing to this type of restriction could result in an overly-cautious consideration of the proposal from the moment of submission of the proposed research onward.” Claus also notes that, pursuant to 22 C.F.R. § 120.11(8)(ii), the acceptance of dissemination restrictions precludes characterizing the research as “fundamental.”⁶²

In another area of the ITAR, it also has been observed that, “[d]espite the attention paid to deemed export licensing and compliance, and notwithstanding the general increase in BIS and Directorate of Defense Trade Controls (DDTC) enforcement in other areas, the deemed export rules have not been enforced strictly. Officials have said that a number of cases are being investigated, but there have been few charges or settlements involving deemed exports.”⁶³ In the context of the basic and fundamental research exception,

[I]nformation resulting from corporate funded research, which is almost always proprietary, rarely qualifies under the ‘public domain’ definition. such information, however, may not be subject to the ITAR if the research relates to generic scientific matters rather than to items that are specifically designed, adapted or modified for a military application.⁶⁴

One of the principal concerns with overbreadth and vagueness is the chilling effect they can have on the willingness of scientists to test the waters. This can create a paucity of data points that would be necessary to determine just where the ITAR are impeding progress on the ground beyond implementa-

⁶² Claus, *supra* note 56, at 13. For an analysis of these issues from the perspective of a university and private sector interests, see R.J. Sievert, *Has the Time Finally Arrived to Overhaul the U.S. Export Control Regime?*, 37 TEX. INT’L L.J. 89 (2002).

⁶³ Christopher R. Wall and Pillsbury Winthrop Shaw Pittman, *Controlling the Flow of Technology in Global Operations: Deemed Exports*, 892 PLI/COMM 211, 221 (2006).

⁶⁴ *Id.* at 224, n. 4. Not surprisingly, Wall and Pittman go on to note that “[c]ompliance issues are particularly acute for companies working in areas such as aerospace where products and technology may have both commercial and military applications.” *Id.* at 222. One commentator has suggested that in the context of the satellite industry there is only a small number of “repeat players” that might be better accommodated through the use of “‘standard forms’ of TAAs and related documents.” Philip L. Spector, *Satellite Export Controls: Five Years and Counting*, 18 AIR & SPACE LAW 12, 13 (2003).

tion. The other main concern in the area of overbreadth and vagueness is arbitrary or selective enforcement. These two major concerns can often walk in lockstep as the lack of certainty in enforcement is the most powerful impetus of the chilling effect.

With greater certainty in implementation of the ITAR would come a greater confidence in engaging in the type of scientific exchanges which could help to sketch a more solid understanding if there are any real ITAR impediments to the VSE; certainly those beyond what might otherwise simply be regarded as a fear of overzealous application of the regulations. The fear, also, would derive from a sense of need for caution evolving from uncertainty regarding personal responsibility for potential violations of the ITAR, and the possibility of being subjected to ensuing civil and criminal sanctions and penalties. While there may be constitutional concerns about the ITAR on paper, the best remedy for purposes of the smooth working of the VSE might not be simply to overhaul the regulations, themselves, other than to concentrate uniformity of pivotal words and phrases in their definitions and applications, but also rather to focus on insulating the regulators who are implementing them, and appropriately training the scientists who, in part, are responsible for understanding and complying with them.

VIII. CRIMINAL AND CIVIL SANCTIONS: STATUTES AND CASE LAW

A. Misconceptions Regarding Criminal and Civil Sanctions under the ITAR⁶⁵

As already discussed, the ITAR apply only to export and re-export of services and items as those terms are defined in the regulations, or if a license is otherwise required. A college or university normally asserts emphatically the goals of intellectual freedom on the part of its faculties, as well as the freedom to share openly and in a timely fashion the work of faculty

⁶⁵ For the criminal sanctions and consequent penalties, see International Traffic in Arms Regulations § 120.27.

members and their colleagues. But attempting to assure these freedoms may result in the university and involved faculty or staff breaching the export and re-export control laws.

Given the vagueness and uncertainty about what is covered by the ITAR, much of the subsequent and predictable concern is being borne out not just in the stifling of research pursuits, but also in the amount of attention scientists are paying to the ITAR at all. The misconception that compliance and enforcement of the ITAR is aimed only at large corporate entities, and not at seemingly innocuous university-based research is pervasive (at least until relatively recently when awareness and concern is elevating rapidly) throughout academia.⁶⁶ Even many scientists conducting basic research outside of academia are not aware of what is covered by the ITAR, and any attempt to find out might be in vain. The inevitable frustration stemming from vagueness and overbreadth issues in the ITAR has led to a lack of awareness and attention paid to the ITAR which could lead to severe penalties for scientists involved in basic research. Willful ignorance of the consequences of ITAR violations in a post-9/11 world might seem several orders of magnitude less appealing to scientists and researchers if they were better informed about the potential criminal and civil penalties of such violations.

All United States citizens who export defense articles are required to obtain a license from the Department of State.⁶⁷ Therefore, the most critical question a scientist engaged in basic research faces with respect to the ITAR compliance is whether their research constitutes a defense article.⁶⁸ Alternatively stated, the main concern of a basic research scientist is whether his/her research is exempt on the basis of the fundamental re-

⁶⁶ For a general discussion of the problems and issues related to misconceptions regarding application of the ITAR, see R. Rege, *Universities Should Implement Internal Control Programs to Monitor Compliance with Export Control Laws*, 35 *J.L. & Educ.* 199 (2006).

⁶⁷ 22 C.F.R. § 120.4. A scientist involved in basic research may file a request at any time and would only have to register the project if it were deemed to be covered by the ITAR. 22 C.F.R. § 120.4(b).

⁶⁸ See generally Philip S. Rhoads, *The International Traffic in Arms Regulations: Compliance and Enforcement in the Directorate of Defense Trade Controls*, U.S. Department of State, 892 PLI/COMM 245, 250 (2006).

search exception. Such contemplation can lead to a great deal of confusion and uncertainty, which has led many scientists to throw up their hands and continue business as usual, perhaps all the while unaware of the grave potential penalties for ITAR violations.

The ostensibly preferred route for scientists to take whenever uncertainty arises as to whether their research is exempt is to file a commodity jurisdiction request with the Directorate of Defense Trade Controls (DTC) at the Department of State.⁶⁹ A paradoxical situation may be created however by the inherent vagueness and overbreadth of the ITAR. The more scientists, acting in good faith, are willing and able to scrutinize and dissect the complexity of the ITAR the more they will become uncertain about its coverage, thus creating the impulse to request clarification. Experience has shown however that the commodity jurisdiction request process can be both debilitating and pernicious to scientific research, both in the length of the process and in its lack of transparency.⁷⁰

In March of 2001, the Office of Inspector General (OIG) produced a memo on the findings of an assessment of the export licensing process.⁷¹ While the licensing process was found to be successful at protecting national security, the OIG concluded that the review process "took far too long and was not always transparent."⁷² In April 1996, the National Security Council (NSC) provided the Department of State with guidelines providing that the commodity jurisdiction process was to take no longer than 60 days in a routine determination, and no more than 95 days in any situation.⁷³ Nonetheless, the OIG's review of twenty sample requests showed that the average processing

⁶⁹ 22 C.F.R. § 120.4. A scientist involved in basic research may file a request at any time and would only have to register the project if it were deemed to be covered by the ITAR. 22 C.F.R. § 120.4(b).

⁷⁰ United States Department of State and the Broadcasting Board of Governors, Office of Inspector General, Review of the U.S. Munitions List and the Commodity Jurisdiction Process, Memorandum Report 01-FP-M-027 (March 2001) (finding that the commodity jurisdiction process needed improvement in the areas of timeliness and transparency) [hereinafter *OIG Memo*].

⁷¹ *Id.*

⁷² *Id.* at 7.

⁷³ *Id.* at 2-3.

time was almost six and a half months, well over three times the amount prescribed for a routine determination.⁷⁴

Irrespective of the NSC's guidelines, the ITAR themselves state that DTC

[W]ill provide a preliminary response within 10 working days of receipt of a complete request for commodity jurisdiction. If after 45 days the Directorate of Defense Trade Controls has not provided a final commodity jurisdiction determination, the applicant may request in writing to the Director, Office of Defense Trade Controls Policy that this determination be given expedited processing.⁷⁵

Apparently, the ambitious drafters of the ITAR were confident that they could not only meet, but also exceed, the NSC's temporal guidelines for request processing. If the actual processing time in practice under this ITAR provision is in any way proportionate to the response time in the sample OIG cases in relation to the NSC guidelines, scientists still interested in sending requests to the Department of State will be left with much to be desired by way of expediency in the process. The OIG study also concluded that transparency problems exist in the request for commodity jurisdiction process. Simply put, scientists conducting basic research under time pressure imposed by grants and competing researchers have neither the time nor the patience necessary to freeze their projects while awaiting clarification. These constraints might very well simultaneously serve to encourage scientists to remain willfully ignorant of the ITAR compliance issues while at the same time discouraging them from becoming entangled in a lengthy and confusing review process. The catch-22 for those engaged in basic research is that it is the very vagueness of the ITAR coverage itself that

⁷⁴ *Id.* at 7. Much of the reason for the delays was found to be the amount of time that it took the Department of Defense and the Department of Commerce to respond to referrals from DTC. According to the NSC guidelines, except in extraordinary circumstances, both Departments are supposed to return referrals to DTC within 35 days. No such deadlines were ever imposed on the Departments by DTC. In the twenty sample cases examined by the OIG, Commerce averaged 110 days to respond to such referrals, and Defense 88 days.

⁷⁵ 22 C.F.R. § 120.4(e).

creates the need to request clarification to avoid non-compliance; either researchers take a chance of being penalized, or guarantee themselves a protracted delay for review that may be the functional equivalent to nullification of their research project.⁷⁶

It would not be surprising if even the most learned and informed scientist privy to all of the long and winding corridors of the ITAR compliance might be enticed to just ignore it all together and plead ignorance if an issue were to arise. Given the severe penalties that could be levied on individual scientists, however, which appear woefully disproportionate to anyone but the largest habitual corporate offenders, the issue of ITAR enforcement is one that scientists ignore at their own peril. Many scientists still believe that the employing university would be subject to the penalties, and not the scientists themselves.

If an item or commodity is covered by the ITAR, then the first step of compliance is registration with the Department of State.⁷⁷ Another twist in the ITAR definitional labyrinth crops up again here, however, as one of the ITAR hydra-headed definitions of “research” flirts with the notion of “basic research” in the context of registration. Specifically, “[r]egistration is not required for . . . [p]ersons who engage only in the fabrication of articles for experimental or scientific purpose, including research and development.”⁷⁸ In making a determination if his or her research qualifies for this exception to registration, a scientist finds oneself having come full circle to where they entered the ITAR maze; at the blurred distinction between basic and applied research.⁷⁹

⁷⁶ Until recently, many individuals engaged in basic scientific research thought it worth the gamble to proceed without clarification. The balance of interests may be shaped by lack of awareness of the severity of the penalties coupled with the misperception that sanctions would only be imposed on large corporations, the exports of which could pose serious national security threats. Further, many scientists still believe that the employing university would be subject to penalties and not the scientists, themselves.

⁷⁷ 22 C.F.R. § 122.

⁷⁸ 22 C.F.R. § 122.1(b)(4).

⁷⁹ As one scholar points out, “one must determine at what point experimentation and product development cross the line from pure research into the ‘manufacturing’ of a defense article.” See Rhoades, *supra* note 68, at 252. (discussing the exceptions to the registration requirement). The same scholar wisely suggests at p. 253 that “[w]ith an

However verbose and mind-numbingly complicated the ITAR may be, lawmakers have made it abundantly clear in no equivocal terms that violations will be dealt with severely. With even a single isolated violation of any part of the ITAR carrying criminal penalties of up to \$1,000,000 in fines and up to a ten year prison sentence,⁸⁰ it behooves even the most casual scientific researcher to pay attention to compliance with the ITAR. Any conviction of a criminal compliance violation also results in immediate statutory debarment, explained below. Each civil violation could result in a maximum fine of \$500,000 per violation⁸¹ and could also result in seizure and forfeiture of items, administrative debarment and cross-debarment, and the loss of the right to contract with the U.S. Government.⁸² For each violation, the Department of State assesses the circumstances and seriousness of the violation to determine whether to pursue criminal or civil penalties, or both. As one scholar has noted:

An understanding of the purpose and use of the defense article, defense service and technical data is essential for a proper assessment of potential harm to national security that can be caused by unauthorized exports. The Directorate calls on the expertise of the Defense Technology Security Administration (DTSA) for this purpose. For consideration in determining the appropriate enforcement response, DTSA provides DTCC a harm assessment of ITAR violations based on the specific munitions at issue and national security harm that access by specified end-users to the defense article, defense services and/or technical data may have caused.⁸³

It used to be the case that the Department of State usually would only pursue civil penalties in conjunction with a criminal plea agreement.⁸⁴ However, a recent trend has emerged whereby

emphasis at many universities on identifying profit opportunities for products and processes developed in research laboratories, ITAR registration and concomitant licensing requirements must be taken into account when products and technology that emerge from this academic setting are introduced into global markets." *Id.* at 253.

⁸⁰ 22 C.F.R. § 127.3; 22 U.S.C. § 2778(c).

⁸¹ 22 U.S.C. § 2778(e).

⁸² Rhoades, *supra* note 68, at 267.

⁸³ *Id.* at 281, n.63.

⁸⁴ *Id.* at 269.

the Department has begun seeking civil sanctions absent an ongoing criminal case, or instead of pursuing criminal actions.⁸⁵ This should be interpreted as a warning to individuals who may have developed a false sense of security that the Department will only go after the establishment juggernauts who or which have the potential to create a gaping breach in national security. The gauntlet has been thrown down and in a post-9/11 United States, the willingness to pursue civil sanctions in circumstances where criminal action may not be warranted, serves as notice that no one can expect to fly safely under the radar anymore.

In addition to pecuniary and imprisonment penalties, violations may also result in the loss of the privilege to export in the future, a penalty referred to as debarment. Debarment can be defined as the act of prohibiting “any person from participating directly or indirectly in the export of defense articles, including technical data, or in the furnishing of defense services for which a license or approval is required.”⁸⁶ The term debarment includes both statutory and administrative debarment. At the top of this list are the mandatory license denials and revocations of §126.7(a). These are the actions defined in the ITAR as “statutory debarment.” Persons convicted for violations of the Arms Export Control Act face an immediate lock-down of their defense trade. Debarment is automatic upon conviction. DTCC generally follows up with a letter to the debarred party and publication of a notice in the Federal Register.

Aside from very narrowly defined grounds for an exception, license requests will be denied for all applications in which the debarred party, and an affiliated or successor entity, appears as the applicant, source or manufacturer of the defense article or defense service, or has a significant interest in the transaction.⁸⁷

⁸⁵ *Id.*

⁸⁶ 22 C.F.R. § 127.7(a).

⁸⁷ Debarment following any conviction under the Arms Export Control Act is based on sound reasoning. Criminal violations require a showing of willful conduct, a clear indication that convicted companies and individuals cannot be relied upon to export U.S.-origin defense articles, services, and technology in a responsible manner. Although the debarred party may apply for reinstatement three years after the date of conviction, export privileges are not automatically reinstated once that time has passed. Significant

Statutory debarments are mandatory and immediate license denials and revocations follow a criminal conviction of any violation of the ITAR.⁸⁸ A debarred party may apply for reinstatement three years after their conviction but must be able to demonstrate rehabilitation.⁸⁹ By contrast, a civil violation carries with it the possible imposition of administrative debarment. The Arms Export Control Act “authorizes the Secretary of State to revoke, suspend or amend licenses or other written approvals whenever the Secretary deems such action to be advisable.”⁹⁰

A wide degree of latitude has been granted to the Department of State “[b]ecause the exercising of the foreign affairs function, including the decisions required to implement the Arms Export Control Act, is highly discretionary, it is excluded from review under the Administrative Procedure Act.”⁹¹ Consequently, debarment may be imposed without prior notice in certain situations, including the following category of circumstances, which can only be described as a “catch-all” provision of monolithic proportions:

Any license or other approval or exemption granted under this subchapter may be revoked, suspended, or amended without prior notice whenever . . . [t]he Department of State deems such action to be in furtherance of world peace, the national security or the foreign policy of the United States, or is otherwise advisable.⁹²

With increasing focus on accountability of scientists, as well as academic and commercial/industrial entities, under the ITAR, encouraged in part even by the unclassified version of the 2006 U.S. National Space Policy, scientists involved in basic and fundamental research are not in a position to ignore the com-

rehabilitative steps must be taken and fulfilled that mitigate law enforcement concerns. Because the exercising of the foreign affairs function, including the decision required to implement the Arms Export Control Act, is highly discretionary, it is excluded from review under the Administrative Procedures Act, whereby the U.S. Government normally enforces implementing regulations for legislative acts (5 USC chp. 5, §§ 511-599).

⁸⁸ 22 C.F.R. § 127.7(c).

⁸⁹ *Id.* See also, Rhoades, *supra* note 68, at 262-63.

⁹⁰ 22 C.F.R. § 128.1.

⁹¹ *Id.*

⁹² 22 CFR § 126.7(a)(1).

plexities of the regulations, or rely totally on someone else to ensure their compliance. Several scientists have attested to the past practices of indifference to the personal accountability of scientists and engineers under the civil and criminal penalties of the ITAR, and their increasing frustrations with the lack of continuity in the interpretation of the regulations and their applications to research proposals, research under way, and traditional avenues of collaboration among colleagues involved in basic and fundamental research.⁹³

IX. INDEMNIFICATION RESOLUTIONS AND DIRECTORS AND OFFICERS LIABILITY INSURANCE: AN ESSENTIAL TOOL FOR SCIENTIFIC RESEARCH IN ACADEMIA AND INDUSTRY

Given the complexity, inconsistency, and resulting confusion created by the broad disparity in interpretation and application of national defense security laws and regulations to all types of scientific research in endlessly different types of fact situations, it is imperative that the scientists involved in such research be provided necessary and reasonable protection and support. It is the *minimum* requirement to ensure that such research, particularly unblemished basic research in its purest form, is continued by the best and most appropriate individuals available. A frontline approach to providing the necessary protection of, and encouragement to, scientists falls under the traditional protective clothing of "indemnification resolutions."

More often than not, scientists, particularly those who believe properly or mistakenly that their research is basic in the context of science and security regulations, can be subjected to extraordinary expenses once an investigation or accusation against the individual under the ITAR has been initiated. The objective should be to ensure that, under the proper circumstances, scientists working in academia and industry are protected from unnecessary and extraordinary personal expenses in defending themselves from the incipient stages of an ITAR violation investigation through legal procedures involving criminal and civil sanctions and penalties, or both.

⁹³ See generally, SPACE SCIENCE AND THE INTERNATIONAL TRAFFIC, *supra* note 10.

Normally, the greatest expense at the outset to an individual conducting scientific research, basic and/or applied, and who finds himself/herself the subject of potential civil or criminal wrongdoing, is the expense of retaining legal representation. Most universities, other non-profit entities, and industries address this concern and expense by relying on state statutes requiring certain types of legal expense reimbursement or advances, or by adopting their own indemnification policies covering officers and employees. The vagueness, complexities, and time-consuming aspects involved with the ITAR, even if covered by indemnification resolutions and legal representation and damages/penalties insurance, are sufficient to discourage even the most attentive and knowledgeable scientist, not to mention foreign colleagues, students, and research associates.

A. What does the Average Indemnification Policy Cover?

What does the standard indemnification resolution and policy usually cover with respect to protecting employees, keeping in mind that Federal employees do not “enjoy” this kind of protection in carrying out their perceived duties? With variations that can be significant, the discussion, below, addresses certain provisions usually found in indemnification resolutions of educational and other non-profit entities.

Employees [presumably including scientists and their respective staffs], and specifically-named individuals who are acting as *designated agents* of an organization, are normally covered by that organization’s indemnification resolution policy. Usually, any covered person who was or is a party, or is threatened to be made a party to any threatened, pending, or completed action, suit, or proceeding, whether civil, criminal, administrative, arbitratative, or investigative, by reason of the fact that he or she is or was a covered person *found to be acting within the scope of his or her employment and in furtherance of his or her official duties*, will be reimbursed or advanced *necessary* expenses or *otherwise indemnified* by the employing organization (including attorneys’ fees), judgments, fines, penalties, and amounts paid in settlement actually and *reasonably incurred* by him or her *in connection with such* action, suit, or proceeding *if* he or she *acted in good faith* and in a manner he

or she *reasonably believed* to be in or not opposed to the *best interest* of the employer will be indemnified by the employing organization, and, with respect to any criminal action or proceeding, had *no reasonable cause to believe his or her conduct was unlawful*; provided, however, that no indemnification shall be made in respect of any claim, issue, or matter as to which such covered person shall have committed *intentional, willful, or reckless misconduct or gross negligence* in the performance of his or her duty to the employing organization, unless and only to the extent that a court of competent jurisdiction shall determine upon application that, despite the adjudication of liability, but *in view of all the circumstances* of the case, such covered person is *fairly and reasonably* entitled to indemnity for such expenses which the court shall deem proper.⁹⁴

All of the italicized words and phrases demand definition and interpretation, both standing alone and in the context of what is usually a very complex and unfolding fact situation. Phrases such as “reckless misconduct” and “gross negligence” have volumes of statutory and case law surrounding their interpretations in varying contexts. A scientist may well consider another line of professional endeavor after just looking at the italicized words and phrases. But that is not all. The following terms of coverage also are standard in some form in most indemnification policies and resolutions:

Notwithstanding any other provision of this Policy, a covered person who has been successful, on the merits or otherwise, in the defense of any action, suit, or proceeding (referred to above) to which he or she was a party shall be indemnified against expenses (including attorneys’ fees) actually and rea-

⁹⁴ These provisions are extracted, and modified as appropriate, from the January 24, 2000 “Revised Smithsonian Institution Indemnification Policy” approved by the Institution’s Board of Regents. In several respects, even this indemnification resolution may be considered deficient in its coverage of Smithsonian scientists and other staff employees. See, Smithsonian Institution Board of Regents, *Revised Smithsonian Institution Indemnification Policy* (Jan. 24, 2000) (on file with the Smithsonian’s Office of General Counsel, Washington, D.C.) (emphasis added).

sonably incurred by him or her in connection with such action, suit, or proceeding.⁹⁵

Usually, before a scientist or other covered person under the indemnification policy resolution can seek outside counsel, they must contact the university or foundation legal counsel and the State attorney-general's office to discuss the matter. Once those individuals decide there might be a conflict of interest, for example, between the scientist/staff member(s) and the employing university or non-profit entity, the scientist may be authorized or otherwise encouraged to retain private counsel, with or without approval of the employing entity. And that is where the truly damaging personal expenses start, along with the professional disparagement (more frequently than not unjustified) that may well ensue *regardless of the element of guilt*. Finally, many, if not most, indemnification policies and resolutions might include the following type of provision:

Reasonable expenses incurred in defending any threatened, pending, or completed civil or criminal action, suit, or proceeding, shall be paid by the employer in advance of the final disposition of such action, suit, or proceeding, if the covered person shall undertake to repay such amount in the event that it is ultimately determined he is not entitled to such indemnification. The advance payments will be terminated if at any time it is determined that such covered person acted in bad faith and in a manner opposed to the best interests of the employing organization, or, with respect to any criminal proceeding, such covered person had reasonable cause to believe that his or her conduct was unlawful.⁹⁶

Simply put, there are too many ambiguous escape clauses for any potential scientist beneficiary of the average indemnification policy and resolution to rely on it as a source of legal and other fees. State and federal employees may not have the benefit of these payments if state or federally appropriated funds are relied on. Non-appropriated private funding must be used. And the state and federal governments are the entities interpreting,

⁹⁵ *Id.*

⁹⁶ *Id.*

applying, and enforcing the ITAR. If they make a mistake, are they immune from investigation, prosecution, and applicable penalties? If they are completely relied upon to make an ITAR determination regarding the basic or applied (fundamental) research proposal from the outset and at incremental phases along the avenue of pursuing the research, can they share in any of that immunity, unlawful activity, ill motivation, and gross negligence, etc., notwithstanding? Numerous complex legal, factual, and fiscal questions must be asked by a scientist and involved colleagues, and satisfactorily answered, before the scientist/colleagues can decide whether and how to undertake the financial onus personally when the ITAR issue might arise. Nevertheless, a careful and close assessment and fine-tuning of a standard indemnification policy and resolution ought to be pursued by NASA and other relevant agencies, universities, industries, and non-profit organizations that would properly protect scientists from the vagueness, vagaries, and extraordinary personal costs of the ITAR and their interpretations and applications.

B. How is the Coverage Financed?

Normally, under an indemnification resolution, an entity is authorized to purchase and maintain insurance on behalf of any covered person with respect to liability asserted against him or her, or incurred by him or her, in the covered capacity. This is true of other covered individuals regarding activities arising out of his or her status, regardless of whether the employing entity would have the power to indemnify him or her against such liability under the various provisions of the indemnification policy, such as those noted above. Such insurance would normally come in the way of a standard Directors and Officers liability policy, or specifically tailored provisions of such a policy suited to the insured entity. Given the potential breadth of coverage in an ITAR action, and the significant fiscal penalties that may be involved, the policy would be comparatively expensive; often a deterrent.

Another avenue is to have the employing entity set aside a specific fund that all employees pay into routinely for indemnifi-

cation purposes. Finally, individual employees can take advantage of private insurance plans to protect them from financial losses arising from ITAR implementations and civil penalties. Unfortunately, the limits placed on such private protection policies are too low to make them viable options when complex and potentially lengthy legal representation is likely to be required. These exposures to personal financial losses over protracted proceedings that may not reveal the existence or extent of liability or wrong-doing until the end of the proceedings over a period of years can frequently lead to otherwise inadvisable plea-bargaining in the case of criminal sanctions. Civil penalty settlements might be negotiated that may not be justified except for convenience and lessening the impact of protracted proceedings and seriously compromised professional reputations that would likely occur, depending upon the fact situation.

