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UNIVERSITY OF MISSISSIPPI SCHOOL OF LAW  
A JOURNAL DEVOTED TO SPACE LAW AND THE LEGAL PROBLEMS  
ARISING OUT OF HUMAN ACTIVITIES IN OUTER SPACE.

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## FOREWORD

### SPACE LAW: SOMETHING FOR EVERYONE

*Joanne Irene Gabrynowicz*<sup>1</sup>

Space activities and the categories of space actors are growing, expanding, and changing. Unsurprisingly, so are the laws that regulate them. Ranging from national and international security to space tourism, this issue of the JOURNAL OF SPACE LAW contains articles that document these trends with a wide variety of topics and authors.

The national security aspects of space law are presented by R. Cargill Hall and K.K. Nair. Mr. Hall takes a long look back at the interrelationship between U.S. law and national security space policy in his article, *The Evolution of U. S. National Security Space Policy and its Legal Foundations in the 20th Century*. This article is of particular interest to those interested in how the law shapes, or fails to shape, policy decisions. The subject of K.K. Nair's commentary, *China's ASAT Test: A Demonstrated Need for Legal Reform*, also addresses security but he addresses a most recent event and takes a look at it from the international

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<sup>1</sup> 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, is a Director of the International Institute of Space Law, and is a member of the American Bar Association Forum on Air and Space Law.

level. Nair's views include some new and challenging ideas for the space community.

The continuing emergence of space legislation at the national level and the effects of international space law on national legislation are also described in this issue. Yoon Lee takes the case of Korea in his article, *A Review of the Space Development Promotion Act of the Republic of Korea*. This article illustrates a prime example of the Globalization Era wave of national space law. Susan Trepczynski also considers national space laws but within the context of the relationship between them and the international treaty regime in her article, *The Effect of the Liability Convention on National Space Legislation*.

The world's newest space activity, personal space flight—also referred to as space tourism—is well represented in this issue. This issue's student paper is by Charles W. Stotler who also writes about the relationship between national and international law. He takes a broad look at this new arena of space travel in his paper, *International and U.S. National Laws Affecting Commercial Space Tourism: How ITAR Tips the Balance Struck Between International Law and the CSLAA*. In contrast to this approach, Tracey Knutson—a practitioner whose primary practice involves working with recreation and adventure sports commercial operators—gets down to the specifics. Her article addresses the most basic legal question the new industry faces when she asks, *What is "Informed Consent" for Space-Flight Participants in the Soon-To-Launch Space Tourism Industry?*

Science, technology, law, evidence, and litigation come together in *Certification of Digital Data: The Earth Resources Observation and Science Data Center Project*, by Ronald J. Rychlak, Joanne Irene Gabrynowicz, and Rick Crowsey. This article shows how the law of evidence applies to the practices of the U.S. Department of Interior/U.S. Geological Survey Earth Resources Observation and Science Data Center in providing digital aerial and satellite imagery for use in U.S. court proceedings. The project reported in the article resulted in a formal certification procedure that allows imagery to be introduced into a legal proceeding under the U.S. Federal law of evidence.

This issue of the JOURNAL OF SPACE LAW continues its practice of providing up-to-date information on space law developments. It contains its on-going bibliography, Space Law and Relevant Publications, by Macey Edmondson. It also provides an English text of the *European Cooperating State Agreement between the European Space Agency and the Government of the Republic of Poland*.

National, international, security, commercial, litigation, regulation, certification—it's all in this issue of the JOURNAL OF SPACE LAW, providing something for everyone.

# CALL FOR PAPERS

## JOURNAL OF SPACE LAW UNIVERSITY OF MISSISSIPPI SCHOOL OF LAW

A JOURNAL DEVOTED TO SPACE LAW AND THE LEGAL PROBLEMS ARISING  
OUT OF HUMAN ACTIVITIES IN OUTER SPACE.

### Volume 33, Issue 2

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 33, issue 2 of the *JOURNAL OF SPACE LAW* in the second half of 2007.

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.

Please email manuscripts and accompanying abstracts in Microsoft Word or WordPerfect to:

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Or, alternatively, a hardcopy of the manuscript and abstract, along with a computer diskette containing them in Microsoft Word or WordPerfect format may be sent to:

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To be considered for the next issue, submissions should be received on or before November 15, 2007. The *JOURNAL OF SPACE LAW* will continue to accept and review submissions on an on-going basis.

# ARTICLES

## THE EVOLUTION OF U.S. NATIONAL SECURITY SPACE POLICY AND ITS LEGAL FOUNDATIONS IN THE 20<sup>TH</sup> CENTURY

*R. Cargill Hall\**

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\* Emeritus Chief Historian, National Reconnaissance Office (an intelligence arm of the Department of Defense). During a 42 year career, Hall served as a historian for the Central Intelligence Agency, Department of the Air Force, and NASA. He is the author/editor of a number of books and articles on the history of aeronautics, astronautics, space law, and national space policy.

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## PREFACE

National space policy derives from presidential directives issued through the National Security Council (NSC), Public Law,<sup>1</sup> presidential policy declarations,<sup>2</sup> and international conventions.<sup>3</sup> Of these four key sources, however, only the important first category remains largely unavailable to public scrutiny. In fact, because of their potential international political ramifications, between the issuance of the first NSC Directive in 1955 and for at least ten years thereafter, these classified space policies were so closely held that only a few political leaders and government officials knew of or had access to them. Absent that access, military leaders planning space operations and formulat-

<sup>1</sup> For example, the National Aeronautics and Space Act of 1958, Pub. L. No. 85-568, 72 Stat. 426 (2007).

<sup>2</sup> President Dwight Eisenhower's announcement of an American scientific satellite program as a part of the International Geophysical Year is illustrative of this category. (The White House, Immediate Release, "Statement by James C. Hagerty," 29 July 1955, Eisenhower Library).

<sup>3</sup> UN-generated treaties and arms control treaties, such as the 1967 Outer Space Treaty and the 1972 SALT I and ABM conventions to which the U.S. is a signatory, become public law and national space policy. *See e.g.*, 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.

ing military space doctrine often operated at cross-purposes to official policy. Indeed, in the early 1960s, military space planning was at such a variance with national space policy that Secretary of Defense Robert McNamara, acting for President John F. Kennedy, terminated two Air Force space programs that the service's military leaders considered vital to national security.<sup>4</sup> Part of the disparity between national space policy and defense desires in space at that time unquestionably resulted from the President's decision not to share space policy details outside a small circle. Those details involved a U.S. strategy to establish in the international arena the legality of strategic reconnaissance conducted from outer space. But whatever the reasons for the military disconnection, enormous amounts of time, effort, and money had simply to be written off.

In 1986, I agreed to research and write for the National Reconnaissance Office a history of Air Force participation in the military and national intelligence space programs. This work, finished in the summer of 1988, covered all of the space missions in which the service had participated except for the communication and navigation satellite programs, programs that were more readily available in the open literature. The study was intended to provide Air Force officers, at the Sensitive Intelligence Talent Keyhole (SITK) level, an overview of the origins and evolution of military astronautics. In the conduct of research for that study it became apparent to me that the entire enterprise had been largely shaped by classified presidential space policy directives issued through the National Security Council. Although I succeeded in identifying most, if not all, of the key directives, I did not find an entire set of them anywhere in the government—not in the Office of the Secretary of the Air Force, not in the Central Intelligence Agency, not in the Na-

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<sup>4</sup> Probably the best single survey of these events is Roy F. Houchin, *Hypersonic Technology and Aerospace Doctrine*, in AIR POWER HISTORY 5-10 (Fall 1999). For a concise view of President Kennedy's advisors' thinking on this subject, see "Conclusions" contained in a prescient report prepared at the President's direction by a small NSC working group, Raymond L. Garthoff (Chairman), *National Security Policy Planning Paper: Implications of Outer Space in the 1970s (Planning Task I)* JFK Library MDR Case 03-130e, Document 16 (1962/1963). See also NSC Action 2454, *infra* "Kennedy Directives", §6.

tional Reconnaissance Office, and not even in the National Security Council, which had released them to the respective presidential libraries thus depriving White House officials of a complete accounting.<sup>5</sup> With the assistance of a few people in 1986-87, most particularly Colonel William A. Davidson (SAF/AA) to whom I remain indebted, a set of the known NSC space policy directives was assembled in the Office of the Secretary of the Air Force. I first prepared a historical survey of those NSC directives in the spring of 1988 at the request of Colonel Theodore Schroeder and Major General Harold Todd of the Air War College at Maxwell Air Force Base, to assist in a “blue ribbon” study of national space policy.

This current revision builds upon that historical survey and includes two additional NSC directives prepared for President Lyndon Johnson and two others prepared for President Gerald Ford, which were unknown to me in 1988, and it updates the series from the Carter Administration (1977-81) through the Clinton Administration (1992-2001). This study consists of an introduction that attempts to place presidential space policy directives in historical perspective, and a précis of each directive that contains unclassified extracts of those portions I believe to be most important and that affected most directly the military and intelligence space missions. A conclusion, which briefly assesses these presidential space policy directives and their evolution, concludes the survey. Because my perception of what is “most important” in national security space affairs may not necessarily match yours, readers in government service are advised to consult the original directives and ancillary NSC directives when planning military space doctrine, future military space operations, or recommending revised national space policy.

In editing this study for publication in the open literature, I must recognize a “first mortgage debt” to Stephen R. Hill, Global Analytics, Inc., for his crucial assistance. In early 2006

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<sup>5</sup> The absence of a complete set of national space policy directives in the Offices of the Secretary/Under Secretary of the Air Force implied that the service's prior planning of military space operations—and the doctrine that flows from it—took place in a partial vacuum, without knowledge of prior, key NSC prescriptions and precedent. (In 1986 the U.S. Air Force held only the most recent Reagan and Carter NSC directives at the Pentagon.)

the National Security Council and the National Reconnaissance Office reviewed the result of our editing effort and found the excerpts cited here to be unclassified. N.B. Although many of the early presidential space policy directives are unclassified and available on the internet, many others, especially the more recent ones after 1973, remain classified in their entirety. Each of these directives is on file in its respective presidential library. Readers without the requisite security clearances can obtain a redacted (unclassified) copy by requesting it from a presidential library under a Mandatory Declassification Review. Those portions currently cleared for public release appear in the pages that follow.

#### INTRODUCTION

Of all the Presidents who have taken an active role in formulating national space policy, four stand out: Dwight D. Eisenhower, John F. Kennedy, Jimmy Carter, and Ronald Reagan. Of these, Eisenhower remains the most significant because he framed the U.S. space policy edifice. His successors either embraced the Eisenhower design or, at most, refined it by adding a window here and a door there. Only one of them, President Reagan, proposed a fundamental alteration to the policy structure by embracing the placement of weapons *in space*—an alteration in a traditional prescription that immediately became a point of political contention. Twenty-one years later, in the fifth year of the 21<sup>st</sup> century, agreement on space-based weapons by both the executive *and* legislative branches of the government remains unsecured.

President Dwight D. Eisenhower, who had supervised the destruction of the European axis powers in World War II, knew first-hand the social, political, and economic consequences of total war. Moreover, Pearl Harbor had been etched in his psyche, and in the psyche of other leaders of that era, in a way contemporary authorities might find hard to imagine. When he was inaugurated as the 34<sup>th</sup> President of the United States in January 1953, the Soviet Union, then publicly committed to the destruction of the western democracies, had acquired atomic weapons and TU-4 long range bombers needed to deliver them.