C. Appeals Procedures

Under Sec. 120.4 of the ITAR, the jurisdiction and procedures are set forth involving the U.S. Government if any doubt exists regarding an article or service that might be covered by the U.S. Munitions List. It also can be used for consideration of a redesignation of an article or service currently covered by the USML. Nevertheless, the Department of State is required to provide notice to Congress at least 30 days before any item is removed from the List. Further, upon written request, the Directorate of Defense Trade Controls “shall provide a determination of whether a particular article or service is covered” by the USML, and the determination has to be consistent with Secs. 120.2, 120.3, and 120.4 of the ITAR. The process requires “consultation among the Departments of State, Defense, Commerce and other U.S. Government agencies and industry in appropriate cases.”⁹⁷

⁹⁷ See Directorate of Defense Trade Controls, www.pmdtc.org. See also an unclassified executive summary of a review of the U.S. Munitions List and the commodity jurisdiction process in March 2001 by the Department of State, Office of the Inspector General stating that the “National Defense Authorization Act for FY 2000, Public Law 106-65, Title XIV, Section 1402, Annual Report on Transfers of Militarily Sensitive Technology to Countries and Entities of Concern, requires the Inspectors General of the De-

Upon completion of a 1993 review, the OIG determined that the policies and procedures for developing, maintaining, and revising the USML were adequately protecting the export of militarily sensitive technologies. Nevertheless, the Defense Trade Control had not performed a comprehensive review of the USML since 1993, and the list reflected an attempt to control too many items and services unnecessarily. Herein rests the second significant delay in the ITAR process that must be overcome to allow scientists and research administrators to conduct necessary basic and fundamental research in a reasonably timely fashion.⁹⁸

X. CURRENT STATUS OF ITAR REVIEW AND CORRECTIVE ACTIONS BY THE U.S. GOVERNMENT

An interesting approach to helping solve the confusion, complexities, and fears of civil and criminal actions being endured, or potentially so, by scientists involved in basic research and the traditional need and practices of open dialogue and international collaboration among peers, as well as many of the ITAR enforcement officials concerned with the growing lack of continuity in interpretation and application of the ITAR, is one of developing formal treaty relationships with specific U.S. military/political allies, and also select partners in the global economy. A longstanding relationship has existed between the United States and Canada regarding ITAR exemptions relating to the latter's defense trade control practices, and as of 2007, after lengthy assertions of concern surrounding such issues as who qualifies as a "foreign resident" under Canadian law, the restoration of ITAR exemptions for Canada have been addressed satisfactorily.

One recent attempt, presently extant but with expectation that it will enter into force in 2008, is the draft US-UK Defense

partments of Commerce, Defense, Energy, and State to audit the U.S. Government policies and procedures for export of technologies and technical information to countries and entities of concern." Office of Inspector General, Review of the U.S. Munitions List and the Commodity Jurisdiction Process, Memorandum Report 01-FP-M-027 (Mar. 2001) (on file with author) [hereinafter *Review of the U.S. Munitions List*].

⁹⁸ *Review of the U.S. Munitions List*, *supra* note 97, at Executive Summary.

Trade Co-operation Treaty.⁹⁹ The general objective of the document is to formulate an operating framework that will allow smoother and closer defense and general security cooperation between the two countries. This would be achieved primarily by reducing the number and types of restrictions to relevant exchanges of defense goods and services, including information, between the two nations. Similar agreements between the United States and Australia, as well as other defense allied nations, have been signed or otherwise addressed as partial resolutions of the problems created by the current implementation of the ITAR and EAR requirements.

In February 2008, a briefing report of the Working Group established by the Center for Strategic & International Studies (CSIS), Washington, D.C., to review and offer recommendations regarding *The Health of the U.S. Space Industrial Base and the Impact of Export Controls*¹⁰⁰, was published and made available to the public. The principal objective of the expert study group, in the context of U.S. National Space Policy of August 31, 2006,¹⁰¹ was to “[1] review previous and ongoing studies on export controls and the U.S. space industrial base and [2] assess the health of the U.S. space industrial base and determine if there is any adverse impact from export controls, particularly on the lower-tier contractors.” This expert working group was also tasked with reviewing “the results of the economic survey of the U.S. space industrial base conducted by the Department of

⁹⁹ On June 26, 2007, President George W. Bush and U.K. Prime Minister Tony Blair signed the U.S. – U.K. Defense Trade Cooperation Treaty. It was forwarded to the United States Congress at the end of 2007 for advice and consent and ratification. See, U.S. Department of State Fact Sheet, *The U.S. – U.K. Defense Trade Cooperation Treaty* (Aug. 10, 2007), <http://www.state.gov/t/pm/rls/fs/90740.htm>.

¹⁰⁰ Pierre Chao, *Health of the U.S. Space Industrial Base and the Impact of Export Controls* (Feb. 18, 2008), available at http://www.csis.org/index.php?option=com_csis_pubs&task=view&id=4381.

¹⁰¹ The Statement of Task of the Working Group was formulated in the context of the preamble to the 2006 U.S. National Space Policy, i.e., “In order to increase knowledge, discovery, economic prosperity, and to enhance the national security, the United States must have robust, effective, and efficient space capabilities.” Nowhere in this Space Policy are the words “knowledge” and “discovery” defined, whether carefully or even within a reasonably general context. The Statement of Task in the CSIS Working Group briefing of February 2008 refers only to reviews of export controls impacting the U.S. space industrial base. Nowhere is the word “base” in this context broken down to include “basic” research, i.e., knowledge solely for the sake of knowledge.

Commerce and analyzed by the Air Force Research Laboratory....”¹⁰²

In its Executive Summary, the CSIS Working Group did make a vague reference to the potential for basic research being an area of concern “within the broader health of the industry.”¹⁰³ Further, in recommendations made by the Working Group, it was asserted that

The Secretary of Defense and NASA Administrator, in addition to the Secretary of State, should have the authority to grant real-time, case-by-case, specific time period exemptions for anomaly resolutions deemed to be in the national interest based on criteria from the National Space Policy.¹⁰⁴

Again, no definitive characterizations appear in the briefing report of what constitutes an “anomaly” and an “anomaly resolution”; at least sufficiently definitive to invoke the necessary constitutional clarity required for application of criminal penalties under the ITAR. At best, these terms invoke a certain amount of curiosity and guesswork as to what they might include, but do suggest more that the regulatory exemptions for basic, if not fundamental, research would not be applicable.

Lack of specificity in definitions of basic, applied, and fundamental research, in addition to vague words and phrases such as “innovation” and “anomalous resolutions”, should not be the basis for invoking penalties for failure to comply with the applicable ITAR provisions relating to exemption criteria. Again, the Working Group briefing refers to the 2nd and 3rd tier of industry that is being adversely affected in global economic competitiveness by the export control laws, and that these tiers of industry are “the source of much innovation.” Clearly, the focus of the study and recommendations remains on directed or applied research.

¹⁰² Briefing of the Working Group on the Health of the U.S. Space Industrial Base and the Impact of Export Controls, at 3, *available at* http://www.csis.org/index.php?option=com_csis_pubs&task=view&id=4381.

¹⁰³ *Id.* at 7.

¹⁰⁴ *Id.* at 40, at Recommendation 6.

Again, there is no definition of what constitutes “innovation,” except that it must be the product of 2nd and 3rd tier companies that are “the most engaged in the global market place in the aerospace/defense sector.” This is hardly a term one would use, then, to describe “basic” research.¹⁰⁵ Further, does reference to “industrial base” include basic research? Does reference to exemptions for “anomaly resolutions” incorporate the criteria for conducting basic research?¹⁰⁶ Again, it is posited here that there is lack of specificity and clarity sufficient to invoke serious civil and criminal penalties for violations of the ITAR.

In many respects, the CSIS Working Group briefing of February 2008 perpetuates the confusion relating to what constitutes basic research, and is focused almost exclusively on the end of the fundamental research spectrum that transitions into applied research. Nevertheless, under its “Findings 7: U.S. leadership in space benefits significantly from access to foreign innovation and human capital, but access is becoming increasingly difficult,” the Working Group noted that “The key to maintaining U.S. technological preeminence is to encourage open and collaborative basic research. The linkage between the free exchange of ideas and scientific innovation, prosperity, and national security is undeniable.”¹⁰⁷ This is the only reference to basic research in its proper context, but still without specific definition, and only with reference to prosperity and national security, which seems more like directed or applied research than research seeking knowledge purely for the sake of having that knowledge. It is clear that the only issues relating to the ITAR and basic research exemptions being focused upon by the CSIS Working Group are those with direct and often immediate relevance to national security and relatively quick enhancement of U.S. economic competitiveness in the global space industry. Protection, encouragement, and cultivation of the foundation upon which directed or applied research is dependent, i.e., basic research, remains at best a diminishing remnant of the history

¹⁰⁵ *Id.* at 10.

¹⁰⁶ *Id.* at 11.

¹⁰⁷ *Id.* at 25.

of hominid evolution. And, yet, contemporary basic research is a critical not only to the survival of civilizations, but perhaps to the species, *Homo sapiens*, itself.

XI. CONCLUSIONS

Unfortunately, much confusion continues on the part of the regulated individuals and entities, and even on the part of many of the regulating authorities. Controlling the flow of weapons and weapons-related technology by various nations and civilizations has a long history, mostly of failures. Under the U.S. Arms Export Control Act and the implementing ITAR and EAR, there is a confusing disparity in definitions, interpretations, and applications at many levels of the export control process, with a resulting chilling effect on the initiatives of private commercial interests resulting in the loss of business opportunities by U.S. industry.

When the ITAR responsibilities were picked up by the Department of State, a very significant part of the U.S. competition in the international high tech marketplace was placed in the hands of exceedingly cautious and “hyper-legalistic” staff of the Department’s routine bureaucracy. The implementation of the ITAR was, at best, sluggish, and mostly at the expense of industry and the often time critical requirements of those involved in scientific research. But lost opportunities also are experienced by those individuals and institutions involved in conducting truly basic research. A resulting “brain drain” reversal away from the United States and its interests has been under way at a steadily increasing rate since 1999 when Congress transferred ITAR responsibilities for the space-related activities, among others, from the Department of Commerce to the Department of State.¹⁰⁸

¹⁰⁸ See *SPACE SCIENCE AND THE INTERNATIONAL TRAFFIC*, supra note 10, at 1 (“contravening U.S. interests in attracting foreign students to U.S. universities, the capture of space technology by ITAR has caused serious problems in the teaching of university space science and engineering classes, virtually all of which include non-U.S. students”). As noted in the CSIS Working Group Briefing, “Given that foreign students earn more than half of the science, technology and engineering PhD’s and foreign-born workers make up more than a quarter of the U.S. ST&E workforce...the inability to access this

The fiscal and professional costs incurred simply by the lengthy documentation of Fundamental Research Exemptions; the negotiations and costs of implementing the ITAR; costs of educating faculties and university/industry management about the ITAR and their implementation; lack of useful and timely guidance to scientists and administrators; non-resolution of contract “flow down” issues; restrictions on professional publications; and the costs of walking away from the burgeoning expenses of implementing the ITAR and achieving Fundamental Research Exemptions, are all remaining or becoming increasingly unacceptable realities, both for universities and private industry. There are times and circumstances when the implementation of the ITARS can be self-defeating for the very interests they were intended to protect.

Just as important, and perhaps even more so, is the serious and growing indifference to, and lack of recognition by, the U.S. public and private sectors that *basic* research is critical to the survival and evolution of its civilization...any civilization. Justifiably or not, basic research tends to be sacrificed rather easily for the sake of pressing, but for the most part legitimate, short term requirements of national defense interests, international economic competitiveness of the United States, and the long term public benefits that derive from unintended or unforeseen consequences of seeking knowledge purely for the sake of knowledge. But pressing needs of this nature cannot justify dispensing altogether, or even in a significant fashion, with the critical requisite for on-going basic research conducted in the traditional, globally-transparent manner.

As discussed above, certain localized and short term “fixes” have been initiated and some have been implemented. Nevertheless, the White House and the Congress will have to come together during the post George W. Bush presidency to formulate and pass comprehensive remedial legislation, perhaps of the nature suggested in the CSIS February 2008 “Briefing of the Working Group on the Health of the U.S. Space Industrial Base and the Impact of Export Controls,” that will become effective as

group automatically shrinks the available talent pool....Furthermore the total applications of foreign graduate students to U.S. universities was down 19% in 2004-2007.”

soon as possible. If there is any unnecessary delay in addressing this need, the issues and problems created by the current confusion and inconsistencies of the ITAR applications, particularly with respect to the conduct of space activities and space-related basic research, may well cost the United States significant leads in certain areas of space technology, national defense interests, and international economic competition in the long as well as short run. "Serendipity" in all likelihood will be eliminated from the free world's scientific lexicon of uninhibited curiosity and open basic research collaboration, and the survival of civilizations based upon unrestricted collegial inquiry occurring in the global public domain once again will become a subject of intense lamenting.

A SLEEPING BEAUTY AWAKENS: THE 1968 RESCUE AGREEMENT AFTER FORTY YEARS

*Frans G. von der Dunk**

1. THE RESCUE AGREEMENT: A SLEEPING BEAUTY...?

Forty years ago, the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, was put into place as the second treaty on outer space drafted in the bosom of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS).¹ More precisely, on 19 December 1967 the text was officially adopted by means of U.N. General Assembly Resolution 2345 (XXII), it was opened for signature on 22 April 1968, and the agreement entered into force before the end of the year, on 3 December 1968.² The Rescue Agreement followed on the heels of the Outer Space Treaty³, and in turn was followed by the Liability Convention⁴, the Registration Convention⁵ and the Moon Agreement,⁶ before political developments made COPUOS weary to draft any further treaties on space. The Rescue Agreement is the shortest of them all, counting ten Articles as against the seventeen of the Outer Space Treaty, the twenty-

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¹ Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, U.S.-Gr. Brit.-U.S.S.R., Apr. 22, 1968, 19 U.S.T. 7570 [hereinafter Rescue Agreement].

² See UNITED NATIONS TREATIES & PRINCIPLES ON OUTER SPACE & OTHER RELATED GENERAL ASSEMBLY RESOLUTIONS at v., U.N. Doc. ST/SPACE/11/Rev. 1, U.N. Sales No. 05.I.90 (2005) (detailing the chronology of the Rescue Agreement).

³ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, U.S.-Gr. Brit.-U.S.S.R., Jan. 27, 1967, 18 U.S.T. 2410 [hereinafter Outer Space Treaty].

⁴ Convention on International Liability for Damage Caused by Space Objects, U.S.-Gr. Brit.-U.S.S.R., Mar. 29, 1972, 24 U.S.T. 2389 [hereinafter Liability Convention].

⁵ Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695 [hereinafter Registration Convention].

⁶ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec.18 1979, 1363 U.N.T.S. 3 [hereinafter Moon Agreement].

eight of the Liability Convention, the twelve of the Registration Convention, and the twenty-one of the Moon Agreement.

Is it for that reason that the Rescue Agreement in international literature has always been largely neglected, or at least treated as a sleeping beauty? The Outer Space Treaty, though providing for at least as much provisions wide open to various interpretations as clear law, has with its grand scheme provided the foundations for all the rest of space law, and for that reason alone has always captured the imagination. The Liability Convention considered the possibility that something might go horribly wrong in space, and further considered the monetary retribution that might result. Though never formally invoked, for that sole reason it continues to be the subject of debate amongst space and other lawyers. The possible exception here, of the *Cosmos 954* accident, is illustrative also for the fate of the Rescue Agreement in this regard. All the attention regarding legal consequences of the accident were on liability issues and the possible results of applying the Liability Convention in that area, rather than the Rescue Agreement as it actually had been invoked.⁷ The Registration Convention, in a sense is about blame, by working toward an ever-greater measure of identification of space objects for purposes of liabilities and for allocating

⁷ See, e.g., CARL Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 178-80 (1982). In 1978, the Soviet nuclear-powered satellite *Cosmos 954* re-entered the atmosphere over Canada, spreading small pieces of radioactive debris over a large part of essentially uninhabited parts of the latter country. The discussions between the two states on the liability of the Soviet Union, and in particular on the extent of compensation due, resulted in a bilateral settlement whereby the Soviet Union paid three million Canadian dollars in final settlement of the claim. Some experts claim that, since the Liability Convention was not referred to in the document of final settlement, nor was a Claims Commission set up as the judicial settlement system offered by the Convention, this claim was settled outside of the Convention. Others, by contrast, pointed to the fact that not only did the Canadian claim explicitly refer to the Liability Convention, but that in addition Articles IX and XIV of the Liability Convention refer to diplomatic negotiations, which need to be unsuccessful for a year before that judicial settlement system offered by Articles XIV through XX can actually be activated, therefore concluding that the Liability Convention to that extent was applied. For both the text of the Protocol Between the Government of Canada and the Government of the Union of Soviet Socialist Republics of 2 April 1981 and the Statement of Claim by Canada, see KARL-HEINZ BÖCKSTIEGEL, ET AL., SPACE LAW – BASIC LEGAL DOCUMENTS, A.IX.2.2. See further e.g. B.A. Hurwitz, *Reflections on the Cosmos 954 Incident*, in PROCEEDINGS OF THE THIRTY-SECOND COLLOQUIUM ON THE LAW OF OUTER SPACE 350-3 (1990).

state responsibility for the violation of international legal obligations. Even the Moon Agreement, which is essentially a failure,⁸ tends to attract a lot of attention from scholars.

From that perspective, the beauty of the Rescue Agreement would, or should have been to deal to a considerable extent with astronauts, latter-day heroes exploring the outer boundaries of human existence as “envoys of mankind,”⁹ and in particular with events in which their lives would be at risk. In the limited number of cases where astronauts were in distress¹⁰ little effort was expended to “rescue” them, and certainly not by states other than those whose astronauts or cosmonauts were in danger – which is what the Rescue Agreement is largely about.

Whatever the reason, the Rescue Agreement has remained somewhat of a sleeping beauty, attracting much less attention than the other four UN-based treaties. Perhaps the Rescue Agreement’s true relevance remains hidden. In any case, with its fortieth anniversary to celebrate, it’s time to wake up and perhaps, after all, celebrate!

2. HISTORY AND BACKGROUND OF THE RESCUE AGREEMENT

The history of the Rescue Agreement started shortly after the beginning of the Space Age, when a 1959 Report of the Committee on the Peaceful Uses of Outer Space made reference

⁸ With only thirteen ratifications (none by major space-faring nations) and four signatories (including France and India, though both have for many years refrained from any visible steps to move from signature to proper ratification) as of 1 January 2008, the Moon Agreement has by a wide mark missed its ambition to establish a viable framework regime for exploitation of the moon. U.N. Office of Outer Space Affairs, U.N. Treaties & Principles on Space Law, <http://www.unoosa.org/oosa/en/SpaceLaw/treaties.html> (last visited Nov. 10, 2008). Efforts to revive it are being discussed, but might not have much chance of success if the Agreement is not to be overhauled fundamentally. See Frans G. Von der Dunk, *The Moon Agreement and the Prospect of Commercial Exploitation of Lunar Resources*, 32 ANNALS AIR & SPACE L. 91, 91-113 (2007).

⁹ Outer Space Treaty, *supra* note 3, at art. V.

¹⁰ Notable examples include *Apollo 1* (blew up on the launch pad), *Soyuz 1* (plummeted back to earth and smashed into the ground), *Apollo 13* (sustained damage during flight which almost prevented its return to earth), *Soyuz 11* (lost all oxygen on board during flight), *Challenger* and *Columbia* (both shuttles blew up, one during ascent, the other during re-entry). For a comprehensive list of space accidents, see Janes.com, A Brief History of Space Accidents, http://www.janes.com/aerospace/civil/news/jsd/jsd030203_3_n.shtml (last visited Oct. 26, 2008).

to the issues that would provide the major rationale for establishing the Rescue Agreement.¹¹ Paragraph 21 of the Report states:

Problems of re-entry and landing of space vehicles will exist both with respect to unmanned space vehicles and later with respect to manned vehicles of exploration. Recognizing that landing may occur through accident, mistake or distress, members of the committee called attention to the desirability of the conclusion of multilateral agreements concerning re-entry and landing. Among the subjects that might be covered by such agreements would be the return to the launching state of the vehicle itself and – in the case of a manned vehicle – provision for the speedy return of personnel.

Furthermore, paragraph 74 of the same Report provides:

Where space vehicles re-enter the earth's atmosphere either through design or misadventure and any equipment or instrumentation is recovered by countries other than the launching country, arrangements are needed for restoring such instrumentation and equipment to the launching country.

Thus, when in 1962 the superpowers agreed on the need to take these issues further down the road to legal codification at the international level by means of an exchange of letters, the scene was set for developing a proper regime dealing with the rescue and return of astronauts and the return of space objects.¹² For example, the ITU's 1963 Extraordinary Administrative Radio Conference, held in Geneva, adopted Resolution No. 2A, describing how to handle radio communications in the event of space vehicle distress or an emergency situation.¹³

¹¹ At its inception, COPUOS was an *ad hoc* committee within the UN. It has since become a significant permanent committee. See CHRISTOL, *supra* note 7 at 152-53; K. Hodgkins, *Procedures for Return of Space Objects Under the Agreement on the Rescue of Astronauts, the Return of Astronauts & the Return of Objects Launched into Outer Space*, in PROCEEDINGS UNITED NATIONS/INTERNATIONAL INSTITUTE OF AIR AND SPACE LAW WORKSHOP ON CAPACITY BUILDING IN SPACE LAW 59 (2003).

¹² See CHRISTOL, *supra* note 7, at 152-70. See also GYULA GÁL, SPACE LAW 211-13 (1969); MANFRED LACHS, THE LAW OF OUTER SPACE, 87-88, n.1 (1972); Hodgkins, *supra* note 11, at 59.

¹³ See LACHS, *supra* note 12 at n.40.

The negotiations undertaken in follow-up to the political US-Soviet agreement led to its first tangible results by way of one particular provision of the 1963 Declaration of Principles.¹⁴ Further to the inspiration of the UN General Assembly “by the great prospects opening up before mankind as a result of man’s entry into outer space,” the recognition of “the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes,” and the belief “that the exploration and use of outer space should be carried on for the betterment of mankind and for the benefit of States irrespective of their degree of economic or scientific development,”¹⁵ Principle 9 provides:

States shall regard astronauts as envoys of mankind in outer space, and shall render to them all possible assistance in the event of accident, distress, or emergency landing on the territory of a foreign State or on the high seas. Astronauts who make such a landing shall be safely and promptly returned to the State of registry of their space vehicle.¹⁶

The Declaration of Principles would soon come to be recognized as binding customary international law, though that question is now essentially theoretical in view of the fact that the Outer Space Treaty, whose binding character is undisputed, includes an almost identical obligation and has been ratified by all relevant space-faring nations.¹⁷ Article V of the Outer Space Treaty provides in full:

States Parties to the Treaty shall regard astronauts as envoys of mankind in outer space and shall render to them all possible assistance in the event of accident, distress, or emergency landing on the territory of another State Party or on the high

¹⁴ See Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, G.A. Res. 1962 (XVIII), para. 2, UN Doc. A/AC.105/572/Rev.1, at 37 (Dec. 13, 1963) [hereinafter Declaration of Principles].

¹⁵ Declaration of Principles, *supra* note 14, paras. 1-3.

¹⁶ *Id.* at para. 9.

¹⁷ Currently, the tally of adherence to the Outer Space Treaty stands at 98 parties and 27 signatories. See U.N. Office of Outer Space Affairs, U.N. Treaties & Principles on Space Law, <http://www.unoosa.org/oosa/en/SpaceLaw/treaties.html> (last visited Nov. 10, 2008).

seas. When astronauts make such a landing, they shall be safely and promptly returned to the State of registry of their space vehicle.

In carrying on activities in outer space and on celestial bodies, the astronauts of one State Party shall render all possible assistance to the astronauts of other States Parties.

States Parties to the Treaty shall immediately inform the other States Parties to the Treaty or the Secretary-General of the United Nations of any phenomena they discover in outer space, including the Moon and other celestial bodies, which could constitute a danger to the life or health of astronauts.

Thus, the three key elements for an international agreement on the issue of astronauts, as foreseen in the 1962 U.S.-U.S.S.R. exchange of letters, were effectively established. Under the not yet defined concept that astronauts serve as envoys of mankind in outer space, (1) astronauts in distress on earth should be assisted as much as possible, (2) astronauts in outer space should be equally assisted as much as possible,¹⁸ and (3) states are generally obligated to provide information that will aid in such assistance.

¹⁸ Although the absence of reference to “the event of accident, distress, or emergency” may shed doubts on the scope of application here, one may suggest such absence, as compared to the first paragraph of Article V, broadens the obligation to assist astronauts in outer space to any case where such an astronaut would like to be assisted, and perhaps even to any case where assistance could be rendered, whether solicited or not. This interpretation is probably too broad. Any obligation to render assistance for the sake of international cooperation only, that is without such a prerequisite being invoked, would be rather emptied of all meaning, considering other international documents clearly leave it to the discretion of individual parties to decide whether, and on what terms, they would cooperate in outer space and space activities. *See, e.g.*, Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of all States, Taking into Particular Account the Needs of Developing Countries, G.A. Res. 51/122, ¶ 2, U.N. Doc. A/RES/51/122 (Feb. 4, 1997); XXII-I ANNALS OF AIR AND SPACE L. 556 (1997); 46 ZLW 236 (1997). Additionally, any activity in outer space departing from prearranged procedures in the context of human space flight, as this is still a rather hazardous activity, brings certain risks with it – not to mention costs – which might not be justified by a request for assistance for whatever reason without a clear emergency situation arising. Furthermore, that last evaluation is to some extent confirmed by the *de facto* situation in extreme adventure sports like mountaineering, where it is principally accepted that each participant can only be legally obliged to help another in case the risk to his own life that might arise from such rescue activity is not substantial.

“Astronaut” is an English-language term synonymous with the Soviet term “cosmonaut”. The distinction, indeed, is largely a matter of words:

The term astronauts . . . literally . . . means persons who sail among the stars, and the term cosmonauts favoured by the Soviet Union those who navigate the universe. In practice, both terms are used simply to describe those who venture extra terrestrially to outer space, including the moon and other celestial bodies, whether or not beyond interplanetary space.¹⁹

This expert evaluation was confirmed by the fact that the Russian version of the Outer Space Treaty, equally authentic to the English one,²⁰ does refer to the term cosmonaut.²¹ In the remainder of this article, the term astronaut(s) will therefore be used, expressly encompassing anyone flying under the title of cosmonaut, and, given the entry of the first Chinese in outer space, taikonaut.

The second aspect of the Rescue Agreement, space objects, is also addressed in the Outer Space Treaty. Article VIII provides in relevant part: “[O]bjects or component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall be returned to that State Party, which shall, upon request, furnish identifying data prior to their return.”²² Immediately after the Outer Space Treaty’s completion, however, the United States and the Soviet Union, as well as some other member states of COPUOS, realized their interests in protecting astronauts and recovering space objects demanded

¹⁹ Bin Cheng, “Space Objects”, “Astronauts” & “Related Expressions,” PROCEEDINGS OF THE THIRTY-FOURTH COLLOQUIUM ON THE LAW OF OUTER SPACE 17, 25 (1991).

²⁰ Cf. Outer Space Treaty, *supra* note 3 at Art. XVII.

²¹ Cf. U.N. Office of Outer Space Affairs, U.N. Treaties & Principles on Space Law, <http://www.unoosa.org/oosa/en/SpaceLaw/treaties.html> (last visited Sep. 29, 2008) (offering, *inter alia*, English and Russian language versions of the treaties). See also E. Kamenetskaya, “Cosmonaut” (“Astronaut”): An Attempt of International Legal Definition, in PROCEEDINGS OF THE THIRTY-FIRST COLLOQUIUM ON THE LAW OF OUTER SPACE 177, 177-78 (1988); Vladimír Kopal, *Some Remarks on Issues Relating to Legal Definitions of “Space Object”, “Space Debris” and “Astronaut”,* in PROCEEDINGS OF THE THIRTY-SEVENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 99, 105, n. 20 (1994).

²² Outer Space Treaty, *supra* note 3, at art. VIII.

further elaboration and refinement, and took further steps to achieve them.²³ Thus, they gave birth to the Rescue Agreement.

3. THE RESCUE AGREEMENT

3.1. *General remarks*

The Rescue Agreement may have predominantly reflected the interests of the two superpowers at the time, being the only states able to bring man into space, and thus the only two concerned with the welfare of astronauts. But, by incorporating the handling of space objects upon their return to earth, it assumed the interests of a handful of other states that had already developed their own launch capabilities. At the same time, it was part of a package deal, since the establishment of the Agreement would have made much less sense if only the handful of space-faring states were to adhere to it. Adherence of a considerable number of non-space-faring nations to the Agreement would hinge upon the necessity to heed the worries of such states that other states' space objects, manned or unmanned, might upon re-entry land up on their territory, and possibly create considerable, exceptionally even catastrophic, damage. Thus, the states pushing for the Rescue Agreement also expressed their serious intention to arrive at an elaborated liability regime, resulting in the Liability Convention. Identification of relevant space objects and the states "behind" them for the purposes of such liability allocation followed shortly thereafter, by way of the Registration Convention.²⁴ Not even the Preamble of the Rescue Agreement, however - let alone the operative parts thereof - makes any reference to this. It is rather succinct, containing a mere four considerations, as compared to the Outer Space Treaty (nine), the Liability Convention (five), the Registration Convention (eight), and the Moon Agreement (seven). Its main purpose is establishing beyond any doubt the relationship between the Rescue Agreement and the relevant clauses of the Outer Space Treaty (Articles V and VIII), which it seeks to

²³ Cf. CHRISTOL, *supra* note 7, at 167-68.

²⁴ See, e.g., CHRISTOL, *supra* note 7, at 170-71.

elaborate, “develop and give further concrete expression to.”²⁵ In addition, the key concept of “international cooperation in the peaceful exploration and use of outer space” is reaffirmed, as are the specific “sentiments of humanity” that underpin the regime especially for astronauts in distress.²⁶

In line with its rapid realization and similar to the Outer Space Treaty, the Rescue Agreement carries widespread acceptance. Currently it has 90 states parties, and a further 24 states as signatories;²⁷ the signature of a treaty pending ratification by that same state, under the law of treaties, already requires the state concerned not to defeat the object and purpose of the treaty.²⁸ This constituency, moreover, encompassed almost all of the space-faring nations, whether Western, (formerly) Communist, or developing, so as to refute any claim that it serves only a distinct section of the world community when it comes to space activities, astronauts, and space objects. Furthermore, in accordance with Article 6 of the Rescue Agreement,²⁹ two intergovernmental organisations, the European Space Agency (ESA)³⁰ and the European Organization for the Exploitation of Meteor-

²⁵ Rescue Agreement, *supra* note 1, paras. 2-3.

²⁶ *Id.* at paras. 4-5.

²⁷ Status as of 1 January 2008. See U.N. Office of Outer Space Affairs, U.N. Treaties & Principles on Space Law, <http://www.unoosa.org/oosa/en/SpaceLaw/treaties.html> (last visited Nov. 10, 2008).

²⁸ See Vienna Convention on the Law of Treaties, art. 18(a), May 23, 1969, 1155 U.N.T.S. 331 (commonly recognised as customary international law also for non-party states). The relevant part reads: “A State is obliged to refrain from acts which would defeat the object and purpose of a treaty when . . . it has signed the treaty or has exchanged instruments constituting the treaty subject to ratification, acceptance or approval, until it shall have made its intention clear not to become a party to the treaty.” *Id.*

²⁹ See also *infra*, ¶ 3.2. Article 6 thus took the references in the Outer Space Treaty, including Art. VI (“When activities are carried on in outer space, including the Moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.”) and Art. XIII (applying the Treaty’s provisions “whether . . . activities are carried on by a single State Party to the Treaty or jointly with other States, including cases where they are carried on within the framework of international intergovernmental organizations.”) a fundamental step further.

³⁰ ESA was established by means of the Convention for the Establishment of a European Space Agency, May 30, 1975, 14 I.L.M. 864.

logical Satellites (EUMETSAT)³¹ have deposited Declarations indicating acceptance of the substantive rights and obligations provided by the Agreement. Thus, sleeping or not, the Rescue Agreement is second only to the Outer Space Treaty in terms of number of ratifications.³² Its originally limited relevance (in terms of number of states involved in space activities) has grown concurrently with the entry of many new states into the area of outer space, whether in manned or unmanned fashion, and therefore certainly is worthy of attention and re-examination of its main provisions.

3.2. The Rescue Agreement: definitional issues

The Rescue Agreement contains one key clause on definitions, illustrating its intent to move beyond general principles into the realm of clear-cut legal obligations. Article 6 reads in full:

For the purposes of this Agreement, the term “launching authority” shall refer to the State responsible for launching, or, where an international intergovernmental organization is responsible for launching, that organization, provided that that organization declares its acceptance of the rights and obligations provided for in this Agreement and a majority of the States members of that organization are Contracting Parties to this Agreement and to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

This definition of “launching authority,” through the inclusion of intergovernmental organizations, is broader than the concept of the “launching State” which rules the application of both the

³¹ EUMETSAT was established by means of the Convention for the Establishment of a European Organisation for the Exploitation of Meteorological Satellites “EUMETSAT”, (1983) 1990 U.K.T.S. 32. See also BÖCKSTEGEL, *supra* note 7, at C.III.1.

³² Compare *supra* text accompanying note 29, with Liability Convention (86 ratifications, 24 signatures and 3 declarations), and Registration Convention, (51 ratifications, 4 signatures and 2 declarations). U.N. Office of Outer Space Affairs, U.N. Treaties & Principles on Space Law, <http://www.unoosa.org/oosa/en/SpaceLaw/treaties.html> (last visited Nov. 10, 2008).

Liability Convention and the Registration Convention.³³ However, that difference in scope is largely negated by the possibility for intergovernmental organizations to be equated to states under their respective regimes.³⁴ In this respect, the Rescue Agreement was the first of its kind, not only in space law, but also from a broader perspective.³⁵ Opening up partisanship to treaties to an intergovernmental organisation on a formal (and more or less equal) level indeed remained confined initially to the space arena. Outside of space law, only the advent of the European Union in the last decade of the twentieth century as a supranational power³⁶ caused partisanship of the individual EU member states to certain treaties to be partly emptied of meaning.³⁷ This unique trait of space law testified to the special role intergovernmental organisations were destined to play in the human adventure in outer space.

In hindsight, the Rescue Agreement should have contained at least two other crucial definitions: “personnel of a spacecraft” and “space object”. The Rescue Agreement, when referring to “personnel of a spacecraft,” avoids the term “astronauts” (or “cosmonauts” for that matter) as used in Article V of the Outer Space Treaty. However, the full title of the Rescue Agreement

³³ Both conventions contain identical definitions of the concept of “launching State.” Liability Convention, *supra* note 4, at art. I(c), and Registration Convention, *supra* note 5, at art. I(b). However, when the “launching authority” requests the return of its astronaut, under the Outer Space Treaty, such return is due rather to the state of registry. See LACHS, *supra* note 12, at 85-86.

³⁴ Cf. Liability Convention, *supra* note 4, at art. XXII, with Registration Convention, *supra* note 5, at art. VII.

³⁵ After the Rescue Agreement, apart from the Liability Convention and the Registration Convention, the Moon Agreement (by means of Art. 16) would come to offer similar opportunities to intergovernmental organizations to become “parties” to the respective treaties for all practical purposes. See GÁL, *supra* note 12, at 219; CHRISTOL, *supra* note 7, at 200-02.

³⁶ The European Union as such came into existence in 1993, transforming the old European Economic Community into the European Community as well as establishing the broader European Union-construct. Treaty on European Union, Feb. 7, 1992, 31 I.L.M. 247. This represented a cornerstone of finalising the European Community’s Internal Market, resulting in a considerable transfer of competency in international trade issues to the EU level.

³⁷ Under the treaties developed within the framework of the World Trade Organisation, international trade policies having been partially moved from the level of the individual member states to the EU-level. See, e.g., General Agreement on Trade in Services, Apr. 15, 1994, 1869 U.N.T.S. 183.

and its Preamble refer to “astronauts” as this term was used in the Outer Space Treaty. Thus, arguments sometimes heard on whether the two terms are identical or not, are largely semantic in nature.³⁸ The change in terminology may perhaps have had to do with a desire to express more clearly what categories of man would be concerned, but does so essentially by equating the newer term to the older one.³⁹ And while “space objects” is also undefined by the Rescue Agreement, the Liability Convention and the Registration Convention provide at least a partial definition as including “component parts of a space object as well as its launch vehicle and parts thereof.”⁴⁰ For practical purposes, this definition – as later refined by various authors equating a space object to any man-made object launched into outer space, or alternatively into a space orbit – applies also to the concept of “space object” as it is used in the Rescue Agreement.⁴¹

3.3. *The Rescue Agreement and astronauts*

Articles 1 through 4 of the Agreement, in other words the bulk of its substantive operative provisions, are dedicated to the obligations of states to assist personnel of a spacecraft in relevant cases. The first thing to be noted here is that the reference to assistance by astronauts of one state to astronauts of other states in outer space under the second paragraph of Article V of the Outer Space Treaty does not reappear in the Rescue Agree-

³⁸ See Rescue Agreement, *supra* note 1, at para.1, ¶1. See also Ryszard Hara, *Legal Status of Astronauts and Other Personnel on the Moon*, in PROCEEDINGS OF THE TWENTY-SIXTH COLLOQUIUM ON THE LAW OF OUTER SPACE 165 (1983); Stephen Gorove, *Major Definitional Issues in the Space Agreements*, in PROCEEDINGS OF THE THIRTY-FIFTH COLLOQUIUM ON THE LAW OF OUTER SPACE 76, 77-78, n.15 (1992); Kopal, *supra* note 21, at 105-06.

³⁹ See, e.g., LACHS, *supra* note 12, at 79, 88-89, at n.4; cf. Kopal, *supra* note 21, at 105.

⁴⁰ Liability Convention, *supra* note 4, at art. I(d); Registration Convention, *supra* note 5, at art. I(b). See also Gorove, *supra* note 38, at 76-77.

⁴¹ See, e.g., Stephen Gorove, *Definitional Issues Pertaining to “Space Object,”* in PROCEEDINGS OF THE THIRTY-SEVENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 87, at 88, 90-91 (1994). See also Kopal, *supra* note 21, at 101; GÁL, *supra* note 12, at 207-09; Gyula Gal, *Space Objects – “While in Outer Space,”* in PROCEEDINGS OF THE THIRTY-SEVENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 84, at 85 (1994).

ment. Articles 1 through 4 of the Rescue Agreement exclusively concern *terrestrial* events.⁴²

Upon closer inspection, we can further subdivide the terrestrial areas described in these articles. Where Articles 1 and 4 impose obligations of global scope on signatories, Articles 2 and 3 impose obligations on signatories that are limited by geographical area, and mutually exclusive in their application. Specifically, Article 1 obligates any state who becomes aware that personnel of a spacecraft have suffered serious difficulties⁴³ to notify the launching authority and the UN Secretary General⁴⁴. Similarly, Article 4 obligates any state that recovers an astronaut to return them “safely and promptly” to the launching authority. On the other hand, Article 2 focuses on events occurring within the national territory of a given state⁴⁵, and thus the evident territorial sovereignty of that state determines the relevant obligations.⁴⁶ That sovereignty *both* means that the Agreement can call upon it to “immediately take all possible steps” for the purpose of the astronaut’s rescue and “render them all necessary assistance” as it (normally) has full powers to do so, *and* that it has to recognise the ultimate control of that state over the conduct of any relevant operations *vis-à-vis* the launching authority. In contrast, Article 3 deals with events occurring “on the high seas or in any place not under the jurisdiction” of a given state, where the resulting obligations are not derived from territorial sovereignty. As a consequence of the absence of territorial sovereignty and the accompanying *de facto* possibilities for a state to do that, the obligation is phrased here much more conditionally – it applies only to states “in a position to do so” and then only “if necessary.”⁴⁷ An illustrative example here would be the scenario where a number of states might be in a

⁴² See Rescue Agreement, *supra* note 1.

⁴³ Art. 1 of the Rescue Agreement refers to an “accident,” “conditions of distress,” and an “emergency or unintended landing” in this context. See *id.* at art. 1.

⁴⁴ See *id.* at art. 1(a)-(b).

⁴⁵ Art. 2 of the Rescue Agreement uses “territory under the jurisdiction of a Contracting Party” for this purpose. See *id.* at art. 2.

⁴⁶ See LACHS, *supra* note 12, at 80-81; CHRISTOL, *supra* note 7, at 174-75, 185-88; GÁL, *supra* note 12, at 223-34.

⁴⁷ See, e.g., LACHS, *supra* note 12, at 81-82; CHRISTOL, *supra* note 7, at 174-75, 189-92; GÁL, *supra* note 12, at 224.

position to come to the rescue but where, if all would actually do so, they would be more likely to compound the rescue operation than benefit it. Moreover, while in the context of Article 2 it is more or less taken for granted that the “rescuing” state is aware of the event as it takes place on its own territory, under Article 3 the obligation is explicitly made contingent upon the awareness of the “rescuing” state.

3.4. *The Rescue Agreement and space objects*

In the Rescue Agreement, only Article 5 deals with the issue of space objects that have suffered an unfortunate and unintended accident, and as a consequence have landed, either in whole or in parts, somewhere on earth. Article 5 still makes the same distinction as Articles 1 through 4 regarding categories of terrestrial areas.⁴⁸ The obligation to notify the launching authority as well as the UN Secretary-General applies regardless of where the space object or component parts thereof have landed, as long as the state concerned has become aware thereof.⁴⁹ But, the obligation of recovery only applies where it concerns national territory – and then only upon the request of the launching authority and with its assistance – whilst its sovereign discretion to act furthermore finds its expression in the phrase that action is only obliged “as it finds practicable.”⁵⁰ A further obligation concerns the return to the launching authority of “objects launched into outer space.” Though this represents a slight, formal deviation from the terminology employed elsewhere in the Agreement, it should not be paid too much attention. Rather, it should for all purposes be equated to “space objects.”⁵¹ This obligation pertains regardless of whether the object concerned turned up specifically within the territory of the ‘recovering state’ or merely anywhere outside the launching authority’s territory. Paragraph 4 touches upon a somewhat different issue:

⁴⁸ Rescue Agreement, *supra* note 1, *See also* LACHS, *supra* note 12, at 82-83; CHRISTOL, *supra* note 7, at 176-78; 196-97.

⁴⁹ *See* Rescue Agreement, *supra* note 1, at art. 5(1),

⁵⁰ Here again, the reference is to territory under the jurisdiction of the “recovering state”. *Id.* at art. 5(2).

⁵¹ *Id.* at art. 5(3). *See also* LACHS, *supra* note 12, at 79, 82-85.

imposing an obligation upon the launching authority to effectively mitigate “possible danger of harm” in the event a recovered space object is “of a hazardous or deleterious nature.” Paragraph 5 finally provides for the obligation of the launching authority to bear the costs for recovery and return operations of a space object, the most surprising aspect here being perhaps that such a clause is missing in Articles 1 through 4 as dealing with the rescue and return of personnel of a spacecraft.⁵²

4. IMPLEMENTATION OF THE RESCUE AGREEMENT

The relevance of any international treaty is not only measured by the rationality, coherence and scope of its terms, but by the extent to which it is actually implemented. Implementation in the context of international treaties refers to both implementation in law, that is by national states in their domestic jurisdictions, and implementation in fact, that is being invoked with respect to actual events, situations or disputes.

As to implementation in law, the Rescue Agreement has remained a sleeping beauty, which is not surprising given its subject matter. The rights and obligations are not only *de lege* addressed to states, but *de facto* only concern states. When the Rescue Agreement was drafted, foreseeable rescue, recovery and return operations were expected to be undertaken almost exclusively by state-actors. Mirror-wise, state actors were almost exclusively the parties conducting the activities that might give rise to such rescue, recovery, and return operations by other states. Thus, there was little sense in addressing the (then) small role of private companies and individuals by means of na-

⁵² The closest these Articles come to such an obligation, is the clause stating that “[i]f assistance by the launching authority *would help* to effect a prompt rescue or *would contribute substantially* to the effectiveness of search and rescue operations”, where it could of course be argued that payment by the launching authority of relevant expenses *would help* and contribute substantially to achieve the main aims of those Articles and indeed the Rescue Agreement as a whole. Rescue Agreement, *supra* note 1, at art. 2 (emphasis added). Generally, authors seem to dismiss such an obligation explicitly or implicitly by stressing strongly the obligation to take care of the astronauts. *See, e.g.*, LACHS, *supra* note 12, at 85; GÁL, *supra* note 12, at 224. However, others note a U.S. proposal of 1962, which did include expenses incurred for assistance to and/or return of personnel of spacecraft. *E.g.*, CHRISTOL, *supra* note 7, at 157, 200.

tional space law beyond general existing duties of assistance to others in danger, or even to specify the particular application of any 'Good Samaritan' doctrine to such rare occasions.

Implementation in fact harks back to the international level. Invocations of the Rescue Agreements have been relatively infrequent, and so far have not concerned the category of astronauts in distress. There was one case of relevance occurring prior to the establishment of the Rescue Agreement and even the Outer Space Treaty, when a component part of a Soviet *Sputnik 4* having landed in Wisconsin in the United States in September 1962 was returned to the Soviet embassy in May 1963.⁵³ Another interesting case occurred where the launching authority could not be identified, and consequently only the UN Secretary-General was notified:

By a letter of 16 July 1968 the Deputy Prime Minister of Nepal informed the Secretary-General that "certain metallic pieces were discovered in Nepalese territory" and that they were believed to be parts of a space object, but that the Government of Nepal had been unable to identify the launching authority. Though the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space had, at the time, not yet come into force, the Government of Nepal, acting "in the spirit" of that Agreement had "decided to open them for examination by interested States and return them to the launching authority on receipt of identifying data."⁵⁴

Even recently however there have been some interesting cases to be shown to the Agreement's credit. US representative Ken Hodgkins, in his contribution to the first-ever UN Workshop in space law capacity building in 2002, lists four of those.⁵⁵

⁵³ See GAL, *supra* note 12, at 216.

⁵⁴ LACHS, *supra* note 12, at 91-92 & n.20 (quoting, *inter alia*, from a UN press release of Jul. 17, 1968).

⁵⁵ See Hodgkins, *supra* note 11, at 61-66.

4.1. Japan and a US space object (1999-2000)

When Japan discovered component parts of a space object on Yoron Island, it rapidly came to the conclusion that these were remainders of a *Pegasus* first stage launch vehicle, used for a launch in April 1993. It then sent a *note verbale* to the UN Secretary General on 20 January 2000, with the following text:

In accordance with article 5, paragraph 1 of the 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, the Permanent Representative of Japan hereby wishes to notify the Secretary-General that component parts of a space object have been discovered on Japanese territory. The object was found on the beach on Yoron Island in the Kagoshima Prefecture by inhabitants of the island on 8 November 1999. It is a cylinder-shaped object, which is 6m in length and 1.25m in diameter. It is believed to be a component part of a United States launch vehicle. An investigation concluded that the object poses no risk of hazards to people and property, and it is temporarily being kept at the village office on the island. At present, and in cooperation with the Government of the United States, efforts to identify the object are underway. In accordance with article 5(1) of the 1968 Agreement cited above, the Government of Japan is also notifying the Government of the United States. The Permanent Mission of Japan further has the honour to request that this communication be circulated to Member States as an official document of the United Nations Committee on the Peaceful Uses of Outer Space.⁵⁶

In other words, following the provisions of Article 5(1) of the Rescue Agreement as well as explicitly referring to them, Japan notified the UN Secretary-General as well as the perceived launching authority, the United States, while awaiting definite identification. Furthermore, with a view to Article 5(4) Japan checked whether the objects might be “of a hazardous or deleterious nature,” the result of that check being negative, and in conformity with Article 5(2) recovered said objects, albeit without “the request of the launching authority” to do so, which that

⁵⁶ See *id.* at 62.

paragraph formally required. Furthermore, Japan temporarily stored the objects awaiting US action under Article 5(3), such as a formal request to return them upon final identification.

4.2. The United States and a French space object (2000)

Following discovery and identification of an object on a Texas beach, the United States on 13 March 2000 gave notice, as follows, to the UN Secretary-General:

[I]n accordance with article 5, paragraph 1, of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Space Objects Launched into Outer Space (the 'Agreement'), that component parts of a space object have been discovered on territory of the United States of America. The object found had washed ashore near Corpus Christi, Texas, and appears to be part of the nose cone of a French Ariane rocket. It bears the following identifying lettering on a circular plate at the interior apex of the cone: "AEROSPATIALE, IE/AX, FLUXMETRE NO. SER.966-332, REF. DE DEF. A5-IK871-A-000 BLOCK CONTROLE: 25-11.96". An investigation concluded that the object poses no hazard to people and property. It is being held temporarily by local authorities in Corpus Christi.

... In accordance with article 5 of the Agreement, the Government of the United States of America has also notified the Government of France and invited it to identify the object.⁵⁷

Furthermore, as did the Japanese government in the previous case, the United States of America requested "that this communication be circulated to Member States as an official document of the Committee on the Peaceful Uses of Outer Space." Once more, the essential elements of Article 5 were duly respected: notification of the UN Secretary-General and the launching authority, in this case France; inviting it in the process to identify the space object, although the detailed description on the nose cone as quoted leaves little doubt that the provisional identification by the United States could hardly be faulted; and an inves-

⁵⁷ See *id.* at 63.

tigation for potential hazardous or deleterious substances revealed no such risks. Furthermore, as Hodgkins added in his presentation at the 2002 UN Workshop, the cone was turned over to the French authorities, which furthermore honoured their obligation under Article 5(5) to cover expenses incurred by the US authorities to such an extent as to include reimbursement of the 100 dollars (U.S.) which a US policeman apparently had to pay to the farmer who actually found it and did not want to let go of it too easily.

4.3. South Africa and a US space object (2000)

A few months after several objects had been found in a remote part of the country, on 3 July 2000 the government of South Africa took the steps it was supposed to take under the Rescue Agreement. Explicitly referring to Article 5(1) of the Rescue Agreement, South Africa notified the UN Secretary-General:

[T]hat three space objects have been discovered on South African territory. The objects were found in Durbanville, Worcester and Robertson, respectively, in the Western Cape Province of South Africa, on 27 April 2000 . . .

The first object is a cylindrical steel vessel 2.7 metres long and 1.5 metres in diameter weighing 260 kilograms. The second object is a spherical metal object 60 centimetres in diameter and weighs approximately 33 kilograms. The third is a tapered, cylindrical and pipe-like object made from non-metallic, probably composite materials. It is approximately 60 centimetres long, 30 centimetres in diameter at “base” and 20 centimetres at “apex” and weighs approximately 30 kilograms. Preliminary investigations, in conjunction with Nicholas L. Johnston, Chief Scientist and Program Manager of the Orbital Debris Program Office at the Johnson Space Center of the National Aeronautics and Space Administration of the United States of America, revealed that the objects were believed to be component parts of a DELTA II second stage rocket used to launch a United States Global Positioning System (GPS) satellite on 28 March 1996. An investigation concluded that the objects posed no risk

of hazards to people and property, and were being kept by the South African Astronomical Observatory in Cape Town.⁵⁸

Once more the relevant authorities made sure there was no risk or hazard emanating from the found objects. Both the UN Secretary-General and the launching authority were duly informed of the discovery and the latter was included in the process of identification. Ken Hodgkins, in presenting this case to the UN Workshop on space law capacity building, added that the United States, in honouring its obligations under Article 5(5), also reimbursed the local community where the objects were found, which had built a small museum around them, for the damages incurred by their removal, since the largest object would not fit through the museum door and the adjacent walls had to be taken down in part as a consequence.

4.4. Saudi Arabia and a US space object (2001)

As a final example, by way of *note verbale* of 8 March 2001, Saudi Arabia informed the UN Secretary-General:

[T]hat a piece of space debris was discovered on 12 January 2001 on the territory of Saudi Arabia, at a location about 240 kilometres (km) west of Riyadh, the Saudi Arabian capital, about 1 km from the highway linking the capital with the city of Taef. [Saudi Arabia] wishes to report the following: (a) The object is a metallic cylinder, 140 centimetres (cm) long, 120 cm in diameter and weighing about 70 kilograms. Technical examination carried out by the Space Research Institute at King Abdulaziz City for Science and Technology using space debris monitoring programmes suggested that the object was the titanium cover of a solid-fuel motor used on board a GPS2 satellite, launched in 1993, which had been expected to fall in northern Brazil. Thiokol, the American manufacturer of this type of motor, was contacted and provided with the serial number on the object. Thiokol confirmed that the debris was in fact the cover of a Star 48-type motor used on board a GPS2 satellite launched in 1993; (b) The Government of Saudi Arabia will notify the Government of the United States of America

⁵⁸ See *id.* at 64-65.

in this regard, in compliance with article 5, paragraph 1, of the Rescue Agreement.⁵⁹

The most interesting point of this example is that Saudi Arabia, in spite of its reference to the Rescue Agreement, and specifically Article 5, was not a party to the Rescue Agreement itself – a situation that persists to this day. Hodgkins, consequently, concluded that the legal basis for this action on the part of the Saudi government could only be Article VIII of the Outer Space Treaty – to which Saudi Arabia was, and still is, a party.⁶⁰

5. LATEST DEVELOPMENTS: SPACE TOURISM AND THE RESCUE AGREEMENT

The previous examples of the Rescue Agreement's implementation within a short period of time illustrate the Agreement is more relevant than is sometimes thought. The question is then: will it remain relevant or is its relevance threatened, precisely now that upon closer view it does not seem to be as much asleep as perceived by many? Some, after all, might actually consider it a rude awakening, now that the last years humans in outer space have returned as an issue for the Rescue Agreement, as this did not concern in any meaningful sense of the word the "envoys of mankind" that Article V of the Outer Space Treaty was contemplating, or even, perhaps, "astronauts" as they were enjoying special legal attention, even treatment, under the Rescue Agreement.

'Space tourism' is a term to be used with caution, however.⁶¹ It has been defined as "any commercial activity offering customers direct or indirect experience with space travel."⁶² More generally, the 'official' definition of tourism was offered at the 1991 UNWTO Ottawa Conference on Travel and Tourism Statistics, as follows: "[t]he activities of persons travelling to and staying

⁵⁹ See *id.* at 66.

⁶⁰ *Id.* at 61.

⁶¹ See, e.g., Frans G. von der Dunk, *Passing the Buck to Rogers: International Liability Issues in Private Spaceflight*, 86 NEB. L. REV. 400, 402-03 (2007).