A surprise attack against Western Europe and America with nuclear or thermonuclear weapons would be devastating.

To secure advance warning of an impending attack, the President needed *reliable* intelligence of Soviet actions and military preparations. (The United States, Eisenhower firmly believed, could not afford to prepare militarily for every possible contingency without becoming a “garrison state.”) Meanwhile, Eisenhower’s military commanders, acting on the scantiest of evidence, called for more military hardware simply to match what they believed the Soviets possessed. (You will recall the claims of “a bomber gap” that Air Force leaders embraced publicly in the mid-1950s.) Within a year of assuming office, in early 1954 Eisenhower authorized clandestine peacetime overflights of the Soviet Union with modified military airplanes to assay its strategic forces and nuclear facilities. He continued these covert missions with specially designed, high altitude U-2 airplanes beginning in 1956, and finally with reconnaissance satellites that operated in outer space, above sovereign airspace, in 1959-60. By the end of his second term in office the most pressing intelligence problem had been solved. The result is known collectively today as the National Reconnaissance Program (NRP). His decisions, especially those made between July 1960 and January 1961, put in place virtually everything associated with the subsequent NRP—its intelligence components, their organization and authorities, the access and security control systems, and funding—by the time President Kennedy assumed office.<sup>6</sup>

Most of President Eisenhower’s diplomatic initiatives and his decisions for organizing and conducting U.S. space affairs can be understood as they relate to his predominant concern with reducing the threat of nuclear war. Seeking formal international acceptance of overhead reconnaissance at a Geneva summit conference in July 1955, the President proposed that the Soviet Union and the United States provide facilities for free

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<sup>6</sup> See R. Cargill Hall, *Clandestine Victory: Dwight D. Eisenhower and Overhead Reconnaissance in the Cold War*, in *FORGING THE SHIELD: EISENHOWER AND NATIONAL SECURITY FOR THE 21ST CENTURY* (Dennis Showalter, ed., Chicago: Imprint Publications, 2005).

and open aerial inspection of the opposite country. But the intelligence data to be acquired in this manner cuts two ways: it provides indications and warning, *and* it fattens target folders. The Soviets, well aware of ongoing American military overflights, rejected his offer as a targeting activity. Directly after his return from Geneva to Washington, D.C., Eisenhower, acting through his press assistant, announced that the United States would launch a scientific earth satellite as part of the International Geophysical Year (IGY). Following hard on the heels of his "Open Skies" proposal, his public announcement was no coincidence.

Aerial overflight of another state without its permission remained then, as now, illegal in peacetime under international conventions to which the U.S. is a contracting party. (Eisenhower himself viewed unauthorized aerial overflight to be an extremely grave violation of national sovereignty.) But an earth satellite operating at altitudes above a nation's "air space" would transit numerous states as it circuted the globe. If these states did not protest its passage overhead, the precedent "freedom space," that is, free access to and unimpeded passage through outer space, might be established in international law. That legal precedent, its crafters reasoned, would comport closely with a key principle in maritime law that accorded naval vessels outside coastal waters the right to navigate freely on the "high seas." When the Soviet Union surprised the world by launching the first IGY scientific satellite in October 1957, this precedent was tentatively established. "They did us a good turn," Donald A. Quarles, a key Pentagon advisor, confided to Eisenhower.<sup>7</sup> Shortly thereafter the President, Quarles, and other confidants carefully crafted the National Aeronautics and Space Act to maintain that precedent. Military space flight, left to the Defense Department, would be confined to military support missions—non-aggressive communications or reconnaissance satellites that lodged firmly within a realm that Eisenhower called "peaceful uses of outer space." He judged unac-

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<sup>7</sup> WALTER A. MCDUGALL, *THE HEAVENS AND THE EARTH: A POLITICAL HISTORY OF THE SPACE AGE* 134 (New York: Basic Books, Inc., 1985).

ceptable any military space mission that threatened the precedent of unimpeded overflight in outer space.

When the nations of the world accepted the flight of earth satellites over their sovereign territory during the IGY and immediately thereafter, President Eisenhower's hoped for precedent freedom of space became firmly established. Indeed, by 1972 reconnaissance from space had been embraced and recognized in treaty law. Embodied in the SALT I convention, the High Contracting Powers pledged not to interfere with the "national technical means" of verification that policed its terms. By that date, these remarkable overhead technical systems provided the strategic "transparency" that a prescient leader had sought; they helped ensure that the Cold War remained "cold." Although these later developments did not occur in his lifetime, on leaving office in 1961 Eisenhower surely could take satisfaction in the knowledge that he and his closest advisors had engineered a revolution in intelligence. Together, within the span of eight years, they had opened the Soviet Union and Communist China—indeed the world—to American scrutiny.

President John F. Kennedy, who succeeded Eisenhower, had campaigned on increasing America's military strength, and had ridden into office in part on the charge of "a missile gap" that did not exist. Once briefed on overhead reconnaissance, he embraced Eisenhower's national space policy. By 1961-1962 the intelligence product of his NRP had become so valuable that Kennedy ordered all official discussion of the subject "blacked-out," and, later, cancelled two Air Force space systems that could be viewed as weapons that might jeopardize space reconnaissance: DynaSoar and the Satellite Interceptor, or SAINT as it was known. Air Force military leaders who had welcomed Kennedy to the White House, but who failed to understand what the expression "peaceful uses of outer space" really represented, were mystified and dismayed.<sup>8</sup> Because space reconnaissance had become vital to fashioning U.S. defense, diplomatic,

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<sup>8</sup> For the aspirations and expectations of USAF civilian and military leaders in 1961-62, before and after their hopes were dashed, see DAVID SPIRES, *BEYOND HORIZONS: A HALF CENTURY OF AIR FORCE SPACE LEADERSHIP* 101-112, 124 (Washington DC: U.S. Government Printing Office, 1997).

and economic strategies, however, Kennedy and his successors remained committed to the proposition that *every nation shared a right to overflight in outer space and to all strategic and tactical intelligence acquired while operating in that domain.*

This review considers the Presidents' NSC policy directives in the twentieth century as they relate to the military and intelligence space missions. The reader is again reminded that national space policy is comprised of numerous sources. They are identified in the Preface and include presidential policy declarations, which frequently require Congressional affirmation to execute. For example, President Kennedy approved Project Apollo in 1961, President Johnson approved the Skylab Project in 1967, President Nixon approved the Shuttle-based Space Transportation System in 1972, and President Reagan approved what is known today as the International Space Station in 1984. And in each instance Congress endorsed the ventures. These important public policy decisions set the nation's civil space agency firmly on a course that emphasized manned space flight before robotic space flight. That choice is still debated and its long-term consequences and outcome is not at all clear. Consult *all* of the sources if you seek to understand national space policy in *all* space sectors: civil, military, intelligence, commercial, and launch support.

#### EISENHOWER DIRECTIVES

1. NSC 5520, 20 May 1955, *Statement of Policy on U.S. Scientific Satellite Program*. Crafted by Donald A. Quarles, then Assistant Secretary of Defense for Research and Development, the National Security Council (NSC) endorsed this first United States space policy directive on 26 May 1955, and the President approved it the next day.<sup>9</sup> It authorized a scientific satellite program during the International Geophysical Year (IGY) in 1957-58 as a technical precursor for intelligence satellites, intended

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<sup>9</sup> Date of signature. See XI, FOREIGN RELATIONS OF THE UNITED STATES, 1955-1957, 733, at entry 341 (United Nations and General International Matters) (John P. Glennon, ed., Washington DC: U.S. Government Printing Office, 1988).

to establish the principle in international law of "Freedom of Space."

1. The U.S. is believed to have the technical capability to establish successfully a small scientific satellite of the earth in the fairly near future. Recent studies by the Department of Defense have indicated that a small scientific satellite weighing 5 to 10 pounds can be launched into an orbit about the earth using adaptations of existing rocket components. If a decision to embark on such a program is made promptly, the U.S. will probably be able to establish and track such a satellite within the period 1957-58.

2. The report of the Technological Capabilities Panel of the President's Science Advisory Committee recommended that intelligence applications warrant an immediate program leading to a very small satellite in orbit around the earth, and that re-examination should be made of the principles or practices of international law with regard to "Freedom of Space" from the standpoint of recent advances in weapon technology.

\* \* \* \* \*

5. From a military standpoint, the Joint Chiefs of Staff have stated their belief that intelligence applications strongly warrant the construction of a large surveillance satellite. While a small scientific satellite cannot carry surveillance equipment and therefore will have no direct intelligence potential, it does represent a technological step toward the achievement of the large surveillance satellite, and will be helpful to this end so long as the small scientific satellite program does not impede development of the large surveillance satellite.

6. Considerable prestige and psychological benefits will accrue to the nation which first is successful in launching a satellite. The inference of such a demonstration of advanced technology and its unmistakable relationship to intercontinental ballistic missile technology might have

important repercussions on the political determination of free world countries to resist Communist threats, especially if the USSR were to be the first to establish a satellite. Furthermore, a small scientific satellite will prove a test of the principle of "Freedom of Space." The implications of this principle are being studied within the Executive Branch. However, preliminary studies indicate that there is no obstacle under international law to the launching of such a satellite.

7. It should be emphasized that a satellite would constitute no active military offensive threat to any country over which it might pass. Although a large satellite might conceivably serve to launch a guided missile at a ground target, it will always be a poor choice for that purpose. A bomb could not be dropped from a satellite on a target below, because anything dropped from a satellite would simply continue alongside in the orbit.

8. The U.S. is actively collaborating in many scientific programs for the International Geophysical Year (IGY), July 1957 through December 1958. The U.S. National Committee of the IGY has requested U.S. Government support for the establishment of a scientific satellite during the Geophysical Year. The IGY affords an excellent opportunity to mesh a scientific satellite program with the cooperative world-wide geophysical observational program. The U.S. can simultaneously exploit its probable technological capability for launching a small scientific satellite to multiply and enhance the over-all benefits of the International Geophysical Year, to gain scientific prestige, and to benefit research and development in the fields of military weapons systems and intelligence. The U.S. should emphasize the peaceful purposes of the launching of such a satellite, although care must be taken as the project advances not to prejudice U.S. freedom of action (1) to proceed outside the IGY should difficulties arise in the IGY procedure, or (2) to continue with its military satellite programs directed toward the

launching of a large surveillance-type satellite when feasible.

\* \* \* \* \*

#### Courses of Action

11. Initiate a program in the Department of Defense to develop the capability of launching a small scientific satellite by 1958, with the understanding that this program will not prejudice continued research directed toward large instrumented satellites for additional research and intelligence purposes, or materially delay other major Defense programs.

12. Endeavor to launch a small scientific satellite under international auspices, such as the International Geophysical Year, in order to emphasize its peaceful purposes, provided such international auspices are arranged in a manner which:

- a. Preserves U.S. freedom of action in the field of satellites and related programs.
- b. Does not delay or otherwise impede the U.S. satellite program and related research and development programs.
- c. Protects the security of U.S. classified information regarding such matters as the means of launching a scientific satellite.
- d. Does not involve actions which imply a requirement for prior consent by any nation over which the satellite might pass in its orbit, and thereby does not jeopardize the concept of "Freedom of Space."