⁶² Stephen Hobe & Jürgen Cloppenburg, *Towards a New Aerospace Convention? – Selected Legal Issues of "Space Tourism,"* in PROCEEDINGS OF THE FORTY-SEVENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 377, 377 (2005).

in places outside their usual environment for not more than one consecutive year for leisure.”⁶³ The problem with ‘space tourism’ is that it essentially refers to the reason for private individuals to undertake activities, which is not altogether a legally decisive criterion. The term ‘private spaceflight’ is more precise and more helpful for the purpose of legal analysis. It is the level of private participation in these new types of space activities that requires analysis and – likely – adaptation of the current legal environment for undertaking space activities, whether national or international. This, however, is essentially important when looking further into the future. For example, defining private spaceflight will be critical when taking on the legal problems arising from Virgin Galactic’s proposed plans to provide sub-orbital point-to-point transportation. In any event, a real-life “space tourist” was the impetus for such discussion. In 2001, Dennis Tito went to the *International Space Station* for a week’s stay to fulfil his lifelong dream. The discussion about his presence on the Russian module, largely against the wishes of the other *ISS*-participants, quickly led to the formal establishment of a category of space traveller different from that of a professional astronaut – that of the “spaceflight participant.” A 2002 special agreement on Principles Regarding Processes and Criteria for Selection, Assignment, Training and Certification of *ISS* (Expedition and Visiting) Crewmembers amongst the parties to the intergovernmental agreement underpinning the *International Space Station (ISS)*⁶⁴ defined “spaceflight participants” as

⁶³ WORLD TOURISM ORGANIZATION, TECHNICAL MANUAL NO. 2 - COLLECTION OF TOURISM EXPENDITURE STATISTICS (1995), available at <http://pub.unwto.org:81/WebRoot/Store/Shops/Infoshop/Products/1034/1034-1.pdf>. Actually, the definition adds “business, and other purposes” after “for leisure,” but this is a strange, complicating and counter-intuitive addition ultimately to be rejected since it would effectively equate ‘tourism’ with *all* travel, which takes away any distinctive common-sense meaning of the former phrase. See also Roger D. Launius & Dennis R. Jenkins, *Is it Finally Time for Space Tourism?*, 4 *ASTROPOLITICS* 253, 255 (2006) (an extended historical expose, describing tourism as travel for purposes that everyone would agree constitutes tourism, and not *all* travel).

⁶⁴ Agreement Among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America Concerning Cooperation on the Civil International Space Station, Jan. 29, 1998, State Dep’t No. 01-52, 2001

“individuals . . . sponsored by one or more partner(s),” and explicitly included tourists, thereby allowing them on board the *ISS* in conformity with the aforementioned agreement.⁶⁵ It was under this regime that the second and further space tourists would visit the *ISS*.

This distinction between professional astronauts and space-flight participants, even if formally applicable only in the *ISS*-context, may turn out to be trendsetting, if not an industry standard. The *ISS* is currently the most complicated space endeavour in international, operational, technical, and legal terms, and the only likely space tourism destination for the forthcoming years.⁶⁶ In addition, it combines most of the first-rank space powers.⁶⁷ This means that the legal arrangements for the *ISS* stand a good chance of being the point of departure for developing relevant international law ultimately applicable to the whole world.

Does the Rescue Agreement continue to apply to all space travellers, regardless of their status? Should it apply to space-flight participants without further ado, or does it require authoritative re-interpretation? If neither, then what other inter-

WL 679938 (entered into force Mar. 27, 2001). *See also* BÖCKSTIEGEL, *supra* note 7, at D.II.4.

⁶⁵ *See* R.P. Veldhuyzen & T.L. Masson-Zwaan, *ESA Policy and Impending Legal Framework for Commercial Utilisation of the European Columbus Laboratory Module of the ISS*, in *THE INTERNATIONAL SPACE STATION – COMMERCIAL UTILISATION FROM A EUROPEAN LEGAL PERSPECTIVE* 47, 55 (F.G. von der Dunk & M.M.T.A. Brus eds., 2006) (explaining that a spaceflight participant is “an individual (e.g. . . . crewmembers of non-partner space agencies, engineers, scientists, teachers, journalists, filmmakers or tourists), sponsored by one or more partner(s); normally this is a temporary assignment that is covered under a short-term contract; they are eligible for assignment as visiting scientist, commercial user or tourist, but their task assignment cannot include ISS assembly, operations and maintenance activities.”). *See also* Leslie Jane Smith & Kay-Uwe Hörll, *Legal Parameters of Space Tourism*, in *PROCEEDINGS OF THE FOURTY-SIXTH COLLOQUIUM ON THE LAW OF OUTER SPACE* 37, 39 & 46 n.24 (2004) (making reference to Article III of the Principles Regarding Processes and Criteria for Selection, Assignment, Training and Certification of ISS (Expedition and Visiting) Crewmembers).

⁶⁶ Of course, we may soon see Virgin Galactic fully operational with its SpaceShipTwo vehicle, but this will concern a brief dip into the edge of outer space and back, in total taking no more than a few hours – and so will other, similar plans. The plans by Bigelow Aerospace, foreseeing an actual orbital hotel, are well on track so far, but even the current planning is to have such a hotel in operation not before 2015 – and such timelines turn out to be too optimistic much more often than too pessimistic.

⁶⁷ Only China and India qualify as first-rank “space powers” *not* on board.

national instrument (such as a Protocol to the Rescue Agreement or a stand-alone agreement) would be desirable or necessary to protect the newest category of human space travellers? This is not the place to discuss such issues at length. General humanitarian obligations to assist humans in distress, as is the case in the high mountains or on the high seas, may well be considered to cover what it is necessary and justified for space-flight participants without resort to the ‘entitlements’ of the Rescue Agreement or the qualification as “envoys of mankind” found in Article V of the Outer Space Treaty.⁶⁸ But whether the beauty (to the extent that she was ever sleeping in the first place) merely requires a facelift or a rival younger sister to take over some of her tasks and duties, is the subject of another debate. For better or worse, the space tourist prince has awakened the princess – and being awake is the first requirement for celebration. Happy Birthday to you!

⁶⁸ Cf. GÁL, *supra* note 12, at 224; LACHS, *supra* note 12, at 79, 81; CHRISTOL, *supra* note 7, at 153, 155-56, 159.

LOIS
LOI no 2008-518 du 3 juin 2008
relative aux opérations spatiales (1)¹

NOR : ESRX0700048L

L'Assemblée nationale et le Sénat ont adopté,
Le Président de la République promulgue la loi dont la teneur suit :

TITRE I^{er}

DÉFINITIONS

Article 1^{er}

Pour l'application de la présente loi, on entend par :

1° « Dommage » : toute atteinte aux personnes, aux biens, et notamment à la santé publique ou à l'environnement directement causée par un objet spatial dans le cadre d'une opération spatiale, à l'exclusion des conséquences de l'utilisation du signal émis par cet objet pour les utilisateurs ;

2° « Opérateur spatial », ci-après dénommé « opérateur » : toute personne physique ou morale qui conduit, sous sa responsabilité et de façon indépendante, une opération spatiale ;

3° « Opération spatiale » : toute activité consistant à lancer ou tenter de lancer un objet dans l'espace extraatmosphérique ou à assurer la maîtrise d'un objet spatial pendant son séjour dans l'espace extra-atmosphérique, y compris la Lune et les autres corps célestes, ainsi que, le cas échéant, lors de son retour sur Terre ;

4° « Phase de lancement » : la période de temps qui, dans le cadre d'une opération spatiale, débute à l'instant où les opérations de lancement deviennent irréversibles et qui, sous réserve des dispositions contenues, le cas échéant, dans l'autorisation délivrée en application de la présente loi, s'achève à la sépara-

¹ This Law is unofficially translated in this issue of the JOURNAL OF SPACE LAW on page 453.

tion du lanceur et de l'objet destiné à être placé dans l'espace extra-atmosphérique ;

5° « Phase de maîtrise » : la période de temps qui, dans le cadre d'une opération spatiale, débute à la séparation du lanceur et de l'objet destiné à être placé dans l'espace extra-atmosphérique et qui s'achève à la survenance du premier des événements suivants :

- lorsque les dernières manoeuvres de désorbitation et les activités de passivation ont été effectuées ;
- lorsque l'opérateur a perdu le contrôle de l'objet spatial ;
- le retour sur Terre ou la désintégration complète dans l'atmosphère de l'objet spatial ;

6° « Tiers à une opération spatiale » : toute personne physique ou morale autre que celles participant à l'opération spatiale ou à la production du ou des objets spatiaux dont cette opération consiste à assurer le lancement ou la maîtrise. Notamment, ne sont pas regardés comme des tiers l'opérateur spatial, ses co-contractants, ses sous-traitants et ses clients, ainsi que les co-contractants et sous-traitants de ses clients ;

7° « Exploitant primaire de données d'origine spatiale » : toute personne physique ou morale qui assure la programmation d'un système satellitaire d'observation de la Terre ou la réception, depuis l'espace, de données d'observation de la Terre.

TITRE II

AUTORISATION DES OPÉRATIONS SPATIALES

I^{er}

CHAPITRE

Opérations soumises à autorisation

Article 2

Doit préalablement obtenir une autorisation délivrée par l'autorité administrative :

1° Tout opérateur, quelle que soit sa nationalité, qui entend procéder au lancement d'un objet spatial à partir du territoire

national, de moyens ou d'installations placés sous juridiction française ou qui entend procéder au retour d'un tel objet sur le territoire national, sur des moyens ou des installations placés sous juridiction française ;

2° Tout opérateur français qui entend procéder au lancement d'un objet spatial à partir du territoire d'un Etat étranger, de moyens ou d'installations placés sous la juridiction d'un Etat étranger ou d'un espace non soumis à la souveraineté d'un Etat ou qui entend procéder au retour d'un tel objet sur le territoire d'un Etat étranger, sur des moyens ou des installations placés sous la juridiction d'un Etat étranger ou sur un espace non soumis à la souveraineté d'un Etat ;

3° Toute personne physique possédant la nationalité française ou personne morale ayant son siège en France, qu'elle soit ou non opérateur, qui entend faire procéder au lancement d'un objet spatial ou tout opérateur français qui entend assurer la maîtrise d'un tel objet pendant son séjour dans l'espace extra-atmosphérique.

Article 3

Le transfert à un tiers de la maîtrise d'un objet spatial ayant fait l'objet d'une autorisation au titre de la présente loi est soumis à l'autorisation préalable de l'autorité administrative.

Conformément aux dispositions du 3o de l'article 2, tout opérateur français qui entend prendre la maîtrise d'un objet spatial dont le lancement ou la maîtrise n'a pas été autorisé au titre de la présente loi doit obtenir à cette fin une autorisation préalable délivrée par l'autorité administrative.

Les modalités d'application du présent article sont fixées par décret en Conseil d'Etat.

CHAPITRE II

Conditions de délivrance des autorisations

Article 4

Les autorisations de lancement, de maîtrise et de transfert de la maîtrise d'un objet spatial lancé et de retour sur Terre sont délivrées après vérification, par l'autorité administrative,

des garanties morales, financières et professionnelles du demandeur et, le cas échéant, de ses actionnaires, et de la conformité des systèmes et procédures qu'il entend mettre en oeuvre avec la réglementation technique édictée, notamment dans l'intérêt de la sécurité des personnes et des biens et de la protection de la santé publique et de l'environnement.

Les autorisations ne peuvent être accordées lorsque les opérations en vue desquelles elles sont sollicitées sont, eu égard notamment aux systèmes dont la mise en oeuvre est envisagée, de nature à compromettre les intérêts de la défense nationale ou le respect par la France de ses engagements internationaux.

Des licences attestant, pour une durée déterminée, qu'un opérateur spatial justifie des garanties morales, financières et professionnelles peuvent être délivrées par l'autorité administrative compétente en matière d'autorisations. Ces licences peuvent également attester la conformité des systèmes et procédures mentionnés au premier alinéa avec la réglementation technique édictée. Elles peuvent enfin valoir autorisation pour certaines opérations.

Un décret en Conseil d'Etat fixe les conditions d'application du présent article. Il précise notamment :

1° Les renseignements et documents à fournir à l'appui des demandes d'autorisation et la procédure de délivrance de ces autorisations ;

2° L'autorité administrative compétente pour délivrer les autorisations et pour édicter la réglementation technique mentionnée au premier alinéa ;

3° Les conditions dans lesquelles peuvent être délivrées les licences mentionnées au troisième alinéa ainsi que les modalités selon lesquelles le bénéficiaire d'une licence informe l'autorité administrative des opérations spatiales auxquelles il procède ;

4° Les conditions dans lesquelles l'autorité administrative peut dispenser le demandeur de tout ou partie du contrôle de conformité prévu au premier alinéa, lorsqu'une autorisation est sollicitée en vue d'une opération devant être conduite à partir du territoire d'un Etat étranger ou de moyens et d'installations placés sous la juridiction d'un Etat étranger et que les engage-

ments nationaux ou internationaux, la législation et la pratique de cet Etat comportent des garanties suffisantes en matière de sécurité des personnes et des biens, de protection de la santé publique et de l'environnement, et de responsabilité.

CHAPITRE III

Obligations des titulaires d'autorisation

Article 5

Les autorisations délivrées en application de la présente loi peuvent être assorties de prescriptions édictées dans l'intérêt de la sécurité des personnes et des biens et de la protection de la santé publique et de l'environnement, notamment en vue de limiter les risques liés aux débris spatiaux.

Ces prescriptions peuvent également avoir pour objet de protéger les intérêts de la défense nationale ou d'assurer le respect par la France de ses engagements internationaux.

Article 6

I. – Tout opérateur soumis à autorisation en application de la présente loi est tenu, tant que sa responsabilité est susceptible d'être engagée dans les conditions prévues à l'article 13 et à concurrence du montant mentionné aux articles 16 et 17, d'être couvert par une assurance ou de disposer d'une autre garantie financière agréée par l'autorité compétente.

Un décret en Conseil d'Etat précise les modalités d'assurance, la nature des garanties financières pouvant être agréées par l'autorité compétente et les conditions dans lesquelles il est justifié du respect des obligations mentionnées au premier alinéa auprès de l'autorité qui a délivré l'autorisation. Il précise en outre les conditions dans lesquelles l'opérateur peut être dispensé par l'autorité administrative de l'obligation prévue à l'alinéa précédent.

II. – L'assurance ou la garantie financière doit couvrir le risque d'avoir à indemniser, dans la limite du montant mentionné au I, les dommages susceptibles d'être causés aux tiers à l'opération spatiale.

III. – L'assurance ou la garantie financière doit bénéficier, dans la mesure de la responsabilité pouvant leur incomber à raison d'un dommage causé par un objet spatial, aux personnes suivantes :

- 1° L'Etat et ses établissements publics ;
- 2° L'Agence spatiale européenne et ses Etats membres ;
- 3° L'opérateur et les personnes qui ont participé à la production de l'objet spatial ou à l'opération spatiale.

Article 7

I. – Sont habilités à procéder aux contrôles nécessaires en vue de vérifier le respect des obligations du présent chapitre :

1° Les agents commissionnés par l'autorité administrative mentionnée à l'article 2, dans des conditions déterminées par décret en Conseil d'Etat, appartenant aux services de l'Etat chargés de l'espace, de la défense, de la recherche, de l'environnement ou à ses établissements publics qui exercent leurs missions dans les mêmes domaines ;

2° Les agents habilités à effectuer des contrôles techniques à bord des aéronefs ;

3° Les membres du corps de contrôle des assurances mentionné à l'article L. 310-13 du code des assurances ;

4° Les agents mentionnés à l'article L. 1421-1 du code de la santé publique ;

5° Les administrateurs et les inspecteurs des affaires maritimes, les officiers du corps technique et administratif des affaires maritimes, les contrôleurs des affaires maritimes, les commandants des bâtiments de l'Etat et les commandants de bord des aéronefs de l'Etat chargés de la surveillance de la mer.

Les agents mentionnés aux 1° à 5° sont astreints au secret professionnel dans les conditions et sous les sanctions prévues aux articles 226-13 et 226-14 du code pénal.

II. – Les agents mentionnés au I ont accès à tout moment aux établissements, aux locaux et aux installations où sont réalisées les opérations spatiales ainsi qu'à l'objet spatial. Ces dispositions ne sont pas applicables à la partie des locaux ser-

vant de domicile, sauf entre six heures et vingt et une heures, et sur autorisation du président du tribunal de grande instance ou du magistrat qu'il délègue à cette fin.

Au plus tard au début des opérations de contrôle, l'opérateur est avisé qu'il peut assister aux opérations et se faire assister de toute personne de son choix, ou s'y faire représenter.

III. – Dans le cadre de leur mission de contrôle, les agents mentionnés au I peuvent demander communication de tous les documents ou pièces utiles, quel qu'en soit le support. Ils peuvent en prendre copie et recueillir sur convocation ou sur place les renseignements et justifications nécessaires.

Les agents ne peuvent emporter des documents qu'après établissement d'une liste contresignée par l'opérateur. La liste précise la nature des documents et leur nombre.

L'opérateur est informé par l'autorité administrative mentionnée à l'article 2 des suites du contrôle. Il peut lui faire part de ses observations.

IV. – Si l'opérateur ou la personne ayant qualité pour autoriser l'accès à l'établissement, au local ou à l'installation ne peut être atteint ou s'il s'oppose à l'accès, les agents mentionnés au I peuvent demander au président du tribunal de grande instance ou au juge délégué par lui à y être autorisés.

Article 8

S'agissant du lancement ou de la maîtrise d'un objet spatial, l'autorité administrative ou, sur délégation de celle-ci, les agents habilités par elle à cet effet peuvent à tout moment donner les instructions et imposer toutes mesures qu'ils considèrent comme nécessaires dans l'intérêt de la sécurité des personnes et des biens et de la protection de la santé publique et de l'environnement.

L'autorité administrative ou les agents habilités agissant sur sa délégation consultent l'opérateur au préalable, sauf dans le cas où existe un danger immédiat.

CHAPITRE IV

Sanctions administratives et pénales

Article 9

Les autorisations délivrées en application de la présente loi peuvent être retirées ou suspendues en cas de manquement du titulaire aux obligations qui lui incombent, ou lorsque les opérations en vue desquelles elles ont été sollicitées apparaissent de nature à compromettre les intérêts de la défense nationale ou le respect par la France de ses engagements internationaux.

En cas de suspension ou de retrait de l'autorisation de maîtrise d'un objet spatial lancé, l'autorité administrative peut enjoindre à l'opérateur de prendre, à ses frais, les mesures propres, au regard des règles de bonne conduite communément admises, à limiter les risques de dommage liés à cet objet.

Article 10

Outre les officiers et agents de police judiciaire agissant conformément aux dispositions du code de procédure pénale, les agents mentionnés au I de l'article 7 et assermentés ont qualité pour rechercher et constater les infractions aux dispositions du présent chapitre et aux textes pris pour son application. Ils disposent, à cet effet, des pouvoirs prévus aux II à IV du même article.

Ils constatent ces infractions par des procès-verbaux qui font foi jusqu'à preuve contraire. Ils sont adressés au procureur de la République dans les cinq jours qui suivent leur clôture.

Un décret en Conseil d'Etat précise les modalités d'application du présent article.

Article 11

I. – Est puni d'une amende de 200 000 € le fait :

1° Pour tout opérateur, quelle que soit sa nationalité, de procéder sans autorisation au lancement d'un objet spatial à partir du territoire national ou de moyens ou installations placés sous juridiction française ou au retour d'un tel objet sur le territoire national ou sur des moyens ou installations placés sous juridiction française ;

2° Pour tout opérateur français, de procéder sans autorisation au lancement d'un objet spatial à partir du territoire d'un Etat étranger, de moyens ou d'installations placés sous la juri-

diction d'un Etat étranger ou d'un espace non soumis à la souveraineté d'un Etat ou au retour d'un tel objet sur le territoire d'un Etat étranger, sur des moyens ou des installations placés sous la juridiction d'un Etat étranger ou sur un espace non soumis à la souveraineté d'un Etat ;

3° Pour toute personne physique possédant la nationalité française ou personne morale ayant son siège en France, de faire procéder sans autorisation au lancement d'un objet spatial ou d'en assurer la maîtrise sans autorisation pendant son séjour dans l'espace extra-atmosphérique.

II. – Est puni d'une amende de 200 000 € le fait :

1° De transférer à un tiers sans autorisation la maîtrise d'un objet spatial dont le lancement ou la maîtrise a été autorisé au titre de la présente loi ;

2° Pour tout opérateur français, de prendre sans autorisation la maîtrise d'un objet spatial dont le lancement n'a pas été autorisé au titre de la présente loi.

III. – Est puni d'une amende de 200 000 € le fait pour un opérateur :

1° De poursuivre l'opération spatiale en infraction à une mesure administrative ou à une décision juridictionnelle d'arrêt ou de suspension ;

2° De poursuivre l'opération spatiale sans se conformer à une mise en demeure de l'autorité administrative de respecter une prescription.

IV. – Est puni d'une amende de 200 000 € le fait pour un opérateur ou une personne physique de faire obstacle aux contrôles effectués en application de l'article 7.

TITRE III

IMMATRICULATION

DES OBJETS SPATIAUX LANCÉS

Article 12

Dans les cas où l'obligation d'immatriculer incombe à la France en vertu de l'article II de la convention du 14 janvier 1975 sur l'immatriculation des objets lancés dans l'espace extra-atmosphérique et, le cas échéant, d'autres accords internationaux, les objets spatiaux lancés sont inscrits sur un registre d'immatriculation tenu, pour le compte de l'Etat, par le Centre national d'études spatiales selon des modalités fixées par décret en

Conseil d'Etat.

TITRE IV

RESPONSABILITÉS

CHAPITRE I^{er}

Responsabilité à l'égard des tiers

Article 13

L'opérateur est seul responsable des dommages causés aux tiers du fait des opérations spatiales qu'il conduit dans les conditions suivantes :

1° Il est responsable de plein droit pour les dommages causés au sol et dans l'espace aérien ;

2° En cas de dommages causés ailleurs qu'au sol ou dans l'espace aérien, sa responsabilité ne peut être recherchée que pour faute.

Cette responsabilité ne peut être atténuée ou écartée que par la preuve de la faute de la victime.

Sauf cas de faute intentionnelle, la responsabilité prévue aux 1° et 2° cesse quand toutes les obligations fixées par l'autorisation ou la licence sont remplies ou, au plus tard, un an après la date où ces obligations auraient dû être remplies. L'Etat se substitue à l'opérateur pour les dommages intervenus passé ce délai.

Article 14

Lorsqu'en vertu des stipulations du traité du 27 janvier 1967 sur les principes régissant les activités des Etats en matière d'exploration et d'utilisation de l'espace extra-atmosphérique, y compris la Lune et les autres corps célestes, ou de la convention du 29 mars 1972 sur la responsabilité internationale pour les dommages causés par des objets spatiaux, l'Etat a réparé un dommage, il peut exercer une action récursoire contre l'opérateur à l'origine de ce dommage ayant engagé la responsabilité internationale de la France, dans la mesure où il n'a pas déjà bénéficié des garanties financières ou d'assurance de l'opérateur à hauteur de l'indemnisation.

Si le dommage a été causé par un objet spatial utilisé dans le cadre d'une opération autorisée en application de la présente loi, l'action récursoire s'exerce :

1° Dans la limite du montant fixé dans les conditions mentionnées à l'article 16 en cas de dommage causé pendant la phase de lancement ;

2° Dans la limite du montant fixé dans les conditions mentionnées à l'article 17 en cas de dommage causé après la phase de lancement, y compris à l'occasion du retour sur Terre de l'objet spatial.

En cas de faute intentionnelle de l'opérateur, les limites prévues aux 1° et 2° ne s'appliquent pas.

L'Etat n'exerce pas d'action récursoire en cas de dommage causé par un objet spatial utilisé dans le cadre d'une opération autorisée en application de la présente loi et résultant d'actes visant les intérêts étatiques.

Article 15

Lorsqu'un opérateur a été condamné à indemniser un tiers à raison d'un dommage causé par un objet spatial utilisé dans le cadre d'une opération autorisée en application de la présente loi, et à la condition que l'opération en cause ait été conduite depuis le territoire de la France ou d'un autre Etat membre de l'Union européenne ou partie à l'accord sur l'Espace économique européen, ou à partir de moyens ou installations placés sous la

juridiction de la France ou d'un autre Etat membre de l'Union européenne ou partie à l'accord sur l'Espace économique européen, cet opérateur bénéficie, sauf cas de faute intentionnelle, de la garantie de l'Etat selon les modalités prévues par la loi de finances :

1° Pour la part de l'indemnisation excédant le montant fixé dans les conditions mentionnées à l'article 16 en cas de dommage causé pendant la phase de lancement ;

2° Pour la part de l'indemnisation excédant le montant fixé dans les conditions mentionnées à l'article 17 en cas de dommage causé au sol ou dans l'espace aérien après la phase de lancement, y compris à l'occasion du retour sur terre de l'objet spatial.

En cas de dommage causé pendant la phase de lancement, la garantie de l'Etat bénéficie, le cas échéant et dans les conditions prévues aux alinéas précédents, aux personnes qui n'ont pas la qualité de tiers à une opération spatiale, au sens de la présente loi.

Article 16

Dans le cadre fixé par la loi de finances, l'autorisation délivrée en application de la présente loi fixe, compte tenu des risques encourus, eu égard notamment aux caractéristiques du site de lancement, le montant en deçà duquel et au-delà duquel sont, respectivement, en cas de dommages causés pendant la phase de lancement, exercée l'action récursoire et octroyée la garantie de l'Etat.

Article 17

Dans le cadre fixé par la loi de finances, l'autorisation délivrée en application de la présente loi fixe, compte tenu des risques encourus, le montant en deçà duquel et au-delà duquel sont, respectivement, en cas de dommages causés après la phase de lancement, exercée l'action récursoire et octroyée la garantie de l'Etat.

Article 18

Toute personne mise en cause devant une juridiction à raison d'un dommage au titre duquel elle serait susceptible de bé-

néficier de la garantie de l'Etat en informe l'autorité administrative compétente qui peut, au nom de l'Etat, exercer tous les droits de la défense dans le procès. A défaut d'une telle information, la personne mise en cause est réputée avoir renoncé au bénéfice de la garantie de l'Etat.

CHAPITRE II

Responsabilité à l'égard des personnes participant à l'opération spatiale

Article 19

Lorsque, pour indemniser un tiers, l'assurance ou la garantie financière mentionnées à l'article 6 ainsi que, le cas échéant, la garantie de l'Etat ont été mises en jeu, la responsabilité de l'une des personnes ayant participé à l'opération spatiale ou à la production de l'objet spatial à l'origine du dommage ne peut être recherchée par une autre de ces personnes, sauf en cas de faute intentionnelle.

Article 20

En cas de dommage causé par une opération spatiale ou la production d'un objet spatial à une personne participant à cette opération ou à cette production, la responsabilité de toute autre personne participant à l'opération spatiale ou à la production de l'objet spatial à l'origine du dommage et liée à la précédente par un contrat ne peut être recherchée à raison de ce dommage, sauf stipulation expresse contraire portant sur les dommages causés pendant la phase de production d'un objet spatial destiné à être maîtrisé dans l'espace extraatmosphérique ou pendant sa maîtrise en orbite, ou cas de faute intentionnelle.

TITRE V

DISPOSITIONS RELATIVES

AU CODE DE LA RECHERCHE

Article 21

Le code de la recherche est ainsi modifié :

1o L'article L. 331-6 est ainsi rédigé :

« *Art. L. 331-6. - I. -* Le président du Centre national d'études spatiales exerce, au nom de l'Etat, la police spéciale de l'exploitation des installations du Centre spatial guyanais dans un périmètre délimité par l'autorité administrative compétente. A ce titre, il est chargé d'une mission générale de sauvegarde consistant à maîtriser les risques techniques liés à la préparation et à la réalisation des lancements à partir du Centre spatial guyanais

afin d'assurer la protection des personnes, des biens, de la santé publique et de l'environnement, au sol et en vol, et il arrête à cette fin les règlements particuliers applicables dans les limites du périmètre mentionné

ci-dessus.