2. NSC Action 1553, *U.S. Policy on Control of Armaments*, was considered by the NSC on 10 May 1956, and approved by President Eisenhower on 16 May 1956. Its annex called for strict ground and aerial (overhead) inspection to verify treaties for the reduction or limitation of arms and fissionable materials:

1. The United States should propose that subsequent to December 31 1957—or as soon as possible thereafter and within one month after the establishment of a satisfactorily functioning inspection system to verify the commitment is accomplished—all future production of fissionable materials:

- a. Shall be subject to effective international inspection; and
- b. Shall be used or stockpiled exclusively for non-weapons purposes under international supervision.

The inspection system, including appropriate ground, aerial, and scientific components, should be promptly and reciprocally installed and its effective operation in states having significant military potential should be demonstrated to the satisfaction of the United States (and other key states), prior to the taking effect of commitment. The continuing effectiveness of the inspection system and the continuing adherence of essential states having a significant military potential, shall be a condition for the continuation of the commitment.

\* \* \* \* \*

3. The United States to propose that upon implementation of 1 above, agreed, equitable, proportionate transfers of fissionable materials shall be commenced by states possessing nuclear weapons, in successive increments from previous production over to internationally inspected and supervised non-weapons purposes, including stockpiling, either national or international. The agreed transfer rate should provide the retention in the early phases of such a program of a very substantial nuclear weapons capability on the part of the United States.

4. The United States to express willingness, contingent upon the agreement and implementation of 1 and 3 above, to agree with other nations to limit or to eliminate nuclear and thermonuclear test explosions thereafter, provided an effective inspection system to verify the ful-

fillment of the commitment has been installed. Pending such agreement the United States should propose that the nuclear powers provide advance notice and permit limited international observation of tests.

5. It is the purpose of the United States, as part of an armaments control system, to seek to assure that the sending of objects into outer space shall be exclusively for peaceful and scientific purposes and that under effective control the production of objects designed for travel in or projected through outer space for [offensive] military purposes shall be prohibited.

Therefore, the United States to propose that, contingent upon the establishment of effective inspection to verify the fulfillment of the commitment, all states agree to provide for international inspection of and participation in tests of outer space objects.

\* \* \* \* \*

8. The United States should propose the progressive development and installation of an inspection and control system which would contribute reciprocally during the stages of its installation to increased safeguards against great surprise attack, and the United States should be willing to begin minor mutual reductions of armament and armed forces during the progressive installation of such an inspection system as a means of beginning such an opening up of the Soviet Union. Such minor reductions shall not in any event be greater than to reach the 2,500,000 force level approved for a first stage in NSC Action No. 1513. Partial aerial surveillance coupled with ground posts and radar installations, under some circumstances, could fill such a description of a progressive development of an inspection system, but ground posts and radar installations without an aerial component would not be adequate. It is vitally important that there must be effective inspection for every portion of every

agreement affecting armaments signed by the United States.

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3. NSC Action 1846, 22 January 1958, *Priorities for Ballistic Missiles and Satellite Programs*. This action identified priorities for missiles and space systems. With the U-2 successfully operating over the Soviet Union at this time, the reconnaissance satellite effort appeared last in order, after the IGY Vanguard/Jupiter-Explorer programs.

4. NSC 5918, *U.S. Policy on Outer Space* dated 17 December 1959, superseded an earlier version (NSC 5814/1, 18 August 1958, *Preliminary U.S. Policy on Outer Space*). It was prepared under the auspices of the National Aeronautics and Space Council (NASC) assisted by an ad hoc committee representing the Department of State, NASA, AEC, NSF, Special Assistant to the President for Science and Technology, the Bureau of the Budget, the CIA, JCS, and USIA. Adopted as amended at the 431<sup>st</sup> National Security Council meeting on 12 January 1960, President Eisenhower approved the policy for release as a NASC paper on 26 January. In approving this policy statement, renumbered NSC 5918/1, the President also rescinded NSC 5520 issued in 1955. This extensive 1960 directive, issued in the wake of Sputnik and after the creation of NASA and the start of Project Corona (a covert reconnaissance satellite in the Talent-Keyhole access and control system), is largely tutorial. National policy guidance appears only in the last section. It identified approved military support applications at pages 6-7 (reconnaissance, early warning of missile attack, weather observation, communications, mapping and geodesy, inspection and control, and navigation), but acknowledged that future military possibilities might include electronic counter-measures, anti-satellite weapons, and bombardment vehicles.

\* \* \* \* \*

### Psychological Exploitation

36. To minimize the psychological advantages which the USSR has acquired as a result of space accomplish-

ments, select from among those current or projected U.S. space activities of intrinsic military, scientific or technological value, one or more projects which offer promise of obtaining a demonstrably effective advantage over the Soviets and, so far as is consistent with solid achievements in the over-all space program, stress these projects in present and future programming.

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#### Reconnaissance Satellites

39. As soon as reasonably practicable, subject to limitations imposed by the President, use reconnaissance satellites to enhance the U.S. intelligence effort.

40. Consider the extent to which information obtained through the military use of space, as in the case of reconnaissance satellites, can be applied to civil purposes.

\* \* \* \* \*

#### International Principles, Procedures and Arrangements

42. Continue to support the principle that, in so far as peaceful exploration and use of outer space are concerned, outer space is freely available for exploration and use by all, and in this connection: (a) consider as a possible U.S. position the right of transit through outer space of orbital space vehicles or objects not equipped to inflict injury or damage; (b) where the U.S. contemplates military applications of space vehicles and significant adverse international reaction is anticipated, seek to develop measures designed to minimize or counteract such reaction; and (c) consider the usefulness of international arrangements respecting celestial bodies.

43. Taking into account, among other factors, the relationship of outer space capabilities to the present and future security position of the United States:

- a. Study the scope of control and character of safeguards required in an international system designed to assure that outer space be used for peaceful purposes only; include in this study an assessment of the technical feasibility of a positive enforcement system and an examination of the possibility of multilateral or international control of all outer space activities.
- b. Study the relationship between any international arrangement to assure that outer space be used for peaceful purposes only and other aspects of the regulation and reduction of armed forces and armaments.
- c. In connection with the prosecution of studies enumerated in 45(a) and (b), give full consideration to the requirements of U.S. security interests.