« *II. -* Le président du Centre national d'études spatiales coordonne, sous l'autorité du représentant de l'Etat dans le département, la mise en oeuvre, par les entreprises et autres organismes installés dans le périmètre défini au I, des mesures visant à assurer la sûreté des installations et des activités qui y sont menées, et s'assure du respect, par ces entreprises et organismes, des obligations qui leur incombent à ce titre.

« *III. -* Dans la mesure strictement nécessaire à l'accomplissement des missions prévues aux I et II, les agents que le président du Centre national d'études spatiales habilite ont accès aux terrains et locaux à usage exclusivement professionnel et occupés par les entreprises et organismes installés au Centre spatial guyanais dans le périmètre défini au I. » ;

2° Après l'article L. 331-6, sont insérés deux articles L. 331-7 et L. 331-8 ainsi rédigés :

« *Art. L. 331-7. -* Le président du Centre national d'études spatiales peut, par délégation de l'autorité administrative mentionnée à l'article 8 de la loi no 2008-518 du 3 juin 2008 relative aux opérations spatiales et pour toute opération spatiale, prendre les mesures nécessaires prévues au même article pour garantir la sécurité des personnes et des biens ainsi que la protection de la santé publique et de l'environnement.

« *Art. L. 331-8.* - Un décret en Conseil d'Etat fixe les conditions d'application du présent chapitre, notamment les conditions dans lesquelles le président du Centre national d'études spatiales peut déléguer sa compétence mentionnée à l'article L. 331-6. »

TITRE VI

PROPRIÉTÉ INTELLECTUELLE

Article 22

I. – L'article L. 611-1 du code de la propriété intellectuelle est complété par un alinéa ainsi rédigé :

« Sauf stipulation contraire d'un engagement international auquel la France est partie, les dispositions du présent article s'appliquent aux inventions réalisées ou utilisées dans l'espace extra-atmosphérique y compris sur les corps célestes ou dans ou sur des objets spatiaux placés sous juridiction nationale en application de l'article VIII du traité du 27 janvier 1967 sur les principes régissant les activités des Etats en matière d'exploration et d'utilisation de l'espace extra-atmosphérique, y compris la Lune et les autres corps célestes. »

II. – L'article L. 613-5 du même code est complété par un e ainsi rédigé :

« *e)* Aux objets destinés à être lancés dans l'espace extra-atmosphérique introduits sur le territoire français. »

TITRE VII

DONNÉES D'ORIGINE SPATIALE

Article 23

Tout exploitant primaire de données d'origine spatiale exerçant en France une activité présentant certaines caractéristiques techniques définies par décret en Conseil d'Etat doit préalablement en faire la déclaration à l'autorité administrative compétente.

Ces caractéristiques techniques sont notamment fonction de la résolution, de la précision de localisation, de la bande de fré-

quence d'observation et de la qualité des données d'observation de la Terre faisant l'objet de la programmation d'un système satellitaire ou reçues.

Article 24

L'autorité administrative compétente s'assure que l'activité des exploitants primaires de données d'origine spatiale ne porte pas atteinte aux intérêts fondamentaux de la Nation, notamment à la défense nationale, à la politique extérieure et aux engagements internationaux de la France.

A ce titre, elle peut, à tout moment, prescrire les mesures de restriction à l'activité des exploitants primaires de données d'origine spatiale nécessaires à la sauvegarde de ces intérêts.

Article 25

Est puni d'une amende de 200 000 € le fait, par tout exploitant primaire de données d'origine spatiale, de se livrer à une activité présentant les caractéristiques techniques mentionnées à l'article 23 :

1° Sans avoir effectué la déclaration mentionnée à l'article 23 ;

2° Sans respecter les mesures de restriction prises sur le fondement de l'article 24.

TITRE VIII

DISPOSITIONS TRANSITOIRES ET FINALES

Article 26

La présente loi ne s'applique pas au lancement et au guidage, pour les besoins de la défense nationale, d'engins dont la trajectoire traverse l'espace extra-atmosphérique, notamment les missiles balistiques.

Ne sont pas soumises aux dispositions du titre VII les activités d'exploitant primaire de données d'origine spatiale exercées par le ministère de la défense.

Article 27

En tant qu'elles relèvent d'une mission publique confiée au Centre national d'études spatiales après approbation de l'autorité administrative en application du quatrième alinéa de l'article L. 331-2 du code de la recherche, ne sont pas soumises aux dispositions des titres II et IV les opérations de lancement, de retour sur terre, de maîtrise ou de transfert de maîtrise d'un objet spatial et aux dispositions du titre VII les activités satellitaires d'observation de la Terre et de réception des données d'observation de la Terre.

Article 28

L'article L. 331-2 du code de la recherche est complété par un *f*, un *g* et un *h* ainsi rédigés :

« *f*) D'assister l'Etat dans la définition de la réglementation technique relative aux opérations spatiales ;

« *g*) D'exercer, par délégation du ministre chargé de l'espace, le contrôle de la conformité des systèmes et des procédures mis en oeuvre par les opérateurs spatiaux avec la réglementation technique mentionnée au *f*;

« *h*) De tenir, pour le compte de l'Etat, le registre d'immatriculation des objets spatiaux. »

Article 29

Les articles 16 et 17 de la présente loi entrent en vigueur à compter de la publication de la loi de finances qui fixe le minimum et le maximum entre lesquels est compris le montant au-delà duquel est octroyée la garantie de l'Etat.

Article 30

La présente loi est applicable en Nouvelle-Calédonie, en Polynésie française, dans les îles Wallis et Futuna et dans les Terres australes et antarctiques françaises.

La présente loi sera exécutée comme loi de l'Etat.

Fait à Paris, le 3 juin 2008.

Par le Président de la République :
NICOLAS SARKOZY

Le Premier ministre,
FRANÇOIS FILLON

La ministre de l'intérieur, de l'outre-mer et des collectivités
territoriales,

MICHÈLE ALLIOT-MARIE

Le ministre des affaires étrangères et européennes,
BERNARD KOUCHNER

La ministre de l'enseignement supérieur et de la recherche,
VALÉRIE PÉCRESSE

Le ministre de la défense,
HERVÉ MORIN

(1) Travaux préparatoires : loi no 2008-518.

Sénat :

Projet de loi no 297 (2006-2007) ;

Rapport de M. Henri Revol, au nom de la commission
des affaires économiques, no 161 (2007-2008) ;

Discussion et adoption le 16 janvier 2008 (TA no 50).

Assemblée nationale :

Projet de loi, adopté par le Sénat, no 614 ;

Rapport de M. Pierre Lasbordes, au nom de la com-
mission des affaires économiques, no 775 ;

Discussion et adoption le 9 avril 2008 (TA no 120).

Sénat :

Projet de loi no 272 (2007-2008) ;

Rapport de M. Henri Revol, au nom de la commission
des affaires économiques, no 328 (2007-2008) ;

Discussion et adoption le 22 mai 2008 (TA no 97).

This is an unofficial translation of France's "LOI no 2008-518 du 3 juin 2008 relative aux opérations spatiales". It is being offered to the readership of the JOURNAL OF SPACE LAW as a convenience.¹

TITLE I

DEFINITIONS

Article 1

For the purposes of this Act :

1° The term "damage" means damage to persons or property, and in particular to public health or to the environment, directly caused by a space object as part of a space operation, to the exclusion of the consequences arising from the use of the signal transmitted by this object for users;

2° The term "space operator", thereafter referred to as "the operator": means any natural or juridical person carrying out a space operation under its responsibility and independently;

3° The term "space operation" means any activity consisting in launching or attempting to launch an object into outer space, or of ensuring the commanding of a space object during its journey in outer space, including the Moon and other celestial bodies, and, if necessary, during its return to Earth;

4° The term "launching phase" means the period of time which, as part of a space operation, starts at the moment when the launching operations become irreversible and which, without prejudice to provisions contained, if necessary, in the authorization granted pursuant to the present act, ends when the object to be put in outer space is separated from its launch vehicle.

5° The term "phase of command" means the period of time starting as part of a space operation at the moment when the

¹ Translated by Philippe Clerc and Julien Mariez, Centre National d' Etudes Spatiales Legal Department, Paris, France.

object to be put in outer space is separated from its launch vehicle and ending when the first of the following events occurs:

- when the final manoeuvres for de-orbiting and the passivation activities have been completed;
- when the operator has lost control over the space object;
- the return to Earth or the full disintegration of the space object into the atmosphere;

6° The term “third party to a space operation” means any natural or juridical person other than those taking part in the space operation or in the production of the space object(s) the launch or command of which is part of the operation. In particular, the space operator, its contractors, its subcontractors and its customers, as the contractors and subcontractors of its customers, are not regarded as third parties.

7° The term “space-based data primary operator” means any natural or juridical person ensuring the programming of an Earth observation satellite system or the reception of Earth observation data from outer space.

TITLE II

AUTHORIZATION OF SPACE OPERATIONS

CHAPTER 1

OPERATIONS SUBJECT TO AUTHORIZATION

Article 2

The following shall obtain an authorization from the administrative authority:

1° Any operator, whatever its nationality, intending to proceed with the launching of a space object from the national territory or from means or facilities falling under French jurisdiction, or intending to proceed with the return of such an object onto the national territory or onto facilities falling under French jurisdiction;

2° Any French operator intending to proceed with the launching of a space object from the territory of a foreign State or from means or facilities falling under the jurisdiction of a foreign State or from an area that is not subject to the sovereignty of a State, or intending to proceed with the return of such an object onto the territory of a foreign State or onto means and facilities falling under the jurisdiction of a foreign State or onto an area that is not subject to the sovereignty of a State;

3° Any natural person having French nationality or juridical person whose headquarters are located in France, whether it is an operator or not, intending to procure the launching of a space object or any French operator intending to command such an object during its journey in outer space.

Article 3

The transfer to a third party of the commanding of a space object which has been authorized pursuant to the terms of the present act is subject to prior authorization from the administrative authority.

Pursuant to the provisions of paragraph 3 of Article 2, any French operator intending to take the control of a space object whose launching or control has not been authorized under the present act shall obtain to this end a prior authorization from the administrative authority.

The terms of application of the present article are set forth by decree passed at the Council of State.

CHAPTER 2

CONDITIONS FOR GRANTING AUTHORIZATIONS

Article 4

Authorizations to launch, to command or to transfer the commanding of a space object launched and to proceed with its return to Earth are granted once the administrative authority has checked the moral, financial and professional guarantees of the applicant, and if necessary of its shareholders, and has ascertained that the systems and procedures that it intends to

implement are compliant with the technical regulations set forth, in particular for the safety of persons and property, the protection of public health and the environment.

Authorizations cannot be granted when the operations for which they were requested, regarding in particular the systems intended to be implemented, are likely to jeopardise national defence interests or the respect by France of its international commitments.

Licenses certifying for a determined time period that a space operator satisfies moral, financial and professional guarantees may be granted by the administrative authority competent for issuing authorizations. These licenses may also attest the compliance of the systems and procedures referred to in the first paragraph with the technical regulations set forth. Lastly, these licenses may be equivalent to authorizations for certain operations.

A decree passed at the Council of State shall set forth the terms of application of the present article. It shall specify in particular:

1° The information and documents to be provided to support applications for authorizations, as well as the granting procedure for these authorizations;

2° The administrative authority competent for granting authorizations and for setting forth the technical regulations referred to in the first paragraph;

3° The conditions in which the licenses mentioned in the third paragraph can be granted, and the modes in which the beneficiary of such a license informs the administrative authority of the space operations he undertakes;

4° When an authorization is solicited for an operation which is to be carried out from the territory of a foreign State or from means or facilities falling under the jurisdiction of a foreign State, the conditions in which the administrative authority may exempt the applicant from all or any part of the compliance checking mentioned in the first paragraph, when the national and international commitments made by that State as well as its legislation and practices include sufficient guarantees re-

garding the safety of persons and property and the protection of public health and the environment, and liability matters.

CHAPTER III

OBLIGATIONS OF AUTHORIZATIONS HOLDERS

Article 5

The authorizations granted pursuant to the present act may include requirements set forth for the safety of persons and property, protection of public health and the environment, in particular in order to limit risks related to space debris.

These requirements may also be set forth in order to protect the national defence interests or to ensure the respect by France of its international commitments.

Article 6

I. – Any operator subject to authorization pursuant to the present act shall have and maintain, as long as it can be held liable pursuant to Article 13 and for the amount set out in Articles 16 and 17, insurance or another financial guarantee approved by the competent authority.

A decree passed at the Council of State shall set forth the terms of insurance, the nature of the financial guarantees that may be accepted by the competent authority and the conditions in which the fulfilment of the requirements referred to in the previous paragraph is proved to the authority having granted the authorization. It also specifies conditions in which the administrative authority may exempt the operator from the requirements set out in the previous paragraph.

II. – The insurance or financial guarantee must cover the risk of having to compensate for the damages that could be caused to third parties to the space operation up to the amount mentioned in the first paragraph.

III. – The insurance or financial guarantee must cover the following persons to the extent of their liability for the damage caused by a space object:

- 1° The Government and its public bodies;
- 2° The European Space Agency and its Member States;
- 3° The operator and the persons having taken part in the production of the space object or in the space operation.

Article 7

I. – The following are empowered to proceed with the necessary controls in order to ascertain that the obligations set out in the present chapter are fulfilled:

1° The agents commissioned by the administrative authority mentioned in Article 2 in the conditions set forth in a decree passed at the Council of State, and belonging to the Government departments in charge of Space, Defence, Research, Environment or to its public bodies carrying out their missions in the same fields;

2° The agents empowered to perform technical checkings aboard aircrafts;

3° The members of the Insurance Control Body mentioned in Article L. 310-13 of the Insurance Code;

4° The agents mentioned in Article L. 1421-1 of the Public Health Code;

5° The administrators and inspectors of maritime affairs, the officers from the technical and administrative body of maritime affairs, the maritime affairs controller, the commandants of the State ships and aircrafts in charge of maritime surveillance.

The agents mentioned above are bound by professional confidentiality under the conditions and penalties set out by Article 226-13 and 226-14 of the Penal Code.

II. – Agents mentioned in part I. above shall have access at any time to the buildings, premises and facilities where space operations are conducted and to the space object itself. These provisions are not applicable to the part of the premises being used as a residence, except between 6 a.m. and 9 p.m. upon authorization from the President of the *tribunal de grande in-*

stance (court of first instance of general jurisdiction) or by the judge it empowered to do so.

The operator is informed at the latest when the controlling operations begin that he may attend the operations and be assisted by any person of his choice, or that he can be represented for that purpose.

III. – As part of their controlling assignment, the agents mentioned in part I. above can ask for any document or useful item, irrespective of their *medium*. They can make copies and gather any necessary information and justification, *in situ* or upon notification.

The agents can take documents away only after having established a list countersigned by the operator. This list specifies the nature and quantity of the documents.

The operator shall be informed by the administrative authority mentioned in Article 2 of the control follow up and may transmit its observations.

If the operator or the person empowered to grant access to the building, premise or facility can not be contacted or if he denies access, the agents mentioned in part I. above may seek permission from the President of the *Tribunal de grande instance*, or from the judge empowered to do so.

Article 8

Concerning the launching or the control of the space object, the administrative authority, or the agents acting on its authority and empowered by it to this end, may at any moment give instructions and require any measures they consider necessary for the safety of persons and property, the protection of public health and the environment.

The administrative authority and the agents acting on its authority shall consult the operator beforehand, unless there is an immediate danger.

A decree passed at the Council of State shall specify the terms of delegation and capacitation of the agents in charge of the enforcement of the present article.

CHAPTER IV

ADMINISTRATIVE AND PENAL SANCTIONS

Article 9

The authorizations granted according to the terms of the present Act can be revoked or suspended in case the holder contravenes to its obligations, or when the operations for which they were sought are likely to jeopardise the national defence interests or the respect by France of its international commitments.

In case of suspension or withdrawal of the authorization to command a launched space object, the administrative authority may enjoin the operator to take, at its own expenses, the appropriate measures regarding the commonly admitted good rules of conduct to limit the risks of damage due to that object.

Article 10

In addition to the judicial police officers and agents acting following the prescriptions of the Code of Criminal Procedure, the sworn agents mentioned in the first paragraph of Article 7 are authorized to investigate and record breaches to the prescriptions of the present Chapter and of the texts issued for its enforcement. To this end, they exercise the powers set out in paragraphs II. and IV. of the same article.

They record these breaches in reports which are considered authentic unless the contrary is proved. They are sent to the *Procureur de la République* (Head of the Prosecution Department at courts of first instance of general jurisdiction) within five days after their issuing.

A decree adopted passed at the Council of State shall set forth the terms of application of the present article.

Article 11

I. – The following shall give rise to a fine of € 200 000:

1° Any operator, whatever its nationality, proceeding without authorization to the launching of a space object from the na-

tional territory or from means or facilities falling under French jurisdiction, or to the return of such an object onto the national territory or onto means or facilities falling under French jurisdiction;

2° Any French operator proceeding without authorization to the launching of a space object from the territory of a foreign State, from means or facilities falling under the jurisdiction of a foreign State, or from an area not subject to a State's sovereignty or to the return of such an object onto the territory of a foreign State, onto means or facilities falling under the jurisdiction of a foreign State or onto an area not subject to a State's sovereignty.

3° Any natural person having French nationality or juridical person having its headquarters in France procuring the launching of a space object without authorization, or commanding it without authorization during its journey into outer space.

II. – The following shall give rise to a fine of € 200 000:

1° Transferring to a third party without authorization the commanding of a space object which launching or commanding has been authorized according to the terms of the present act;

2° Any French operator undertaking without authorization the commanding of a space object which launching has not been authorized according to the present law.

III. – An operator shall be fined € 200 000 in the case of:

1° pursuing the space operation in breach of an administrative measure or court decision ordering its ceasing or suspension;

2° pursuing the space operation without complying with an administrative summon to comply with a prescription.

IV. – Is fined € 200 000 the fact for operators or individuals to prevent controls undertaken pursuant to Article 7.

TITLE III

REGISTRATION OF LAUNCHED SPACE OBJECTS

Article 12

In the event France has a registration obligation according to Article II of the Convention dated 14 September 1975 relating to Registration of objects launched into outer space, and, if necessary, of other international agreements, the launched space objects are registered in a registry held by the Centre National d'Etudes Spatiales on behalf of the State, following the prescriptions set out in a decree passed at the Council of State.

TITLE IV

LIABILITY

CHAPTER 1

LIABILITY TOWARDS THIRD PARTIES

Article 13

The operator shall be solely liable for damages caused to third parties by the space operations which it conducts in the following conditions:

1° He shall be absolutely liable for damages caused on the ground or in airspace;

2° He shall be liable only due to his fault for damages caused elsewhere than on the ground or in airspace.

This liability may only be reduced or set aside in case the fault of the victim is proven.

Except in case of wilful misconduct, the liability set forth in 1° and 2° ends when all the obligations set out in the authorization or the license are fulfilled, or at the latest one year after the date on which these obligations should have been fulfilled. The Government shall be liable in the operator's place for damages occurring after this period.

Article 14

When the Government has paid compensation for damage according to the stipulations of the Treaty dated 27 January 1967 relating to Principles Governing the Activities of States in the Exploration and Use of outer Space, including the Moon and other Celestial Bodies, or of the Convention dated 19 march 1972 relating to International Liability for Damage caused by Space Objects, it may present a claim for indemnification against the operator having caused the damage for which France was held internationally liable, to the extent that the Government has not already benefited from the insurance or financial guarantees of the operator up to the amount of the compensation.

If the damage was caused by a space object used as a part of an operation authorized according to the terms of the present Act, the claim for indemnification may be brought:

1° within the limit of the amount set out pursuant to the conditions mentioned in article 16 in the case of damage caused during the launching phase;

2° within the limit of the amount set out pursuant to the conditions mentioned in Article 17 in the case of damage caused after the launching phase, including when the space object returns to Earth.

In case of a wilful misconduct of the operator, the limitations set out in 1° and 2° shall not apply.

The Government shall not present a claim for indemnification if the damage was caused by a space object used as a part of an operation authorized according to the terms of the present Act and resulting from acts targeting governmental interests.

Article 15

When an operator has been condemned to compensate a third party for a damage caused by a space object used as a part of an operation authorized according to the terms of the present Act, and if that operation has been undertaken from the French territory or from the territory of another Member State of the

European Union or from the territory of a State party to the European Economic Area Agreement, or from means or facilities falling under the jurisdiction of France or another Member State of the European Union or of a State party to the European Economic Area Agreement, that operator shall benefit, except in case of a wilful misconduct, from the governmental guarantee, according to the terms of the Finance Act:

1° For the part of the compensation exceeding the amount set out in the conditions mentioned in Article 16, in the case of a damage caused during the launching phase;

2° For the part of the compensation exceeding the amount set out in the conditions mentioned in Article 17, in the case of a damage caused on the ground or in airspace after the launching phase, including when the space object returns to Earth.

In the case of damage caused during the launching phase, the governmental guarantee shall benefit, if necessary and in the conditions set out in the paragraphs above, to the persons who are not third parties to a space operation pursuant to the present Act.

Article 16

Within the framework set forth in the Finance Act, the authorization granted pursuant to the present Act shall set out, given the risks incurred and regarding in particular the characteristics of the launching site, the amount respectively below and beyond which the claim for indemnification is exercised and the governmental guarantee is granted, in the case of a damage caused during the launching phase.

Article 17

Within the framework set forth in the Finance Act, the authorization granted pursuant to the present Act shall set out, given the risks incurred, the amount respectively below and beyond which the claim for indemnification is exercised and the governmental guarantee is granted, in the case of a damage caused after the launching phase.

Article 18

Any person questioned before a court because of a damage for which he could benefit from the governmental guarantee shall inform the competent administrative authority, which may exercise all the defence rights in the proceedings on behalf of the Government. If he fails to do so, the questioned person shall be deemed to having waived to the governmental guarantee.

CHAPTER II

LIABILITY TOWARDS PERSONS TAKING PART IN THE
SPACE OPERATION

Article 19

When the insurance or financial guarantee mentioned in Article 6 as well as, if necessary, the governmental guarantee have been laid out to indemnify a third party, one of the persons having taken part in the space operation or in the production of the space object which caused the damage cannot be held liable by another of these persons, except in case of a wilful misconduct.

Article 20

In the case of a damage caused by a space operation or the production of a space object to a person taking part in this operation or in that production, any other person taking part in the space operation or in the production of the space object having caused the damage and bound to the previous one by a contract cannot be held liable because of that damage, unless otherwise expressly stipulated regarding the damage caused during the production phase of a space object which is to be commanded in outer space or during its commanding in orbit, or in case of a wilful misconduct.

TITLE V

PROVISIONS RELATING TO THE RESEARCH CODE

Article 21

The Research Code is amended as follows:

1° Article L. 331-6 is drafted as follows:

“*Art. L. 331-6.* – I. – The President of the Centre National d’Etudes Spatiales shall exercise on behalf of the State the special Police for the exploitation of the facilities of the Guiana Space Centre, within a perimeter defined by the competent administrative authority. As such, it shall be in charge of a general mission of safeguard consisting in controlling the technical risks related to the preparation and carrying out of the launches from the Guiana Space Centre in order to ensure the protection of persons, property, public health and the environment, on the ground and during the flight, and it shall set out to this end the specific regulations applicable within the limits of the perimeter defined above.

“II. Under the authority of the Government representative in the *Département* of Guiana, the President of the Centre National d’Etudes Spatiales shall coordinate the implementation by companies and other entities settled in the perimeter defined in part I. above of measures taken in order to ensure the security of the facilities and of the activities undertaken therein, and shall verify that those companies and agencies fulfil their obligations in this respect.

“III. To the extent strictly necessary for the accomplishment of the missions set out in parts I. and II., the agents empowered by the President of the Centre National d’Etudes Spatiales have access to the land and premises used exclusively for professional purposes and occupied by the companies and agencies settled at the Guiana Space Centre in the perimeter defined in part I. above.”

2° Articles L. 331-7 and L. 331-8 are inserted after Article L. 331-6 and are drafted as follows:

“*Art. L. 331-7.* – The President of the Centre National d’Etudes Spatiales may take for any space operation, by delegation of the administrative authority mentioned in Article 8 of the Act n° 2008-518 dated June 3rd relating to space operations, the necessary measures provided for in the same article to ensure the safety of persons and property, as well as the protection of public health and the environment.”

“*Art. L. 331-8.* – A decree passed at the Council of State shall set forth the terms of application of the present chapter, particularly the conditions in which the President of the Centre National d’Etudes Spatiales may delegate its competence mentioned in Article L. 331-6.”

TITLE VI

INTELLECTUAL PROPERTY

Article 22

I. – Article L. 611-1 of the Intellectual Property Code is completed by a paragraph drafted as follows:

“Unless otherwise provided in an international agreement to which France is a party, the provisions of the present article apply to the inventions made or used in outer space, including onto celestial bodies and into or onto space objects placed under national jurisdiction according to article VIII of the Treaty dated 27 January 1967 relating to Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other celestial bodies.”

II. – Article L. 613-5 of the same Code is completed by an e) drafted as follows:

“e) To the objects intended to be launched in outer space brought onto the French territory.”

TITLE VII

SPACE-BASED DATA

Article 23

Any primary space-based data operator undertaking in France an activity having certain technical characteristics defined in a decree passed at the Council of State must preliminarily declare it to the competent administrative authority.

These technical characteristics are related in particular to the resolution, location accuracy, observation frequency band and quality of the Earth observation data which are received or for which a satellite system is programmed.

Article 24

The competent administrative authority ascertains that the activity undertaken by the primary operators of space-based data does not harm fundamental interests of the Nation, particularly defence matters, foreign policy and international commitments of France.

To this end, it may at any time prescribe measures restraining the activity of the primary space-based data operators, which are necessary to safeguard these interests.

Article 25

Any primary space-based data operator undertaking an activity showing the technical characteristics mentioned in Article 23 shall be fined € 200 000 in the case:

1° it fails to proceed with the declaration mentioned in Article 23;

2° it fails to comply with the restriction measures taken pursuant to Article 24.

TITLE VIII

TRANSITORY AND FINAL PROVISIONS

Article 26

The present Act does not apply to the launching and guiding, for the needs of national defence, of vehicles which trajectory passes through outer space, in particular ballistic missiles.

The activities of the Ministry of Defence acting as primary space-based data operator are not subject to the provisions of Title VII.

Article 27

As they fall under the scope of a public mission assigned to the Centre National d'Etudes Spatiales after approval by the administrative authority pursuant to paragraph 4 of Article L. 331-2 of the Research Code, the operations of launching, returning to Earth, commanding or transfer of commanding of a space object are not subject to the provisions of Titles II and IV, and the Earth observation satellite activities and the reception of Earth observation data are not subject to the provisions of Title VII

Article 28

Article L. 331-2 of the Research Code is completed by an *f*), a *g*) and an *h*) drafted as follows:

“*f*) To assist the Government in the definition of the technical regulations relating to space operations;

“*g*) To verify, by delegation of the minister in charge of space, that the systems and procedures implemented by the space operators comply with the technical regulation mentioned in paragraph *f*);

“*h*) To hold the register of the space objects on behalf of the Government.”