44. In the interest of establishing an international basis for orderly accomplishment of space flight operations, explore the desirability of and, where so indicated, seek international agreement on such problems as: (a) some form of identification and registration of space vehicles which is to the net advantage of national security; (b) liability for injury or damage caused by space vehicles; (c) reservation of radio frequencies for space vehicles and the related problem of termination of transmissions; (d) avoidance of interference between space vehicles and aircraft; and (e) the re-entry and landing of space vehicles, through accident or design, on the territory of other nations.

\* \* \* \* \*

5. The National Security Council issued NSC 6108, *Certain Aspects of Missile and Space Programs*, on 18 January 1961, just hours before President Eisenhower left office. This directive conferred on the nation's Intercontinental Ballistic Missile (ICBM) programs, the Fleet Ballistic Missile (Polaris) submarine program and the reconnaissance satellite programs "the highest priority above all others for research and development and for achieving operational capability . . ." It author-

ized the production and fielding of a specific number of Polaris submarines and ICBM squadrons and concluded with instructions that circumscribed U.S. efforts directed toward satellite destruction: “Any test which involves destroying a satellite or space vehicle shall not proceed without specific Presidential approval.”

### KENNEDY DIRECTIVES

6. President John F. Kennedy, whose abbreviated presidency began in 1961, initiated a number of space policy actions, including committing the nation to landing a man on the Moon and returning him to earth before the end of the decade. But one of them, a primary NSC directive, influenced directly military space activities for the next twenty years. It focused exclusively on securing international acceptance of overhead reconnaissance conducted from outer space. American signals intelligence and film recovery reconnaissance satellites, which had begun operating in 1960, were judged national assets vital to defense preparedness. In National Security Action Memorandum No. 156, of 26 May 1962, the president requested an assessment of the political and informational aspects of satellite reconnaissance policy. The group formed to conduct this assessment, which became known as the “156 Committee,” issued its *Report on Political and Informational Aspects of Satellite Reconnaissance Policy* on 29 June.<sup>10</sup> The report’s policy recommendations were adopted as National Security Council Action (NSCA) 2454, *Space Policy and Intelligence Requirements*, at the 502<sup>nd</sup> NSC meeting on 10 July 1962. This Kennedy directive set a goal and defined the tactics for creating a favorable international political and legal climate for space reconnaissance by demonstrating to other world leaders in words and actions that this activity fell within the rubric “peaceful uses” of outer space. Expanding on Eisenhower’s dictum contained in NSC 6108, it

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<sup>10</sup> The 156 Committee continued to function until at least 1973. The original 156 members in 1962 consisted of Paul Nitze, Department of Defense, Herbert Scoville, Jr., CIA, Adrian Fisher, Arms Control and Disarmament Agency, Joseph Charyk, NRO, Robert Seamans, Jr., NASA, and U. Alexis Johnson, Department of State, Chair.

instructed government officials to avoid drawing public attention to anti-satellite space weapon systems, and declared that any future development of these weapons should require White House approval, "with [a] full account given to the adverse effects for our reconnaissance satellite program" (paragraph 12).<sup>11</sup>

#### Recommended Policy

1. The United States should maintain the legal position that the principles of international law and the UN Charter apply to activities in outer space and, specifically, that outer space is free, as are the high seas.

2. The U.S. should therefore continue to avoid any position implying that reconnaissance activities in outer space are not legitimate. Similarly, we should avoid any position declaring or implying that such activities are not "peaceful uses."

\* \* \* \* \*

4. Further studies should be made on an urgent basis to determine whether there are releasable data, such as mapping information, or procedures such as occasionally calling TIROS and NIMBUS vehicles "photographic" satellites, which would help create wider public acceptance of space observation and photography.

\* \* \* \* \*

6. It is recognized that the U.S. cannot entirely avoid or disclaim interest in reconnaissance, so that where feasible the U.S. should also seek to gain acceptance of the principle of the legitimacy of space reconnaissance.

7. When confronted by specific Soviet pressure to outlaw reconnaissance activities in space, the U.S. should continue to take a public stand for the legitimacy of the principle of the reconnaissance from outer space, the pre-

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<sup>11</sup> XXV, FOREIGN RELATIONS OF THE UNITED STATES, 1961-1963, 374.

cise form and extent of which would depend upon the circumstances of the confrontation.

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10. The U.S. should not, at this time, publicly disclose the status, extent, effectiveness or operational characteristics of its reconnaissance program.

11. Strict control over public statements and back-grounding concerning reconnaissance satellites should be exercised to ensure consistency with the policy guidelines suggested in these recommendations.

12. No public attention should be directed toward development of anti-satellite capabilities, and any publicized demonstration of developmental work and any actual test of such a capability should require White House approval, with full account given to the adverse effects for our reconnaissance satellite program. We should avoid any indications that physical countermeasures to reconnaissance vehicles would be justified, and as appropriate the U.S. should make a positive effort to propagate the idea that interference with or attacks on any space vehicle of another country in peacetime are inadmissible and illegal.

\* \* \* \* \*

16. The possible roles of space reconnaissance in disarmament inspection arrangements or in creating military stability should be further studied.

17. The U.S. should stand by the disarmament proposal for a provision in Stage One of a Treaty on General and Complete Disarmament banning weapons of mass destruction from being carried in satellites, and providing for advance notification and inspection of all missile and space launchings to ensure that ban. The U.S. should continue to exclude any ban or reconnaissance satellites.