Article 29

Articles 16 and 17 of the present Act shall enter into force at the date of publication of the Finance Act setting out the minimum and the maximum amounts between which is included the amount beyond which the governmental guarantee is granted.

Article 30

The provisions of the present Act are applicable in New-Caledonia, in French Polynesia, in the Islands of Wallis and Futuna and in the French southern and Antarctic lands.

This Act shall be implemented as a State Act.

Paris, 3rd of June 2008

This is an unofficial translation of Japan's "Fundamental Act of Outer Space". It is being offered to the readership of the JOURNAL OF SPACE LAW as a convenience.¹

FUNDAMENTAL ACT OF OUTER SPACE (LAW NO.43, 2008)

(Enacted on 21 May 2008 and entered into force
on 27 August 2008)

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CHAPTER ONE

GENERAL PROVISIONS

(Purposes)

Article One

As we recognize that the significance of outer space exploitation and utilization (hereinafter referred to as “space use and exploitation”) is increasing along with advancing science technologies and changing situations in and around our country, the purposes of this law shall be to promote in a planned and comprehensive manner the overall policies and measures concerning space use and exploitation; to contribute to improving our citizens’ living standards and developing our economic society; and to dedicate to peace and welfare for all human beings in the world. We shall attain these purposes in line with the pacifist principle of the Japanese Constitution and in harmony with the environment. We also shall expand the roles space use and exploitation plays in our country by making and enforcing fundamental rules and principles concerning space use and exploitation; by clarifying responsibilities the government should take for space use and exploitation; by drafting the Outer Space Master Plan; and by establishing the Outer Space Exploitation Strategy Headquarters.

(Peaceful Use of Outer Space)

Article Two

Space use and exploitation shall be carried out in conformity with the pacifist principle of the Japanese Constitution and in accordance with outer space treaties and other international promises, including “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies.”

(Improvement of Citizens’ Living Standards)

Article Three

Space use and exploitation shall be carried out to improve our citizens' living standards; to form a safe and secured society; to remove any kind of threats to our lives, such as natural disasters and poverty; and to maintain peace and security in our homeland and the world.

(Industrial Development)

Article Four

Space use and exploitation shall be carried out for our country's space industries to enhance their technologies and to strengthen their international competitiveness. This shall be attained by implementing space use and exploitation in a planned and positive manner and by encouraging to smoothly set up businesses and to use and practice the results of research and development in space use and exploitation.

(Development of The Human Society)

Article Five

As we recognize that a collection of knowledge on outer space is an intellectual property for human beings, space use and exploitation shall be carried out to advance outer space science and to practice cutting-edge space use and exploitation. This will be able to realize mankind's dreams about outer space and to develop our human society.

(International Cooperation)

Article Six

Space use and exploitation shall be carried out to positively play our country's roles in the international society and to increase our country's interests therein by actively conducting diplomacy and international cooperation with regard to space use and exploitation.

(Consideration to Environment)

Article Seven

Space use and exploitation shall be carried out with careful consideration for effects on the environment which space use and exploitation can cause.

(The Government's Obligations)

Article Eight

The government shall formulate and implement comprehensive policies and measures concerning space use and exploitation in compliance with the fundamental principles mentioned from Article Two to Article Seven (hereinafter referred to as "the fundamental principles").

(Local Public Organizations' Efforts)

Article Nine

Local public organizations shall make efforts to formulate and implement their own policies and measures concerning space use and exploitation, which take advantage of features in their local areas. Their policies and measures shall comply with the fundamental principles and appropriately share burdens with the national government.

(Mutual Cooperation)

Article Ten

Mutual cooperation among the national government, local public organizations, universities, and private business entities will be able to efficiently promote space use and exploitation. Taking this into consideration, the national government shall take policies and measures necessary to strengthen the cooperation among these participants.

(Legislative and Other Measures)

Article Eleven

The national government shall take legislative, fiscal, taxational, and financial measures that are necessary to implement fundamental policies concerning space use and exploitation.

(Maintenance of Government Organizations)

Article Twelve

The national government shall make efforts to maintain its administrative organizations and to improve its administrative operations when it implements policies and measures concerning space use and exploitation.

CHAPTER TWO

FUNDAMENTAL POLICIES AND MEASURES

(Utilization of Artificial Satellites for Improving the People's Living Standard)

Article Thirteen

The national government shall take up policies and measures necessary to maintain and promote information communication networks, remote-sensing information systems, positioning information systems. These networks and systems shall be stable using artificial satellites in order to improve our citizens' living standards, to form a safe and secured society, and to remove any kind of threats to our lives, such as natural disasters and poverty.

(Peace and Security in Domestic and International Society)

Article Fourteen

The national government shall take up policies and measures necessary to promote space use and exploitation which helps us keep peace and security in our homeland and the whole world.

(Independent Launches of Artificial Satellites)

Article Fifteen

It is significant that our country has capacities to independently develop, launch, trace and operate artificial satellites. Recognizing this, the national government shall take up policies and measures necessary to promote research and development of machines (including components thereof) and technologies; to maintain launch sites and facilities; and to obtain frequencies our country may use in the course of space use and exploitation.

(Space Use and Exploitation Promoted by Private Business Entities)

Article Sixteen

Recognizing that private business entities play essential roles in space use and exploitation, the national government shall promote private business activities (including research and development) concerning space use and exploitation, and encourage our country's space industry and ancillary industries to enhance their technologies and international competitiveness. When the government carry out space use and exploitation by themselves, they need to make the most of abilities of private business entities and make a plan to purchase goods and services from the private sector. The national government also shall take up policies and measures necessary to maintain launch sites (i.e., locations from which a launch takes place) and any other facilities for experiments and research; to enable private business entities to make effective use of the results of research on space use and exploitation conducted by the government; to promote setting up businesses which use and practice the results of research on space use and exploitation; and to make it easier for the private sector to invest space industries in terms of taxes and finance.

(Maintenance and Improvement of Reliability)

Article Seventeen

Recognizing that it is significant to maintain and improve reliability of technologies concerning space use and exploitation,

the national government shall take up policies and measures necessary to promote basic research and develop fundamental technologies on space use and exploitation.

(Promotion of Cutting-Edge Space Use and Exploitation)

Article Eighteen

The national government shall take up policies and measures necessary to promote academic research concerning cutting-edge space use and exploitation, and space science including space exploration.

(Promotion of International Cooperation)

Article Nineteen

The national government shall positively play our country's roles in the field of space use and exploitation, and increase our country's interests in the international society. The national government also shall take up policies and measures necessary to strengthen international cooperation concerning space use and exploitation, such as forming an international league for research and development and sharing technologies with other countries, and to make our country's space use and exploitation understood more deeply by foreign countries.

(Protection of Environment)

Article Twenty

The national government shall take up policies and measures necessary to promote space use and exploitation in harmony with environment.

Section 2—The national government shall strive themselves to cooperate with other countries for protection of space environment.

(Development of Human Resources)

Article Twenty One

In order to promote space use and exploitation, the national government shall take up policies and measures necessary to maintain and develop human resources involved in space use and exploitation, intimately cooperating with universities and private business entities.

(Promotion of Education)

Article Twenty Two

The national government shall take up policies and measures necessary to promote education and strengthen public relations concerning space use and exploitation, so as to deepen the citizens' appreciation and understanding of space use and exploitation.

(Information Control Regarding Space Use and Exploitation)

Article Twenty Three

Since space use and exploitation has unique characteristics, the national government shall take up policies and measures necessary to properly manage and control information regarding space use and exploitation.

CHAPTER THREE

OUTER SPACE MASTER PLAN

Article Twenty Four

The Outer Space Exploitation Strategy Headquarters shall formulate a fundamental plan concerning space use and exploitation (hereinafter referred to as the "Outer Space Master Plan"), in order to promote policies and measures concerning space use and exploitation in a planned and comprehensive manner.

Section 2—The Outer Space Master Plan shall contain:

- a) basic directions with regard to promotion of space use and exploitation;
- b) policies and measures concerning space use and exploitation which the national government shall carry out in a planned and comprehensive manner;
- c) other than the preceding a) and b), whatever is necessary for the national government to promote the policies and measures concerning space use and exploitation in a planned and comprehensive manner.

Section 3—In principle, the Outer Space Master Plan shall establish concrete goals for the policies and measures described therein, and provide the time period for attaining the goals.

Section 4—When the Outer Space Master Plan has been formulated per Section 1 of this Article, the Outer Space Exploitation Strategy Headquarters shall officially announce it without delay via the Internet and any other appropriate means.

Section 5—The Outer Space Exploitation Strategy Headquarters, at an appropriate time, shall conduct a survey on progress toward the goals described in Section 3 of this Article, and shall officially announce the survey result via the Internet and any other appropriate means.

Section 6—Considering the progress in space use and exploitation as well as the effect of the policies and measures carried out by the national government with regard to space use and exploitation, the Outer Space Exploitation Strategy Headquarters, at an appropriate time, shall review the Outer Space Master Plan, and if necessary, make changes therein. Section 4 of this Article *mutatis mutandis* applies to the changes made in Outer Space Master Plan.

Section 7—In order to obtain funds necessary to smoothly operate the Outer Space Master Plan, the government shall, every fiscal year, make efforts to take necessary steps, such as formulating a budget for the Outer Space Master Plan, as far as the country's financial situation permits.

CHAPTER FOUR

OUTER SPACE EXPLOITATION STRATEGY HEADQUARTERS

(Establishment)

Article Twenty Five

The Outer Space Exploitation Strategy Headquarters (hereinafter referred to as “the Headquarters”) shall be established in the Cabinet so as to promote in a planned and comprehensive manner policies and measures concerning space use and exploitation.

(The Headquarters’ Missions)

Article Twenty Six

The missions of the Headquarters are listed below:

- a) drafting the Outer Space Master Plan and promoting to carry it out; and,
- b) researching and discussing significant policies and measures concerning space use and exploitation other than Outer Space Master Plan, and promoting and arranging to carry them out.

(Composition)

Article Twenty Seven

The Headquarters is composed of the chief, deputy chiefs and other members of the Outer Space Exploitation Strategy Headquarters.

(The Chief of the Outer Space Exploitation Strategy Headquarters)

Article Twenty Eight

The Headquarters is headed by the chief of the Outer Space Exploitation Strategy Headquarters (hereinafter referred to as “the Chief”). The Prime Minister is assigned as the Chief.

Section 2—The Chief shall oversee all activities of the Headquarters, and direct and supervise its officials.

(Deputy Chiefs of the Outer Space Exploitation Strategy Headquarters)

Article Twenty Nine

The Headquarters has deputy chiefs of the Outer Space Exploitation Strategy Headquarters (hereinafter referred to as “the Deputy Chiefs”). Both the Chief Cabinet Secretary and the Minister of Outer Space Exploitation (i.e., a minister appointed by the Prime Minister who is in charge of assisting the Prime Minister with regard to space use and exploitation) are assigned as the Deputy Chiefs.

Section 2—The Deputy Chiefs shall assist the Chief.

(Members of the Outer Space Exploitation Strategy Headquarters)

Article Thirty

The Headquarters has members of the Outer Space Exploitation Strategy Headquarters (hereinafter referred to as “Members”).

Section 2—Every minister of the Cabinet other than the Chief and the Deputy Chiefs is assigned as a Member.

(Documents Submission and Other Cooperation)

Article Thirty One

The Headquarters may call for documents, advice, explanation, and other cooperation which the Headquarters finds necessary for its missions, to affiliated government agencies, local public organizations, chiefs of independent administrative institutions which are stipulated by Independent Administrative Institutions Act (Law No. 103, 1999), and representatives of government-affiliated corporations established by or under specific laws which are governed by Article 4, Section 15 of General Affairs Ministry Act (Law No. 91, 1999).

Section 2—The Headquarters may call for cooperation which it finds particularly essential for its missions, to anyone other than entities listed in the previous section.

(Affairs)

Article Thirty Two

The Cabinet Secretariat conducts affairs of the Headquarters, and assistant deputy chief cabinet secretaries are assigned to direct the affairs.

(The Chief Minister)

Article Thirty Three

The Prime Minister is the chief minister who Cabinet Act (Law No.5, 1947) provides is in charge of affairs and activities of the Headquarters.

(Cabinet Orders)

Article Thirty Four

Cabinet orders may, if necessary, stipulate affairs and activities of the Headquarters other than those provided by this law.

CHAPTER FIVE

IMPROVEMENT OF LEGAL SYSTEMS CONCERNING
OUTER SPACE ACTIVITIES

Article Thirty Five

The government shall improve legal systems in a planned, speedy and comprehensive manner by enacting laws regulating outer space activities and laws necessary to perform treaties and other international promises concerning space use and exploitation.

Section 2—The legal systems in the previous section shall be helpful to increase our country's interests in the interna-

tional society and to promote space use and exploitation in the private business sector.

Supplementary Provisions

(Date of Enforcement)

Article One

This law shall be enforced on the day designated by a government ordinance within three months from the day of this law's promulgation.

(Enacting Laws for The Cabinet Office to Conduct Secretarial Affairs of The Headquarters)

Article Two

Approximately one year after this law is enforced, the government shall enact laws and take other necessary steps so that the Cabinet Office can conduct secretarial affairs of the Headquarters.

(Reviewing the Japan Aerospace Exploration Agency)

Article Three

Approximately one year after this law is enforced, the government shall review the aims, functions and structures of the Japan Aerospace Exploration Agency and other agencies conducting space use and exploitation.

(Reviewing Administrative Organizations for Promoting Space Use and Exploitation Policies Comprehensively and integratively)

Article Four

The government shall deliberate how administrative organizations should be for promoting space use and exploitation policies comprehensively and integratively, and take necessary steps accordingly.

Grounds for Submitting This Bill

In order to promote in a planned and comprehensive manner the overall policies and measures concerning space use and exploitation, it is necessary to establish and realize the fundamental principles, and to clarify the government's responsibilities for space use and exploitation. It is also necessary to draft the Outer Space Master Plan and to create the Outer Space Exploitation Strategy Headquarters. These are the grounds for submitting this bill.

Supplementary Resolutions

Resolutions Regarding Promotion of Space Use and Exploitation

As the Fundamental Act of Outer Space is enforced, the government need to take into the surest consideration the following subject matters:

Section 1—Space use and exploitation shall be based on the pacifism under the Japanese Constitution, and shall be carried out in harmony with outer space environments and in order to improve not only our citizens' living standards but also interests in the whole world.

Section 2—The Outer Space Exploitation Strategy Headquarters shall be established in the Cabinet. When the Headquarters, as a control center, promote in a planned and comprehensive manner policies and measures concerning space use and exploitation of our country, they shall make efforts to take enough opinions of space science experts and to have them reflected in the policies and measures.

Section 3—When the government set up the organization in the Cabinet Office which will conduct secretarial affairs of the Outer Space Exploitation Strategy Headquarters, they shall make efforts to promote strategically, comprehensively and integratively space use and exploitation policies, such as formulating the Outer Space Master Plan, enacting laws pertinent to space use and exploitation, and administering budgets for space use and exploitation.

In addition, the government should appoint as the head of the said organization a person who is free from special interests

of governmental organs, and able to make decisions from a broad view of things. Furthermore, the officials of the said organization shall not be appointed in favor of special governmental organs. Instead, they should be appointed widely and impartially from the Japan Aerospace Exploration Agency or other agencies, and private business entities conducting space use and exploitation.

Section 4—Before the organization in the Cabinet Office starts to conduct secretarial affairs of the Headquarters about one year after this law is enforced, the government shall deliberate from the future perspective how the said organization should be for promoting space use and exploitation policies comprehensively and integratively, and shall enact laws and take other necessary steps accordingly.

Besides, when the said organization in the Cabinet Office conducts secretarial affairs of the Headquarters, they shall do it integratively and strategically, keeping close contacts with relevant governmental organs.

Section 5—The Japan Aerospace Exploration Agency shall be administered in accordance with the Outer Space Master Plan, so as to realize the fundamental principles regarding outer space exploitation under this law. About one year after its enforcement, the government shall review the JAXA's aim, function, structure, scope of businesses, and ancillary administrative agencies, including the JAXA law.

In addition, around one year after this law takes effectiveness, the government shall study consolidation of some agencies pertinent to outer space exploitation.

Furthermore, the government shall study the aim and function of the Outer Space Exploitation Committee in relation to the Outer Space Exploitation Strategy Headquarters.

Section 6—In or around two years after this law is enforced, the government shall strive to enact laws regulating outer space activities in line with treaties and other international promises concerning space use and exploitation.

We, Committee on the Cabinet of House of Representatives and Committee on the Cabinet of House of Councilors, have resolved as mentioned above.

This is an unofficial translation of Iran's "Statute of the Iranian Space Agency". It is being offered to the readership of the JOURNAL OF SPACE LAW as a convenience.¹

The Cabinet of the Islamic Republic of Iran in its meeting of June 11, 2005, according to proposal number 100/14310 dated 9 August 2004 of the Ministry of Communications and Information Technology and citing the Article 9 of the Law for Tasks and Authorizations of the Ministry of Communications and Information Technology approved on 10 December 2003 by the Parliament, passed the statute of the Iranian Space Agency as follows:

STATUTE OF THE IRANIAN SPACE AGENCY

Article 1- Aiming at implementing the approvals of the Space Supreme Council of Iran and the study, research, designing, engineering and conducting the issues of space service and remote sensing technologies, and strengthening the communication networks and space technology inside and out of the country, and collection of the sovereignty activities of the Iranian Remote Sensing Center and the Ministry of Communications and Information Technology, benefiting the facilities and human resource of the Department of Design, Engineering and Installation of Satellite Communications and Department of Maintenance of Satellite Communications both affiliated with

¹ Translated by Parviz Tarikhi (28 August 2008). The Persian version is available at <http://www.itna.ir/archives/documents/010742.php>. Mr. Tarikhi heads the Microwave Remote Sensing Department at the Mahdasht Satellite Receiving Station. He has been involved with the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) since 2000, including as second vice-chair and rapporteur in 2004-06 of the committee bureau. Since 2001 he has co-chaired Action Team number 1 of UNISPACE-III with the mission "to develop a comprehensive worldwide environmental monitoring strategy". From 2004-07 he conducted the Office for Specialized International Co-operation of the Iranian Space Agency. He is also a freelance journalist and technical writer. Some of Mr. Tarikhi's writings may be found on the National Center for Remote Sensing, Air, and Space Law's website blog at <http://rescommunis.wordpress.com>.

the Telecommunications Company of Iran, the Iranian Space Agency which is briefly referred to as “Agency” in this Statute, is established.

Article 2- As a legal entity, the Agency is a financially independent official foundation affiliated with the Ministry of Communications and Information Technology.

Article 3- Agency’s tasks and authorizations are as follows:

- I. Pursuance and implementing the approvals of the Space Supreme Council,
- II. Preparing and regulation of mid and long-term programs for country’s space sector in cooperation with related institutions for proposing to the Space Supreme Council,
- III. Study for policy making in designing, manufacturing, launching and using research and applied satellites and providing space services for proposing to the Space Supreme Council,
- IV. Planning to conduct and develop of the peaceful uses of outer space and space technology, strengthening the national, regional and international communication networks by the state, cooperative and private sectors and monitoring their implementation at the framework of the policies approved by the Space Supreme Council,
- V. Applied specific study, research and education in developing space science and technologies,
- VI. Studying the requirements and implementing satellite and other space technology projects in the framework of the approvals of the Space Supreme Council,
- VII. Contribution to the implementation of the regional and national satellite projects in the framework of the approvals of the Space Supreme Council,
- VIII. Issuing the authorization for the space activities aiming at sustained and coordinated exploitation of space technologies and facilities including satellites, direct receiving and transmitting stations, and satellite control in the framework of the approvals of the Space Supreme Council,

- IX. Cooperation with related clients for assessing the competence of non-governmental contractors and advisors for implementing space related executive and research issues in different parts of the country,
- X. Representing, membership and attending related international and regional societies and unions aiming at protecting national interests in the framework of the regime's main policies and other laws and regulations,
- XI. Implementing regional and international cooperation programs in space issues in the framework of the regime's main policies,
- XII. Management and exploitation of satellite and orbital positions in coordination with responsible bodies and pursuing their international registration for optimum use of the space sources,
- XIII. Preparing and formulating the regulations and statutes related to the tasks included in the Article 9 of the Law for Tasks and Authorizations of the Ministry of Communications and Information Technology approved in 2003, for proposing to the legal clients.
- XIV. Establishing national archive and centralizing store, classification and updating of space data.

Nota Bene 1- The Agency is obliged to apply the highest capacity of the non-governmental sector in the framework of the policies of the Space Supreme Council for implementing its tasks and affairs.

Nota Bene 2- Distinguishing the security competence in the cases of the clauses VIII and IX in this Article will be the responsibility of the related clients.

Article 4- Agency's required credits will be provisioned and secured through the public funds and credits in the country's annual budget.

Nota Bene 1- The facilities, records, human resources and funds of the ongoing national and research projects in the Ministry of Communications and Information Technology is transferred to the Agency.

Nota Bene 2- By coordination of the Management and Planning Organization of Iran and in the framework of the annual budgets the Agency could use the assistance and other fund sources of the Ministry of Communications and Information Technology and its affiliated organizations and companies, and other institutions.

Article 5- The organizational chart of the Agency after formulating by the Agency and confirmation of the Management and Planning Organization of Iran will be effectual.

Article 6- The president of the Agency that is the Deputy Minister of Communications and Information Technology and the secretary of the Space Supreme Council at the same time, will be appointed by the Minister of Communications and Information Technology and will hold the highest executive position at the Agency.

Article 7- The president of the Agency is responsible for well implementing the affairs, protecting the rights, interests and assets of the Agency, and for managing the Agency and implementing the approvals of the Space Supreme Council will have full right and authorization in the framework of the regulations. He/she will represent the Agency before all legal authorities and real and legal entities with the right to depute the authorization to others, and he/she can delegate on his recognition and trust part of his/her authorization by the official notification to either of his/her deputies, managers or Agency's staff.

The Guardian Council according to the letter number 84/30/12612 dated 18 June 2005 passed this Statute.

*Translated to English by: Parviz Tarikhi
10 July 2008*

This is an unofficial translation of Iran's "Statute of the Iranian Space Agency". It is being offered to the readership of the JOURNAL OF SPACE LAW as a convenience.¹

The Cabinet of the Islamic Republic of Iran in its meeting of June 16, 2008, according to proposal number 1/27560 dated 9 August 2007 of the Ministry of Communications and Information Technology and citing Article 9 of the Law for Tasks and Authorizations of the Ministry of Communications and Information Technology approved on December 10, 2003 by the Parliament of the Islamic Republic of Iran, passed the statute of the Iranian Space Agency as follows:

STATUTE OF THE IRANIAN SPACE AGENCY

Article 1- Aiming at implementing its legal tasks and the study, research, designing, engineering and conducting the issues of space service and remote sensing technologies, and strengthening the communication networks and space technology inside and out of the country, and collecting of the sovereignty activities of the Iranian Remote Sensing Center and the Ministry of Communications and Information Technology, benefiting the facilities and human resource of the Department of Design, Engineering and Installation of Satellite Communications and Department of Maintenance of Satellite Communications both affiliated with the Telecommunications Company of

¹ Translated by Parviz Tarikhi (28 August 2008). The Persian version is available at <http://www.itna.ir/archives/documents/010742.php>. Mr. Tarikhi heads the Microwave Remote Sensing Department at the Mahdasht Satellite Receiving Station. He has been involved with the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) since 2000, including as second vice-chair and rapporteur in 2004-06 of the committee bureau. Since 2001 he has co-chaired Action Team number 1 of UNISPACE-III with the mission "to develop a comprehensive worldwide environmental monitoring strategy". From 2004-07 he conducted the Office for Specialized International Co-operation of the Iranian Space Agency. He is also a freelance journalist and technical writer. Some of Mr. Tarikhi's writings may be found on the National Center for Remote Sensing, Air, and Space Law's website blog at <http://rescommunis.wordpress.com>.

Iran, the Iranian Space Agency which is briefly referred to as "Agency" in this Statute, is established.

Article 2- As a legal entity, the Agency is a financially independent official foundation affiliated with the Ministry of Communications and Information Technology and will be managed based on its specific financial and trade laws and regulations in the framework of the laws and regulations of the Islamic Republic of Iran.

Article 3- Agency's tasks and authorizations are as follows:

- I. Implementing the study, research, designing, engineering and operating issues in the fields of space service technologies, remote sensing and strengthening the communications and space technology networks inside and outside of the country as well as the sovereignty tasks of the Iranian Remote Sensing Center and the Ministry of Communications and Information Technology,
- II. Preparing and regulating the mid and long-term programs for country's space sector in cooperation with related institutions for proposing to the relevant referents,
- III. Study for policy making in designing, manufacturing, launching and using research and applied satellites and providing space services for proposing to the legally cognizable referents,
- IV. Doing research, designing, manufacturing and launch of the commercial, scientific and research satellites, and designing and establishing control center and launch of national satellites in cooperation with related institutions,

Nota Bene- The above said issues excluding launch and satellite control center could be implemented by the non-governmental sector in care of the Agency.

- V. Planning to conduct and develop the peaceful uses of outer space, celestial bodies, astronomy and space technology, strengthening the national, regional and international communication networks by the state,

- cooperative and private sectors and monitoring their implementation in the framework of the major policies of the country,
- VI. Study, research, technology development and applied specific education in developing space science and technologies,
 - VII. Studying the requirements and implementing satellite and other space technology projects in the framework of the related laws and regulations,
 - VIII. Contribution to the implementation of the national, regional and international satellite projects in the framework of the major policies of the regime and other related laws and regulations,
 - IX. Implementing the allotted sovereignty tasks through providing space sector signal (including voice, image and data) for the land sector applicants, issuing authorization for the activities in space aiming at integral management of the country's space sector and sustained and coordinated exploitation of space technologies and facilities including satellites, network of private or national satellites (including satellite mobile), direct receiving and transmitting stations, and satellite control in the framework of the related rules and regulations,
 - X. Getting the approved tariffs for offering space services and issuing the authorization for activity in space,
 - XI. Assessing the competence of non-governmental contractors and advisors for implementing space related executive and research issues in different parts of the country in the framework of related laws and regulations,
 - XII. Representing, membership and attending related international and regional societies and unions aiming at protecting national interests in the framework of the regime's major policies and other laws and regulations,
 - XIII. Implementing regional and international cooperation programs in space issues in the framework of the regime's major policies,

- XIV. Management and exploitation of satellite and orbital positions in coordination with responsible bodies and pursuing their international registration for optimum use of space sources,
- XV. Study and planning for securing the space sector needs of the country's whole satellite networks for providing satellite services through the national, regional and international satellites in the framework of the laws and regulations,
- XVI. Preparing and formulating the regulations and statutes related to the tasks included in the article 9 of the Law for Tasks and Authorizations of the Ministry of Communications and Information Technology approved in 2003, for proposing to the legal referents for approval,
- XVII. Establishing national archive and centralizing store, classification and updating of space data.