Eleven days before his death in Dallas, on 12 November 1963 President Kennedy issued Confidential National Security Council Action 271 directed to NASA Administrator James Webb, *Cooperation with the USSR on Outer Space Matters*. In it, he asked Webb to initiate "a program of substantive cooperation with the Soviet Union in the field of outer space." The effort was to be coordinated with the Department of State and other agencies, as appropriate. He wished to have the planning proposals combined in an interim report for his review a month later, on 15 December. Kennedy would never see the report, which went to his successor.

#### JOHNSON DIRECTIVES

7. President Lyndon B. Johnson issued three space policy directives through his Special Assistant for National Security Affairs, W. W. Rostow. The first one took up NSC Action 271 issued by his predecessor. This National Security Action Memorandum No. 285, *Cooperation with the USSR on Outer Space Matters*, was directed to the NASA Administrator James Webb on 3 March 1964. In NSAM 285, the President thanked Webb for the report requested by President Kennedy that contained recommendations on space cooperation with the Soviet Union. He endorsed them, requested that Webb and other federal agencies involved "proceed with this program keeping me informed of progress . . . ," and asked that the National Aeronautics and Space Council be briefed. This effort did expand the cooperative exchange of meteorological data and it led, in time, to the Apollo-Soyuz Program.

8. President Johnson issued National Security Action Memorandum 354, *U.S. Cooperation with the European Launcher Development Organization (ELDO)*, on 29 July 1966, directing it to the Secretaries of State and Defense, the NASA Administrator, and the Chairman of the Atomic Energy Commission. NSAM 354 was predicated on a report prepared by the National Aeronautics and Space Council that called for the U.S. to define a policy with respect to the establishment of the Euro-

pean Launcher Development Organization,<sup>12</sup> and the extent to which the United States should cooperate with ELDO’s current and future programs. It made cooperation selective and subject to government-to-government agreement, and restricted the transfer of technology that would advance “nuclear delivery capabilities of . . . member countries” and the passing of technology “to non-ELDO countries without US authorization.”

\* \* \* \* \*

Section B. Areas of US cooperation and assistance

1. General assistance applicable to both short and long range ELDO projects, as follows:
  - a. Training – Participation by ELDO nominees in NASA seminars for technical management training . . . .
  - b. Facilitating export licenses for ELDO requirements . . . .
  - c. Use of NASA test facilities.
  - d. Designation within NASA of a technical office specifically to serve in expediting and assisting . . . ELDO.
2. Short range assistance in the proposed reconfiguration of ELDO-A.

\* \* \* \* \*

3. Long range assistance in the development of follow-up ELDO projects using high-energy cryogenic upper stages (e.g., ELDO-B)

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Section C. Supplementary action. To supplement ELDO-A launch services the US will sell Scout, Thor, and Atlas vehicles and launch services for scientific and applica-

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<sup>12</sup> In 1962, a consortium of seven European states had formed the European Launcher Development Organization (ELDO) and the European Space Research Organization (ESRO), which developed Europe’s satellites. The two organizations merged in 1975 to become the European Space Agency (ESA).

tions satellites to Western European and other countries

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9. On 12 July 1967 President Johnson reissued a 1966 National Security Action Memorandum (NSAM) 338 (Revised), *Policy Concerning U.S. Assistance in the Development of Foreign Communications Satellite Capabilities*. It provided policy guidance for United States government agencies that dealt with requests from "foreign nations or foreign business entities for the transfer of, or other assistance in the field of, space technology applicable to communication satellite systems." It set a precedent on sensitive technology transfer. This directive is not portion-marked, but the following excerpts are unclassified:

\* \* \* \* \*

#### Policy

1. The United States is committed to the encouragement of international cooperation in the exploration and use of outer space. One important use of space is the improvement of communications. In this regard, it is the policy of the United States to support and promote continuing development of a single global commercial communications satellite system. . . .

2. . . . within the limits fixed by national security considerations and other pertinent regulations, the United States may decline to make available space technology to other nations when (a) such technology is critical to the development of a communications satellite capability and (b) when it has been determined that this technology will be used in a manner inconsistent with the concept of and commitments to the continuing development of a single global commercial communications satellite system as embodied in the 1964 Agreement establishing interim arrangements for a global commercial communications satellite system and related Special Agreement (TIAS 5646) or subsequent definitive arrangements or (in the case of military systems) will be used in a manner inconsistent with the concepts of the United States national defense communications satellite system, as discussed in

paragraph 3. The same limitations will apply whenever the United States assists nations to launch communications satellites for either experimental or operational purposes.

3. The United States has established a national defense communications satellite system to accommodate the unique and vital United States National Security requirements that cannot be met by commercial facilities. It is United States policy to encourage selected allied nations to use the United States national defense communications satellite system, rather than to develop independent systems. Costs of such use shall normally be borne by the participating foreign nations. . . .

4. For purposes of this policy statement, the restraints on the transfer of technology and provision of assistance are intended to refer to those of the following which are critical to the development of a communications satellite capability in terms of time, quality, or cost; complete satellites or launch vehicles or components thereof; detailed engineering drawings pertaining to complete satellites or launch vehicles or components thereof; production techniques and equipment, and manufacturing or fabrication processes pertaining to complete satellites or launch vehicles or components thereof; launch services. It is not intended that this policy statement apply to surface terminals and stations or limit dissemination of information concerning systems concepts, description of spacecraft, and normal scientific and technical publications of a professional character. Furthermore, this shall not limit the dissemination of information required to be disclosed by Article 10(f) of the Special Agreement of 1964.

5. Requests for provision of technology or other assistance to a foreign nation will be assessed on a case by case basis in relation to the principles set forth in paragraphs 2 and 4 above. . . .

6. Implementation of restraints provided for in this policy statement shall be through the Munitions Control licensing procedure for items on the United States Munitions List and through the Department of Commerce's export licensing procedure for items not covered by the Munitions List . . . .