Nota Bene 1- The Agency is obliged to apply the highest capacity of the non-governmental sector in the framework of the major policies of the regime for implementing its tasks and affairs.

Nota Bene 2- Distinguishing the security competence in the cases of the clauses IX and XI in this article will be the responsibility of the related referents.

Nota Bene 3- The Agency is authorized to proceed for establishing space research centers and firms with the endorsement of the Council for Development of Higher Education in the framework of the laws and regulations.

Nota Bene 4- Regarding the clause X, the Agency is obliged to act based on the rates approved by the Cabinet and settle the funds to the public revenue account (near the General Treasurer).

Article 4- Agency's required credits will be provisioned and secured through the public funds and credits in the country's annual budget and will be expended in the framework of the Agency's specific statutes subject of the article 2 of this Statute and other related laws and regulations.

Nota Bene- In coordination of the Planning and Strategic Monitoring Deputyship of the President of the Islamic Republic

of Iran and in the framework of the annual budgets, the Agency is authorized to use the financial allowance and other trust funds of the Ministry of Communications and Information Technology and its affiliated organizations and firms and other institutions.

Article 5- In implementing clause 10 of article 68 of the Law for Management of Country Service approved in 2007, the Agency in coordination of the Management and Human Assets Development Deputyship of the President of the Islamic Republic of Iran is authorized to make necessary superior payments with the endorsement of the Cabinet to draw and retain appropriate human resources for the specialized and managerial positions.

Article 6- The organizational chart of the Agency after formulating by the Agency and confirmation of the Management and Human Assets Development Deputyship of the President of the Islamic Republic of Iran will be effectual.

Article 6- The president of the Agency that is the Deputy Minister of Communications and Information Technology will be appointed by the above-mentioned Minister and will hold the highest executive position at the Agency.

Article 7- The president of the Agency is responsible for well implementing the affairs, protecting the rights, interests and assets of the Agency, and for managing the Agency will have full right and authorization in the framework of the regulations. He/she will represent the Agency before all legal authorities and real and legal entities with the right to depute the authorization to others, and he/she can delegate on his recognition part of his/her authorization by the official notification to either of his/her deputies, managers or Agency's staff.

The Guardian Council of the Constitution of the Islamic Republic of Iran according to letter number 87/30/27483 dated 2 July 2008 passed this Statute.

The Ministry of Communications and Information Technology is noticed of this approval through letter number 62999 T 38571 H on July 15, 2008.

CASENOTE

THE PRIVATIZATION OF PUBLIC POLICY: *EOSAT V. NASA* AND THE APPLICATION OF ANTITRUST LIABILITY TO FEDERALLY- SUPPORTED MONOPOLIES

*Jason A. Crook**

INTRODUCTION

Throughout the course of history, political sovereigns have recognized the importance of private enterprise in advancing policy objectives and national development. From the quest to find a better method of food preservation for Napoleon's army to the latest advances in remote sensing, political institutions have rewarded those who produce items or provide services which advance society and the quality of life.¹ While the protection offered by a patent or copyright may entice an entity to invest

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¹ As early as the Fifteenth Century, the Venetian Government recognized the need to provide inventors with a limited form of protection against those who would misappropriate their ideas. As the Patent Statute of 1474 held:

It being forbidden to every other person in any of our territories and towns to make any further device conforming with and similar to said one, without the consent and license of the author, for the term of 10 years. And if anyone builds it in violation hereof, the aforesaid author and inventor shall be entitled to have him summoned before any magistrate of this City, by which magistrate the said infringer shall be constrained to pay him hundred ducats; and the device shall be destroyed at once.

DONALD S. CHISUM ET AL., PRINCIPLES OF PATENT LAW 11 (2004).

some amount of time and effort into a prospective venture, governments have realized since the early Seventeenth Century the significant additional effects which can accrue when a firm is granted monopolistic power.² Cost savings can be maximized through economies of scale, duplicative waste can be reduced, and the overall return to the State can be increased beyond what is produced by competition. At its essence, the privatization of public policy through a grant of monopoly can be seen as symbolizing the perceived value and national importance of a centralized activity undisturbed by competition.

In 1992, Congress found that although “[t]he national interest of the United States [lay] in maintaining international leadership in satellite land remote sensing . . . funding and organizational uncertainties over the past several years ha[d] placed its future [leadership] in doubt . . .”³ To resolve this dilemma, Congress passed the Land Remote Sensing Policy Act of 1992. In passing the Act, it affirmed that “commercialization of land remote sensing should remain a long-term goal of United States policy” but recognized that “[f]ull commercialization . . . cannot be achieved within the foreseeable future . . .”⁴ To bridge the gap between national policy and economic reality, Congress provided that the Department of Defense and NASA would “be responsible for the management of the *Landsat* program” including the funding and launch of the *Landsat* system, while a private contractor would be hired for the program’s actual operation.⁵ The desire for fiscal discipline and the concomitant goal of maintaining leadership in remote sensing thus re-

² GLENN J. AMES, *THE GLOBE ENCOMPASSED: THE AGE OF EUROPEAN DISCOVERY, 1500-1700* 102-03 (2008). Following its establishment in 1602, the Dutch East India Company was granted an initial twenty-one year monopoly by the States-General of the Netherlands to conduct colonization activities in Asia. Under this public grant of private monopoly, the company was empowered to wage war, coin money, and negotiate treaties. *Id.*

³ Land Remote Sensing Policy Act of 1992, 15 U.S.C. § 5601 (1992).

⁴ *Id.* As a reflection of the strength of the privatization movement, Congress stated that “the United States Government should adopt a data policy . . . which allows competition within the private sector for distribution of unenhanced data and value-added services” so that “development of the remote sensing market and the provision of commercial value-added services . . . should remain exclusively the function of the private sector.” *Id.*

⁵ *Id.* at § 5611(a-d) (1992).

quired the *Landsat* system to be operated by a private contractor occupying a federally-supported monopoly position.

THE HISTORY OF LANDSAT

In September 1969, the *Landsat* program was initiated as a joint development between NASA and the U.S. Geological Survey.⁶ Built to orbit the Earth every ninety-nine minutes at an altitude of approximately 700 kilometers (435 miles), each of the satellites in the *Landsat* system operates by capturing images of selected locations and then relaying this information to receiving stations scattered across the world.⁷ In its first twenty years of operation, the *Landsat* system collected over three million images which were used in everything from “oil and mineral exploration, crop assessments, land-use planning, [and] environmental management [to] map-making.”⁸ As technology has improved, each subsequent satellite has carried increasingly-sophisticated instruments capable of providing greater detail and enhanced functionality.⁹

Motivated by the need to decrease direct governmental expenditures and in anticipation of the *perceived* commercial demand for *Landsat* data, Congress passed the Land Remote Sensing Commercialization Act in 1984.¹⁰ This act “authorized

⁶ H.R. Rep. No. 102-539, at 6 (1992).

⁷ *Id.*

⁸ *Id.* at 13.

⁹ See *supra* note 5.

¹⁰ Pub. L. No. 98-365, 98 Stat. 451. This anticipated commercial demand ultimately turned out to be little better than conjecture, as one report by the Office of Technology Assessment stated that “[u]ntil the market expands substantially, and more efficient spacecraft are developed and deployed, it could cost the Federal Government as much to subsidize a private owner as to continue operating the system itself.” Joanne Irene Gabrynowicz, *The Perils of Landsat from Grassroots to Globalization: A Comprehensive Review of US Remote Sensing Law with a Few Thoughts for the Future*, 6 CHI. J. INT’L L. 45, 54 n.28 (2005). Quoting Gabrynowicz further, “EOSAT was bound by a broad application of the nondiscriminatory access policy, which required making the data available to all who requested it. However, the company interpreted that to mean it had to charge the same price for all users turning nondiscriminatory access into nondiscriminatory pricing. The practical result was the same high prices were charged to all. The per image price rose from hundreds to thousands of dollars, virtually eliminating start-up value added companies, academia and developing nations as users.” *Id.* This loss of a ready customer base thus contributed even further to the erosion of the program’s commercial viability.

the Department of Commerce to select a contractor to operate the *Landsat* system and . . . required system operators to make unenhanced remote-sensing data available to all users on a nondiscriminatory basis”¹¹ Under the terms of the agreement, the contractor would “assume responsibility for marketing and distributing existing *Landsat* data, [would operate] *Landsats 4* and *5*, and [would build] two new [*Landsat*] spacecraft[.]”¹² After a competitive bidding process, EOSAT¹³ was awarded the contract.¹⁴

With the passage of the Land Remote Sensing Policy Act of 1992, Congress repealed the 1984 Act and delegated the Government’s contractual authority to the *Landsat* Program Management.¹⁵ Empowered by legislative mandate to seek preferential pricing for Government agencies and affiliated users, the LPM was given thirty days after LRSPA’s enactment to “enter into negotiations with the *Landsat 6* contractor [EOSAT] to formalize an arrangement with respect to pricing, distribution, acquisition, archiving, and availability of unenhanced data for which the *Landsat 6* contractor ha[d] responsibility under its contract.”¹⁶ In the event a satisfactory agreement could not be reached, the LPM’s member agencies (NASA and the Department of Defense) were to jointly certify this determination to Congress along with a recommendation on how to proceed.¹⁷

After months of unsuccessful negotiation, the LPM sent EOSAT a draft copy of the letter it was considering submitting to Congress.¹⁸ While recognizing their disagreement on some issues, the LPM negotiation team had also “been instructed to make one more attempt to reach [an] agreement” with EOSAT.¹⁹

¹¹ H.R. Rep. No. 102-539, at 9 (1992).

¹² *Id.*

¹³ EOSAT, or Earth Observation Satellite Company, was formed as a joint venture between Martin Marietta and Hughes Aircraft Company. (Stipulation of Facts, at 1. On file with the JOURNAL OF SPACE LAW).

¹⁴ *See supra* note 10.

¹⁵ *See* 15 U.S.C. § 5601 *et seq.* (1992).

¹⁶ *Id.* at § 5613(a) (1992).

¹⁷ *Id.* at § 5613(b) (1992).

¹⁸ Stipulation of Facts, at 10. On file with the JOURNAL OF SPACE LAW.

¹⁹ *Id.*

Two weeks later, the launch of *Landsat 6* failed.²⁰ Two days after that, EOSAT accepted the LPM's Statement of Principles.²¹ On April 11, 1994, EOSAT and LPM signed a revised document ("Provisions for *Landsat 4* and *5* Operations") which allowed EOSAT to continue operating the *Landsat* system through the satellites' practical demise in exchange for the Government receiving a price discount on all *Landsat* data services.²²

On May 5, 1994 by Presidential Directive, the Secretary of Commerce and the Secretary of the Interior were appointed to the LPM while the Secretary of Defense was removed.²³ Shortly after its appointment, the Department of Commerce became concerned that under the Competition in Contracting Act²⁴ the LPM could not enter into a sole-source contract extension with EOSAT and that it would have to solicit competitive offers.²⁵ On November 7, 1994, the Department issued a Commerce Business Daily Notice "announcing that it intended to enter into a sole-source contract extension with EOSAT" and that "interested parties" should notify the Department if they wished to be considered for competitive procurement.²⁶ EOSAT filed an agency protest against this but was advised that other parties had responded and that upon those expressions of interest, the Department intended to proceed with a competitive procurement.²⁷

EOSAT then filed suit against the Department of Commerce and NASA alleging that it was properly entitled to the

²⁰ *Id.* at 11.

²¹ *Id.* at 12.

²² *Id.* This agreement reflected a distinct policy shift away from the 1984 Act's mandate of making unenhanced *Landsat* data "available to all users on a nondiscriminatory basis . . ." See *supra* note 10. After the agreement, the Government data rate was reduced from \$4,400 per transaction to \$3,500 for the following year and \$2,500 after that. Per-scene prices were also reduced to \$70 instead of the \$280 regular users would pay. *Id.* at 12-13.

²³ Stipulation of Facts, at 13. On file with the JOURNAL OF SPACE LAW. The Department of Commerce had previously been involved with the *Landsat* program under the 1984 Act, but had been removed from active participation under the LRSPA. As such, the Presidential Directive represented a re-appointment to its earlier role. *Id.*

²⁴ 41 U.S.C. § 251 (1994).

²⁵ See *supra* note 18, at 15.

²⁶ *Id.* at 16-17.

²⁷ *Id.*

sole-source *Landsat* contract under the terms of the LRSPA and the parties' April 11 agreement.²⁸ Shortly thereafter, Earth Satellite Corporation (EarthSat) was granted leave to intervene in the lawsuit as a party defendant.²⁹ While supporting the Government's position that EOSAT was not entitled to a sole-source contract,³⁰ EarthSat also brought an antitrust action against the company.³¹ While the contractual claim against the Government could easily warrant a separate discussion, the antitrust matter is of far greater interest and thus receives the focus of this analysis.

EOSAT v. NASA

Although it would ultimately settle out of court, the case against EOSAT offers a rare glimpse into the antitrust liability of a federally-supported monopoly. Because the parties resolved their differences before an opinion could be rendered, it is uncertain how a court would have applied the antitrust laws to their arguments and what outcome it would have reached. Complicating things further, antitrust as a discipline has progressed substantially since the mid-1990s, so how the case would have been decided then may very well be different from how it would be decided today. Still, an analysis of the case from the present perspective is useful simply because the opportunities to evaluate the potential antitrust liability of a federally-supported monopoly are infrequent at best. Although styled primarily as a case against the Government, the true dispute worth analyzing is between EOSAT and EarthSat.

A. *The EOSAT Contract in Brief*

Before turning to the antitrust disagreement between EOSAT and EarthSat, it is important to establish a basic un-

²⁸ *Id.* at 17.

²⁹ Order Granting Motion to Intervene (Feb. 15, 1995). On file with the JOURNAL OF SPACE LAW.

³⁰ Mem. in Support of Defendants' Mot. Summ. J. (Feb. 2, 1995). On file with the JOURNAL OF SPACE LAW.

³¹ Counterclaim Against EOSAT (Feb. 24, 1995). On file with the JOURNAL OF SPACE LAW.

derstanding of the underlying contract dispute and the statutory interpretations which gave rise to the lawsuit in the first place. Recognizing that an entirely separate analysis could be written on the merits of the EOSAT-LPM agreement alone—particularly from an administrative law viewpoint—this is not intended to be an exhaustive foray into the intricate world of government procurement, but rather a brief overview of the circumstances leading to the EOSAT contract as it existed at the time of the dispute.

As previously mentioned, EOSAT was originally awarded the *Landsat* contract after a competitive bidding process hosted in the wake of the 1984 LRSCA's passage.³² This contract allowed EOSAT to operate the *Landsat* system and to have responsibility for marketing and distributing all existing *Landsat* data.³³ In 1992, Congress repealed the Commercialization Act and replaced it with the aforementioned LRSPA which realigned the Government's contractual approval mechanism to the *Landsat* Program Management.³⁴ With this restructuring, the LPM was empowered to formalize a new arrangement with EOSAT or in the event of a stalemate, to provide its recommendation to Congress on how to proceed.³⁵

After the appointment of the Department of Commerce, concerns were raised about the LPM's ability to enter into an indefinite contract extension with EOSAT in light of the Competition in Contracting Act's policy of disfavoring these types of agreements in favor of full and open competition.³⁶ In support of the Government's Motion for Summary Judgment, the argu-

³² See *supra* note 10.

³³ *Id.* Additionally, this contract had to "assure data continuity for six years, and provide that unenhanced data would be offered and sold on a nondiscriminatory basis. It could allow the contractor to use government civil space assets on a space available basis and at its own expense for a commercial system. The contract could not contain guaranteed data purchases from the Federal Government although the government could allow loans, loan guarantees, or payments to provide data continuity for six years. Marketing incentives were available by permitting a sliding scale that would decrease payments made by the contractor to the government for any services and hardware provided to it as sales levels increased." Gabrynowicz, *supra* note 10, 6 CHI. J. INT'L L. at 57-58.

³⁴ See *supra* note 15.

³⁵ *Id.*

³⁶ See *supra* note 24.

ment was raised that “an open ended extension of the contract was, as a practical matter, a new procurement which could only be awarded on a non-competitive basis if one of the seven exceptions to full and open competition set out [in CICA] applied.”³⁷ EOSAT disagreed, believing instead that the LPM’s actions were “contrary to the express Congressional mandate of [the LRSPA], which provided explicit directions as to how LPM was to proceed” with the contract extension; namely through the negotiation process followed by Congressional notification in the event of an impasse.³⁸ As the Government admitted in its supporting memorandum, “[t]he report to Congress required in Section 103(b) was prepared by the LPM, but it was not transmitted by the Office of Management and Budget to Congress.”³⁹ At its core, then, the dispute between EOSAT and the Government centered on how to interpret the language of the LRSPA—did the report to Congress constitute a simple advisement, or was it a necessary action before alternative bids could be solicited?

B. *Monopolistic Power*

During the past year [1888], a system of dark and mysterious combinations, known as “Trusts,” have sprung up in the industrial and commercial world. They have increased rapidly and have excited the alarm of thinking men. . . . It is the combination of a few men who wield all the powers of a mighty corporation without being subject to the limitations or responsibilities of a corporation. . . . Their power is unchecked by legal restraints or safeguards. They operate in secret and recognize no legal control or regulation. Their end is self enrichment. It is centralization of financial and commercial power without parallel or precedent. It is simply czarism in business.⁴⁰

Two years before the adoption of the landmark Sherman Antitrust Act,⁴¹ the passage above appeared in the American

³⁷ See Defendant’s Memorandum of Points and Authorities (Jan. 30, 1995) at 6. On file with the JOURNAL OF SPACE LAW.

³⁸ See EOSAT’s Memorandum in Support of its Motion for Summary Judgment (Jan. 30, 1995) at 3. On file with the JOURNAL OF SPACE LAW.

³⁹ See *supra* note 6, at 5 n.2.

⁴⁰ D.M. Mickey, *Trusts*, 22 AM. L. REV. 538 (1888).

⁴¹ 15 U.S.C. § 1 (1890).

Law Review. Although the Nineteenth Century fear of “centralization of financial and commercial power” might seem almost quaint when viewed against the backdrop of modern finance—a world in which a single bank has over \$1.8 trillion in assets and corporations routinely consider themselves multinational—the dangers of unchecked commercial power are still recognized as an area of legal concern.⁴² Since the founding days of the Republic, society has valued the principle that “every man shall have his [competitive] chance and that no man shall deprive him” of it.⁴³ Monopolistic entities were regarded as “an abnormal, unnatural, and dangerous development; a sort of financial anaconda, which crushes the life out of the small dealer by driving him into bankruptcy, and then swallows his profits.”⁴⁴

Against this unsavory view of capitalistic aggregation, it should have come as no great surprise when Congress passed by a nearly-unanimous vote Section Two of the Sherman Antitrust Act, which holds that “[e]very person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person [to monopolize] shall be deemed guilty of a felony.”⁴⁵ In the clearest of terms, it seemed, Congress was making a political repudiation of the monopolistic form. As history has shown, however, all monopolies are not created equal. In *Air Courier Conference of America v. American Postal Workers Union*, the Supreme Court reminisced that:

Since its establishment, the United States Postal Service has exercised a monopoly over the carriage of letters in and from the United States. The postal monopoly is codified in the [Private Express Statutes], 18 U.S.C. §§ 1693-1699 and 39 U.S.C. §§ 601-606. The monopoly was created by Congress as a reve-

⁴² Citigroup Balance Sheet (Dec. 31, 2006).

⁴³ See *supra* note 40.

⁴⁴ *Id.*

⁴⁵ 15 U.S.C. § 2 (1890). The term “monopoly” has been interpreted by the Supreme Court to mean “the power to control prices or exclude competition.” *United States v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377, 391 (1956).

nue protection measure for the Postal Service to enable it to fulfill its mission.⁴⁶

Elaborating further, the Supreme Court also ruled in *F.C.C. v. RCA Communications, Inc.* that:

Prohibitory legislation like the Sherman Law, defining the area within which 'competition' may have full play, of course loses its effectiveness as the practical limitations increase; . . . Surely it cannot be said in these situations that competition is of itself a national policy. To do so would disregard not only those areas of economic activity so long committed to government monopoly as no longer to be thought open to competition, such as the post office . . . and those areas, loosely spoken of as natural monopolies or—more broadly—public utilities, in which active regulation has been found necessary to compensate for the inability of competition to provide adequate regulation. It would most strikingly disregard areas where policy has shifted from one of prohibiting restraints on competition to one of providing relief from the rigors of competition, as has been true of railroads.⁴⁷

In areas of technological concern, Congress has also used its power to establish monopolies in order to protect certain critical industries from competition—even at the deliberate expense of existing companies. Quoting *N.V. Philips' Gloeilampenfabrieken v. Atomic Energy Commission*:

The Atomic Energy Act of 1946 declared the production of fissionable materials to be a Government monopoly. To accomplish this purpose, Section 11 of the Act revoked all existing patents useful exclusively in the production of fissionable ma-

⁴⁶ 498 U.S. 517, 519 (1991). As the American population increased and simultaneously spread out across the continent, certain postal routes inevitably became more profitable than others simply due to location and relative infrastructure. Given its mission of delivering mail throughout the *entire* country, the Postal Service and its congressional supporters were concerned that private competitors would seize the advantage on profitable routes (New York to Philadelphia, for instance) while leaving less profitable (Sioux Falls to St. Louis) or profit-negative routes to the financial detriment of the Postal Service. By granting the Postal Service a monopoly over the carriage of letters, Congress insured that smaller communities on less-profitable routes would continue receiving service. *Id.*

⁴⁷ 346 U.S. 86, 92 (1953).

terials, and prohibited the issuance of new patents insofar as they are useful for such purposes. In addition, it authorized the Government to utilize as necessary any other patent in the process of producing fissionable materials, without liability for infringement of such patents.⁴⁸

It is clear, then, that just because the Sherman Act makes it a felony to monopolize or attempt/conspire to monopolize, Congress has the authority to craft exemptions. As the LRSPA envisioned there being only one *Landsat* contractor,⁴⁹ EOSAT would necessarily have been a monopoly since it was the sole provider of a single resource. Since this monopoly was expressly granted by statute, however, it should not have faced liability on this point since one “does not violate the Sherman Act by virtue of the natural monopoly it holds over its own product.”⁵⁰

C. Price Discrimination & Refusal to Deal

Having established that EOSAT would not have faced anti-trust liability simply for possessing monopoly power, it is now necessary to analyze EarthSat’s complaints of being the target of price discrimination by EOSAT along with EOSAT’s refusal to deal with EarthSat as it had on previous terms. While these two claims are not legally synonymous, the specific facts of the case lend themselves to a combined discussion, and for the sake of analytical continuity the two issues will be presented collectively.

By virtue of its government contract, EOSAT possessed the exclusive right to market and distribute *Landsat* data.⁵¹ While the information obtained directly from the satellites certainly possessed value, the true worth of this data was maximized only when “value-added” companies enhanced the imagery to customer specifications.⁵² According to its Counterclaim, EarthSat’s business was centered around: (1) distributing unen-

⁴⁸ 316 F.2d 401, 404-05 (C.A.D.C. 1963).

⁴⁹ See *supra* note 10.

⁵⁰ *Mediacom Commc’ns Corp. v. Sinclair Broadcast Group, Inc.*, 460 F. Supp. 2d 1012, 1027 (S.D. Iowa 2006).

⁵¹ See *supra* note 10.

⁵² See *supra* note 31, at 2.

hanced *Landsat* tapes on EOSAT's behalf, and (2) enhancing these tapes as a provider of value-added services for its own customers.⁵³ According to its agreement with EOSAT, EarthSat "was compensated by a commission of 10% for sales of *Landsat* tapes with aggregate value of under \$50,000 and 20% for sales of *Landsat* tapes with aggregate value of over \$50,000"⁵⁴ EarthSat received no discount on data tapes purchased for its own use, but consistently sold more than the \$50,000 worth of tapes each year required to receive the 20% commission.⁵⁵ As both parties recognized, "[u]ntil the termination of the Agreement, EarthSat was the largest distributor of EOSAT tapes in North America."⁵⁶

On January 17, 1995, EarthSat received notice from EOSAT that its distributorship agreement would not be renewed.⁵⁷ EarthSat then informed EOSAT that "its decision to terminate the Agreement was discriminatory and would cause damage" to the company, and that it wished to be reinstated as an EOSAT distributor.⁵⁸ Upon its failure to achieve this desired result, EarthSat then brought suit against EOSAT seeking judicial relief.⁵⁹

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ *Id.* EarthSat "purchased and resold more than one-half million dollars worth of *Landsat* tapes in 1994." *Id.*

⁵⁷ Counterclaim Against EOSAT (Feb. 24, 1995) at 3. On file with the JOURNAL OF SPACE LAW.

⁵⁸ *Id.* Chief amongst its complaints was the protest that EarthSat's competitors would be able to continue purchasing the tapes for resale at the 20% discount, thus causing the company to be competitively disadvantaged since it would have to pay the regular price of \$4,400 without being able to pass along any cost savings to the consumer. *Id.* at 4.

⁵⁹ Among its prayers for relief, EarthSat requested that EOSAT be ordered "to reinstate EarthSat as a *Landsat* distributor retroactive to January 1, 1995; . . . to adjust all invoices issued to EarthSat since January 1, 1995, to reflect its 20% distributor discount; . . . to refrain from discriminating in price against EarthSat in the future; . . . to provide the same quality level of tapes, service, and delivery to EarthSat as to its other distributors and customers; [and to pay] EarthSat[s] costs and attorney fees" *Id.* at 5-6.

1. The Robinson-Patman Act

Forty-six years after the adoption of the Sherman Act, Congress passed the Robinson-Patman Act as a means of combating the anticompetitive practice of price discrimination.⁶⁰ Holding that “[i]t shall be unlawful for any person engaged in commerce . . . either directly or indirectly, to discriminate in price between different purchasers of commodities of like grade and quality . . . where the effect of such discrimination may be substantially to lessen competition . . . or to injure, destroy, or prevent competition,” this statute continued the Sherman Act’s theme of imposing criminal sanctions on those found guilty of engaging in the prohibited conduct.⁶¹ As an additional deterrent to any would-be perpetrators, Section Four of the Clayton Act—of which Robinson-Patman is a part—also allowed the injured party to recover treble damages in addition to the cost of the suit and attorneys fees since “Congress has expressed its belief that private antitrust litigation is one of the surest weapons for effective enforcement of the antitrust laws.”⁶²

While the Robinson-Patman Act is certainly powerful, it does not ban “*all* price differences charged to different purchasers of commodities of like grade and quality”⁶³ Rather, the Act proscribes “price discrimination only to the extent that it threatens to injure competition”⁶⁴ As the Supreme Court has held:

Our decisions describe three categories of competitive injury that may give rise to a Robinson-Patman Act claim: primary-line, secondary-line, and tertiary line. Primary-line cases entail conduct—most conspicuously, predatory pricing—that injures competition at the level of the discriminating seller and its direct competitors. . . . Secondary-line cases . . . involve price discrimination that injures competition among the dis-

⁶⁰ 15 U.S.C. § 13 (1936).

⁶¹ *Id.* at § 13(a).

⁶² 15 U.S.C. § 15(a). *Minnesota Min. & Mfg. Co. v. New Jersey Wood Finishing Co.*, 381 U.S. 311, 318 (1965).

⁶³ *Brooke Group Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 220 (1993) (emphasis added).

⁶⁴ *Id.*

criminating seller's customers (here, Volvo's dealerships); cases in this category typically refer to "favored" and "disfavored" purchasers. See *Texaco Inc. v. Hasbrouck*, 496 U.S. 543, 558 n.15 (1990). Tertiary-line cases involve injury to competition at the level of the purchaser's customers.⁶⁵

Given that EOSAT was granted a statutory monopoly over the operation of the *Landsat* system and the marketing and distribution of its data,⁶⁶ EarthSat's price discrimination claim would not fall under the primary-line category since it was not a "direct competitor" of EOSAT. Quoting the Supreme Court once again, however:

To establish [a] secondary-line injury . . . [the claimant must] show that (1) the relevant sales were made in interstate commerce; (2) the [items] were of "like grade and quality"; (3) [the seller] discriminate[d] in price between [the claimant] and another purchaser [of the item]; and (4) "the effect of such discrimination may be . . . to injure, destroy, or prevent competition" to the advantage of a favored purchaser, i.e. one who "receive[d] the benefit of such discrimination."⁶⁷

Seen against this category, EarthSat's claim becomes much more viable since it alleges price discrimination that injured competition among EOSAT's customers, particularly between "favored" and "disfavored" purchasers of *Landsat* data tapes.⁶⁸

Separating the *Volvo Trucks* test for establishing injury under the secondary-line category into its four elements, EarthSat would have needed to prove the following in order to show a valid antitrust claim under the Robinson-Patman Act: (1) the *Landsat* tape sales were made in interstate commerce; (2) the tapes were commodities of like grade and quality; (3) EOSAT discriminated in price between EarthSat and another purchaser of *Landsat* tapes; and (4) the effect of this price discrimination

⁶⁵ *Volvo Trucks North America, Inc. v. Reeder-Simco GMC, Inc.*, 546 U.S. 164, 176 (2006).

⁶⁶ See *supra* note 10.

⁶⁷ 546 U.S. at 176-77 (2006).

⁶⁸ See *supra* note 56.

was to injure, destroy, or prevent competition in the sale of *Landsat* tapes to the advantage of a favored purchaser.⁶⁹

Taking the elements in the order they appear, EOSAT raised a frontal attack against the first premise by arguing that the transfer of the *Landsat* tapes to EarthSat was not even a true sale.⁷⁰ Arguing that under the terms of its agreement EarthSat was a commissioned sales representative and not a distributor or purchaser for resale, EOSAT analogized the situation to the facts of *Students Book Co. v. Washington Law Book Co.* in which the “appellant sued for treble damages for injuries allegedly caused by [the] sales of student law books to . . . competitors at preferential prices and under preferential terms”⁷¹ Before the fall of 1947, the defendant had supplied the plaintiff with books at a discount of twenty percent off the list price, but later decided to substantially reduce this discount while extending even more favorable terms to other area bookstores.⁷² In reviewing the trial court’s decision, Judge Bazelon wrote:

Thus there was a conflict in the evidence from which the jury could have found that the transactions with the campus book stores were either consignments or sales. To enable the jury to resolve this conflict, the court charged, in essence, that if title to the books passed to the campus book stores, they were purchasers, but that if title did not pass to them, they were merely consignment agents. Since the jury’s verdict sustained the defense, it must have found that the transactions were consignments.⁷³

While the difference between a sale and a consignment may appear at first to be one of mere semantics, the distinction is a critical one since “the [Robinson-Patman] Act does not apply to transactions that are not sales.”⁷⁴ In its April 21, 1995 Memorandum of Points and Authorities, EarthSat responded by argu-

⁶⁹ See *supra* note 67.

⁷⁰ EOSAT Mem. of Points and Authorities (Mar. 16, 1995) at 3. On file with the JOURNAL OF SPACE LAW.

⁷¹ 232 F.2d 49, 50 (C.A.D.C. 1955).

⁷² *Id.*

⁷³ *Id.* at 51.

⁷⁴ *Parrish v. Cox*, 586 F.2d 9, 12 (6th Cir. 1978).

ing that “Maryland law, which controls the sale issue in this case and upon which EOSAT relies, requires a factual showing respecting the passage of title; the language of the contract is not enough.”⁷⁵ Looking to Maryland’s enactment of § 2-202 of the Uniform Commercial Code, EarthSat posited that:

terms with respect to which the confirmatory memoranda of the parties agree or which are otherwise set forth in a writing . . . may be explained or supplemented (a) By course of dealing or usage of trade (§ 1-205) or by course of performance (§ 2-208).⁷⁶

Contending that a larger view of the facts surrounding the agreement needed to be considered, EarthSat then cited the case of *Blank v. Dubin*.⁷⁷ Discussing the potential overlap between a principal-agency relationship and a legitimate sale, the court held that:

title remains in the principal, and the factor or agent is liable to pay, not a price, but to account for the proceeds of the goods when sold. If, however, it appears from the whole agreement that it is the intention of the parties that the title to the goods is to pass to the party receiving them, for a price to be paid by him, then the transaction is a sale.⁷⁸

If interpreted as allowing parol evidence to be introduced to show the agreement through the “course of dealing or usage of trade . . . or by course of performance”⁷⁹ was a true sale instead of a consignment, EarthSat’s position would have been greatly bolstered. If the court ruled that such evidence was impermissible, however, EarthSat’s claim would have been severely injured.⁸⁰

⁷⁵ See Mem. of Points and Authorities (Apr. 21, 1995) at 2. On file with the JOURNAL OF SPACE LAW.

⁷⁶ Md. Code Ann., Com. Law § 2-202.

⁷⁷ 267 A.2d 165 (Md. 1970).

⁷⁸ *Id.* at 167.

⁷⁹ See *supra* note 76.

⁸⁰ Since preferences granted to a sales agent are not actionable because there is no sale to the agent, see *United States v. GTE*, 272 U.S. 476 (1926), any suggestion that the contract was for a consignment would defeat the claim.

Turning to the second element of the *Volvo Trucks* test, the Robinson-Patman Act requires the injured party to prove that the alleged price discrimination occurred between purchases of commodities of like grade and quality.⁸¹ In its Counterclaim Against EOSAT,⁸² EarthSat alleged that the “*Landsat* tapes sold to EarthSat and its competitors are commodities of like grade and quality” while EOSAT responded by denying this supposition.⁸³ Although neither party provided case law in support of their respective contentions, the debate over the tapes being “commodities of like grade and quality” is not as superficial as it might appear.⁸⁴

In *May Dept. Store v. Graphic Process Co.*, the court held that “[i]t is necessary for an action under . . . the Robinson-Patman Act that the transactions between the parties constitute a sale of ‘goods, wares, or merchandise’” and not merely the sale of intangible property rights.⁸⁵ As one court has elaborated:

the discriminatory sales must involve “commodities.” Plaintiff’s complaint alleges price discrimination with respect to cable television services. . . . TVCN never made any reference to the sale of a *tangible* commodity [emphasis added]. The court is persuaded that cable television programming is not a commodity; it is a service. This cause of action is not covered [and a]ccordingly, the motions to dismiss [this] claim for relief are hereby granted.⁸⁶

Although EarthSat could have attempted to argue that the *Landsat* tapes themselves were tangible objects and thus “commodities” within the meaning of the Act, this interpretation would likely have encountered some difficulty. In a highly-analogous case, the Supreme Court of Tennessee ruled:

⁸¹ See *supra* note 67.

⁸² See *supra* note 57, at 4.

⁸³ EOSAT’s Reply to Counterclaim (Mar. 16, 1995) at 4. On file with the JOURNAL OF SPACE LAW.

⁸⁴ See *supra* note 69.

⁸⁵ 637 F.2d 1211, 1214 (9th Cir. 1980).

⁸⁶ *TV Communications Network, Inc. v. ESPN, Inc.*, 767 F. Supp. 1062, 1076 (D. Colo. 1991).

What is created and sold here is information, and these magnetic tapes which contain this information are only a method of transmitting these intellectual creations from the originator to the user. It is merely incidental that these *intangibles* [emphasis added] are transmitted by way of a tangible reel of tape that is not even retained by the user.⁸⁷

Even though the technological design aspects of the *Landsat* tapes might support the notion that they are of like grade and quality with one tape being just as functional as any other, recent decisions handed down by two district courts seem poised to deliver the *coup de grâce* to the argument that tapes and the data stored upon them are the same product. In *United States v. Ivanov*, the court ruled that “[stored] data is intangible property”⁸⁸ while the decision in *State Auto Prop. & Cas. Ins. Co. v. Midwest Computers & More* took this even further by holding that “[a]lone, computer data cannot be touched, held, or sensed by the human mind; it has no physical substance. It is not tangible property.”⁸⁹ Referencing back to the Tennessee Court’s ruling:

tangible personal property under these circumstances is merely incidental to the purchase of the intangible knowledge and information stored on the tapes. . . . We hold that the sale of [stored computerized information] does not constitute the sale of tangible personal property⁹⁰

Had EOSAT developed its denial of EarthSat’s allegation further, there is a strong possibility that the acquisition of the *Landsat* tapes would not have been found to involve commodities of like grade and quality.⁹¹

⁸⁷ *Commerce Union Bank v. Tidwell*, 538 S.W.2d 405, 407 (Tenn. 1976).

⁸⁸ 175 F. Supp. 2d 367, 371 (D. Conn. 2001).

⁸⁹ 147 F. Supp. 2d 1113, 1116 (W.D. Okla. 2001).

⁹⁰ See *supra* note 87.

⁹¹ Considering the transaction as a whole, one could readily analogize it to *General Shale Prod. Corp. v. Struck Const. Co.*, 132 F.2d 425 (6th Cir. 1942) in which the sale of a load of bricks (tangible) by a builder who contracted to construct a development (intangible service) was not seen as the dominant aspect of the deal. Rather, the deal’s dominant aspect concerned the acquisition of a particular service—the performance of which simply required the use of a tangible medium.

Combining the third and fourth *Volvo Trucks* secondary-line requirements into a unified discussion, EarthSat would finally have needed to show that EOSAT discriminated in price between it and another purchaser of the *Landsat* tapes with the effect of injuring, destroying, or preventing competition in the sale of those tapes.⁹² Although the Supreme Court has ruled that “price discrimination within the meaning of [this] provision is merely a price difference”⁹³ and EOSAT did not dispute that EarthSat was no longer receiving the discount that other companies were entitled to,⁹⁴ the Supreme Court has also held that this price discrimination might not even matter. In *Brooke Group Ltd. v. Brown & Williamson Tobacco Corp.*, the Court elaborated that:

the statute as a practical matter could not, and does not, ban all differences charged to “different purchasers of commodities of like grade and quality.” Instead, the statute contains a number of important limitations, one of which is central to evaluating [the plaintiff’s] claim: By its terms, the Robinson-Patman Act condemns price discrimination *only to the extent that it injures competition*.⁹⁵

Addressing this point in its Reply Memorandum, EOSAT argued “[t]hat EarthSat is no longer one of those 53 sales representatives has no effect on the quantity of *Landsat* data available for sale or the price of that data, which is set by EOSAT.”⁹⁶ Given the sheer quantity of companies EarthSat competed with, the argument that its removal from a preferential pricing scheme constituted an injury to competition seems at first to ring a bit hollow. As the Third Circuit has interpreted the “effect” requirement of this injury, however:

Section 2(a) specifies three possible consequences of price discrimination which will satisfy its “effects” proviso, i.e., that the

⁹² See *supra* note 67.

⁹³ *Texaco Inc. v. Hasbrouck*, 496 U.S. 543, 558 (1990).

⁹⁴ See *supra* note 70.

⁹⁵ 509 U.S. 209, 220 (1993) (emphasis added).

⁹⁶ EOSAT’s Reply Memorandum in Support of its Motion for Summary Judgment (Apr. 28, 1995) at 11. On file with the JOURNAL OF SPACE LAW.

discrimination in price had an adverse “effect” on competition. Although . . . the first two of these effects refer specifically to discriminatory practices which lessen competition or tend towards monopoly, . . . the third makes price discrimination illegal *where it adversely affects the ability of individual companies to compete*. Thus, section 2(a) makes it unlawful to discriminate in price where “the effect may be . . . to injure, destroy or prevent competition *with any person . . .*” The language of the statute reflects concern both for the preservation of competition and for the protection of individual competitors. . . . The legislative history as well indicates that one of the factors leading to the 1936 amendment of the Clayton Act was the perception that the 1914 version, containing only the first two conditions, was concerned exclusively with injury to competition.⁹⁷

Stated more succinctly, “[w]hat must be proven then is that [the defendant] violated the Robinson-Patman Act and that [the plaintiff] was, as a consequence, injured in *its* business.”⁹⁸

Concurring with this result seven years later, the Ninth Circuit in *Chroma Lighting v. GTE Products Corp.* elaborated on the validity of expanding the injury concept to include damages to individual competitors:

In *FTC v. Morton Salt*, 334 U.S. 37 (1948), the [Supreme] Court held that competitive injury in a secondary-line Robinson-Patman case may be inferred from evidence of injury to an individual competitor. More specifically, *Morton Salt* permits a factfinder to infer injury to competition from evidence of a substantial price difference over time, because such a price difference may harm the competitive opportunities of individual merchants, and thus create a “reasonable possibility” that competition itself may be harmed. . . . The question presented by Sylvania’s appeal is whether the inference of competitive injury that arises from a showing of harm to an individual competitor in a secondary-line price discrimination case may be overcome by a showing that competition in the relevant market remains healthy. This question was left open by *Morton*

⁹⁷ J.F. Feeser, Inc. v. Serv-A-Portion, Inc., 909 F.2d 1524, 1532 (3d Cir. 1990) (emphasis added).

⁹⁸ *Id.* (emphasis added).

Salt, and the circuits are divided on the issue. The D.C. Circuit, for example, has held that the inference of competitive injury may be rebutted by a showing of no actual harm to competition because the Robinson-Patman Act must be construed in light of the pro-competitive purpose of all other antitrust litigation. *Boise Cascade Corp. v. FTC*, 837 F.2d 1127, 1144 (D.C. Cir. 1988). The Third Circuit, on the other hand, has held that the inference of competitive injury may not be overcome by evidence of no harm to competition because the Robinson-Patman Act was designed specifically to protect individual competitors rather than competition in general. . . . We agree with Von Der Ahe and the Third Circuit, and affirm the jury verdict for Von Der Ahe on the Robinson-Patman claim.⁹⁹

Given the Supreme Court's ruling that competitive injury may be inferred from evidence of injury to an *individual competitor* and the determination by two influential Courts of Appeal that this inference may not be overcome by evidence of relative market health,¹⁰⁰ EarthSat would likely have been able to prove the final *Volvo Trucks* requirement of competitive injury. While this component would likely have been met, however, EarthSat would also have needed to prove that it was *sold* the *Landsat* tapes in interstate commerce and that these tapes were *commodities* of like grade and quality.¹⁰¹ Absent a showing of all four elements, its claim would have failed.

In the event EarthSat could have demonstrated each of the four elements required under *Volvo Trucks*, there is still one final hurdle that would have likely proven insurmountable. As the Supreme Court ruled in *Brooke Group Ltd.*:

whether the claim alleges predatory pricing under § 2 of the Sherman Act or . . . price discrimination under the Robinson-Patman Act, two prerequisites to recovery remain the same. First, a plaintiff seeking to establish competitive injury resulting from a rival's low prices must prove that the prices complained of are below an appropriate measure of its rival's costs . . . only below-cost prices should suffice, and we have rejected

⁹⁹ 111 F.3d 654-55 (9th Cir. 1997).

¹⁰⁰ *Id.*

¹⁰¹ See *supra* note 67.

elsewhere the notion that above-cost prices that are below general market levels or the costs of a firm's competitors inflict injury to competition cognizable under the antitrust laws. . . . The second prerequisite to holding a competitor liable under the antitrust laws for charging low prices is a demonstration that the competitor had a reasonable prospect, or, under § 2 of the Sherman Act, a dangerous probability, of recouping its investment in below-cost prices.¹⁰²

While there is no information in the filings revealing EOSAT's Cost of Goods Sold or any other "appropriate measure" of its expenses, it seems unlikely that EarthSat would have been able to prove that the fifty-three other sales representatives with whom EOSAT did business were receiving the *Landsat* data tapes at a below-cost price.¹⁰³ A discount of ten or twenty percent might have been significant given the particular product being sold, but it is doubtful that this price reduction would have been substantial enough to drive the price below an appropriate measure of cost.

Furthermore, given that EOSAT occupied a federally-supported monopoly position through its sole source contract, EarthSat could not have been considered a "rival" of the company simply because there was never any competition in the *Landsat* market. Had EarthSat operated a competing satellite system—with EOSAT offering its *Landsat* services at below some appropriate measure of cost—there is a much stronger argument that EarthSat would have been able to prove it was a "rival" of EOSAT and thus a party able to have suffered injury from predatory pricing. As it stands, however, EarthSat did not even demonstrate that the price discount received by the other

¹⁰² See *supra* note 95, at 222-24.

¹⁰³ See *supra* note 96. The tactical validity of this argument would also be questionable given that EarthSat was the recipient of this price discount for many years. To the extent EarthSat could have ever managed to prove that EOSAT was engaging in below-cost pricing, it would have been a willing beneficiary of this practice and would thus have become enriched at the expense of any other company which was not receiving the price discount. While it is highly doubtful that EarthSat could have ever demonstrated any below-cost pricing on EOSAT's part, in the event it was able to demonstrate this, it could have opened itself up to criticism for willingly accepting the discount for so many years and then hypocritically attacking the same discount's validity when it was no longer a recipient.

distributors was anything other than above-cost; thus this first *Brooke Group Ltd.* requirement is not met.

Turning to the decision's second requirement, EarthSat would also have needed to demonstrate that EOSAT "had a reasonable prospect, or, under § 2 of the Sherman Act, a dangerous probability, of recouping its investment in below-cost prices."¹⁰⁴ As the Supreme Court explained in *Matsushita Elec. Industrial Co. v. Zenith Radio Corp.*, "[f]or the investment [in below-cost pricing] to be rational, [EOSAT] must have a reasonable expectation of recovering, in the form of later monopoly profits, more than the loss suffered."¹⁰⁵ For EOSAT to have offered a discount that would have caused it to experience a loss on each tape sold would have been economically irrational since it *already* occupied a monopoly position and thus would never have needed to reduce prices in the first place. In light of EarthSat's failure to demonstrate that EOSAT was selling its tapes to the other distributors at below cost, this second requirement of a recoupment showing would not have even arisen. As the *Brooke Group Ltd.* decision held, "[i]f market circumstances or deficiencies in proof would bar a reasonable jury from finding that the scheme alleged would likely result in sustained supracompetitive pricing, the plaintiff's case has failed."¹⁰⁶

2. Refusal to Deal

Although largely subsumed by the price discrimination claim, a final issue which EarthSat could have argued concerns EOSAT's refusal to deal with it on terms similar to those offered to other companies—namely, the lack of the twenty-percent discount or commission. To the extent a court would have found the absence of this discount to be economically discriminatory, the Robinson-Patman Act would provide an avenue of redress. Section Two of the Sherman Act, however, also "prohibits a monopolist's unilateral action, like [the] refusal to deal, if that con-

¹⁰⁴ See *supra* note 96, at 224.

¹⁰⁵ 475 U.S. 574, 588-89 (1986).

¹⁰⁶ See *supra* note 96, at 226.

duct harms the competitive process in the absence of a legitimate business justification.”¹⁰⁷

In *Monsanto Co. v. Spray-Rite Service Corp.*, the Supreme Court observed that a business “generally has a right to deal, or refuse to deal, with whomever it likes, as long as it does so independently.”¹⁰⁸ In a similar case decided one year later, the Court elaborated that “the long recognized right . . . [to] freely exercise [one’s] own independent discretion as to parties with whom [it] will deal” did not automatically violate the Sherman Act,¹⁰⁹ but that in viewing the totality of the defendant’s actions, it was exclusionary—and thereby anticompetitive—for the monopolist to unilaterally refuse to continue a “pattern of distribution that had originated in a competitive market and had persisted for several years.”¹¹⁰ Unlike the showing of an injury to an *individual* competitor embraced in the price discrimination context, however,¹¹¹ “in determining whether conduct is exclusionary in the context of a [section two] claim, [the court] ordinarily focus[es] on harm to the competitive process”¹¹²

It is unclear from the parties’ motions and filings to just what extent EOSAT’s refusal to deal with EarthSat as a party entitled to the standard twenty-percent discount could have constituted a harm to the overall “competitive process” or market for *Landsat* data tapes. In the event this could even have been quantified, however, EOSAT could have easily argued that “the pattern of distribution that had originated in a competitive market and had persisted for several years”¹¹³ still contained over fifty different sales representatives¹¹⁴ and that EarthSat’s exclusion from this preferential cost scheme did not unduly prejudice the end consumer. Additionally, both parties agreed in their supporting motions that EarthSat was still entitled to

¹⁰⁷ *Image Technical Services, Inc. v. Eastman Kodak Co.*, 125 F.3d 1195 (9th Cir. 1997).

¹⁰⁸ 465 U.S. 752, 761 (1984).

¹⁰⁹ *Aspen Skiing Co. v. Aspen Highlands Skiing Co.*, 472 U.S. 585, 602 (1985).

¹¹⁰ *Id.* at 603.

¹¹¹ *See supra* note 99.

¹¹² *Data General Corp. v. Grumman Systems Support Corp.*, 36 F.3d 1147, 1185 (1st Cir. 1994).

¹¹³ *See supra* note 110.

¹¹⁴ *See supra* note 96.

purchase *Landsat* tapes, albeit without the price discount,¹¹⁵ so the argument could also be raised that EOSAT did not in fact refuse to “deal” with EarthSat, but merely refused to deal with it on such previously favorable terms. Quoting *Volvo Trucks* again, the antitrust laws do not “ban all price differences”¹¹⁶ and under *Monsanto Co.*, a business generally can “deal, or refuse to deal, with whomever it likes, as long as it does so independently.”¹¹⁷

CONCLUSION

The world has changed a considerable amount since D. M. Mickey wrote his article on trusts in the 1888 *American Law Review*. Although we may no longer fear the power of the upholsterer’s felt trust or the lead-pencil and coffin cartels,¹¹⁸ the economic realities of the Twenty-First Century bring their own challenges for us to consider. With the rise of a global economy more connected than ever before and the increasing political demands on the treasuries of most Nation-States, the privatization of formerly public areas of government policy offers one solution to the challenging realities of fiscal scarcity. In the Seventeenth-Century Netherlands, the decision was made to grant a monopoly to a private corporation so that national and economic power might be expanded across the world.¹¹⁹ Three hundred and eighty-two years later, the United States made a similar decision to privatize part of its remote sensing policy through the grant of a sole-source contract to EOSAT for the operation of the *Landsat* system.¹²⁰

¹¹⁵ See *supra* note 59.

¹¹⁶ 546 U.S. at 176.

¹¹⁷ See *supra* note 108.

¹¹⁸ See *supra* note 40, at 540.

¹¹⁹ See *supra* note 2.

¹²⁰ See *supra* note 10. Although this privatization was short-lived, the fact that it occurred at all illustrates the *Landsat* program’s importance to U.S. remote sensing efforts since Congress could have easily voted during the 1980s to not continue funding. Even though “[t]he Office of Science and Technology (“OSTP”) eliminated the . . . option for a public-private partnership due to ‘the lack of viable commercial markets for *Landsat* data’ the importance of *Landsat* data continuity also caused the OSTP to “announce[] further that the Government will ‘transition the *Landsat* program from a series of independently planned missions to a sustained operational program”

Even though it ultimately settled out of court, the dispute between EOSAT and EarthSat offers a unique perspective on the prospective antitrust liability of a federally-supported monopoly. Although Congress through the Sherman Act has clearly established its general disdain for monopolistic entities,¹²¹ it has also demonstrated that certain monopolies are permissible and even necessary to advance the national well-being.¹²² From the Private Express Statutes granting the Postal Service its monopoly over the carriage of letters to the Atomic Energy Act's sweeping revocation of patents and intellectual property rights on fissionable technology, certain institutional functions have historically been deemed important enough to warrant monopoly protection. Given the statutory phrasing and political rationale behind the Land Remote Sensing Policy Act and the earlier Commercialization Act of 1984, EOSAT's sole-source *Landsat* contract would almost certainly have been found to be a similarly-important federally-supported monopoly.

Despite this protected monopoly or sole-source status, however, there is an argument that EOSAT could have been found guilty of engaging in certain anticompetitive conduct. Unlike an agency of the U.S. Government needing to utilize fission technology patented prior to the 1946 Atomic Energy Act, EOSAT was a completely private entity—albeit an entity empowered to fulfill a formerly-sovereign function. This distinction is a critical one since, for example:

the Postal Service [has] a high degree of independence from other offices of the Government, but it remains part of the Government. The Sherman Act defines “person” to include corporations, and had the Congress chosen to create the Postal Service as a federal corporation, we would have to ask whether the Sherman Act's definition extends to the federal entity under this part of the definitional text. Congress, however, de-

Gabrynowicz, *supra* note 10, 6 CHI. J. INT'L L. at 60-61. Despite the early political desire to fully commercialize the *Landsat* program, fiscal reality ultimately dictated that a federally-supported monopoly grant be used until the program could be re-grafted into the public sector under a definitive mission structure.

¹²¹ See *supra* note 45.

¹²² See *supra* note 46.

clined to create the Postal Service as a Government corporation, opting instead for an independent establishment.¹²³

Given that the aforementioned language of *Flamingo Industries* suggests that even a *federally-created* corporation might be subject to the Sherman Act's reach, there seems to be little question that it would certainly extend to a private corporation holding a sole-source contract.

Although there is little doubt that a private corporation like EOSAT holding a federal contract could be subject to the anti-trust laws, the question still remains of what remedy EarthSat would have been entitled to receive. Under the *Volvo Trucks* test, EarthSat would have still needed to prove each of the four elements in order to demonstrate that EOSAT had engaged in secondary-line discrimination, and as previously mentioned in the analysis, on at least two of those points it would have faced a sizeable amount of difficulty. On top of this difficulty, EarthSat would also have needed to prove that EOSAT sold its products to the other distributors below an appropriate measure of cost, and given the lack of inquiry into this specific area—or similar mention in the pleadings for that matter—this is likely doubtful. Although EarthSat could have raised a refusal to deal claim as part of its attack on EOSAT's pricing scheme, the potential success of this strategy seems questionable at best given that EOSAT was still "dealing with" the company; it simply was not extending the full set of terms it offered to others. Thus, although this case suggests that a private concern is not immune from antitrust liability simply by virtue of being a federally-supported monopoly, the facts of this particular matter suggest that had it proceeded to trial, EOSAT would have prevailed.

¹²³ U.S. Postal Service v. Flamingo Industries (USA) Ltd., 540 U.S. 736, 746 (2004).

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