7. The foregoing policies shall be kept under review by the Special Assistant to the President for Telecommunications/Director of Telecommunications management and the agencies and departments concerned.

#### NIXON DIRECTIVES

On 4 September 1969, Henry A. Kissinger, Assistant to the President for National Security Affairs, issued National Security Study Memorandum (NSSM) 72 to the Secretary of State, Secretary of Defense, Administrator of NASA, and the Assistant to the President for Science and Technology. NSSM 72 advised recipients that the President had directed formation of an "ad hoc group on International Space Cooperation," and charged it with "preparing a report on possible forms of International Space Cooperation with friendly countries as well as with the Soviet Union." The ad hoc group, to be chaired by a representative of the Secretary of State, was organized at the end of the year and consisted of representatives from State, Defense, NASA, the National Aeronautics and Space Council, and the Assistants to the President for Science and Technology and National Security Affairs, among others. As primary subjects of cooperation, it considered earth resource survey satellites, radio and television broadcasts from space, and joint ventures with the USSR. The NSSM 72 Committee, as it came to be called, not only evaluated cooperating with the Soviet Union and the sharing of products derived from international civil satellite programs, but also the relationship of these programs and their affects on the U.S. National Reconnaissance Program (NRP). For example, the committee devoted considerable attention to the legal and political ramifications of NASA's Earth Resources Satellite (ERS—later called Landsat). It involved the "right to observe" the earth from space, and, in the absence of explicit

international legal principles, “whether it is permissible for any State to acquire, without consent, information relating to the natural resources of other States.”

10. President Richard M. Nixon issued three space policy directives through Henry Kissinger that derived from the work of the NSSM 72 Committee. The first, National Security Decision Memorandum (NSDM) 70, *International Space Cooperation: US-USSR Activities*, appeared on 10 July 1970. The competitive aspect of the lunar space program had ended the year before with a successful United States manned landing on the moon, and the President now approved a cooperative bilateral space program that the 72 Committee forwarded to him. On the President’s approval, the 72 Committee report, *Cooperation Between the US and USSR in Space Activities, Prospects and Opportunities*, became NSDM 70. It concluded:

1. Cooperation with the Soviet Union in space matters is desirable. Such cooperation, if it involves substantive scientific and technical content, could be useful intrinsically as well as from the viewpoint of raising the level of political confidence between ourselves and the Soviets and of easing international tensions. It could yield greater economic and social benefits from applications of space technology on a worldwide basis. It could possibly lead to some cost sharing and to budgetary savings through the synergistic effect of applying both programs to common tasks. Many of these benefits could be realized without impinging on U.S. national security requirements or export control policies.
2. There are a number of areas of space cooperation which could be mutually advantageous—in space research, in practical applications of space technology, in manned flight including space rescue and safety, in tracking, and in planetary exploration. . . .
3. The U.S. has consistently taken the initiative toward cooperation, but our efforts thus far have not been very successful. If the intrinsic and political benefits of cooperation between the Soviets and ourselves in this field

are to be realized, it will be necessary to achieve more meaningful cooperation. However, there is no convincing evidence that further efforts to achieve cooperation would yield early, if any, success in a significant or substantive sense. . . .

4. If future proposals for cooperation are to have a chance of success, they should meet the following criteria:

- a. They should not impinge on Soviet or U.S. military security
- b. They should not affect the Soviet competitive position adversely or excite Soviet suspicions of our objectives
- c. They should not make one party dependent upon the other in space activities of particular importance to national objectives
- d. They should emphasize coordination of relatively independent efforts rather than projects requiring a substantial degree of integrated effort
- e. They must lend themselves to useful cooperation at the present low level of confidence between the Soviets and ourselves. If feasible, they should also allow room for expansion, should that become possible.
- f. They should avoid the impression that the super powers are dividing space between them.

[Despite the pessimism expressed in the conclusion, efforts at cooperation in response to NSDM 70 resulted in NASA's Apollo-Soyuz manned laboratory mission that began later in the Nixon Administration.]

11. A week later, on 17 July 1970, President Nixon issued through Kissinger National Security Decision Memorandum (NSDM) 72, *Exchange of Technical Data Between the United States and the International Space Community*. It was sent to the Secretary of State, the Secretary of Defense, the Executive

Secretary of the National Aeronautics and Space Council, and the NASA Administrator.

The President has reiterated his desire that the United States should encourage and provide ample opportunities for international cooperation in space activities such as the post-Apollo program.

In furtherance of this objective, the President has directed the establishment of an ad hoc interagency group to review the policy aspects of, and establish procedures for, a program of technical data exchange between the United States and those foreign governments and agencies desirous of entering into cooperative arrangements with us.

\* \* \* \* \*

An initial report will be submitted for consideration of the President by August 1, 1970.

12. National Security Decision Memorandum (NSDM) 187, *International Space Cooperation – Technology and Launch Assistance*, the third on this subject signed by Henry Kissinger, was issued on 30 August 1972. This directive was sent to the Secretaries of State and Defense, the NASA Administrator, the Secretary of Commerce, and the Director, Office of Telecommunications Policy. It advised recipients that the President had reviewed a third study prepared in response to NSSM 72 and had approved a statement of objectives for international cooperation in space activities, and a directive on technology transfer as it applied to communications satellite technology. The President had also “decided that the U.S. will extend to all friendly countries and international organizations the position on launch assistance adopted [previously] in the case of member countries of the European Space Conference” (later termed the European Space Agency).

## FORD DIRECTIVES

13. On 7 July 1976, President Gerald R. Ford issued National Security Decision Memorandum (NSDM) 333, *Enhanced Survivability of Critical U.S. Military and Intelligence Space Systems*. Signed by Brent Scowcroft, the President's Special Assistant for National Security Affairs, the NSDM was directed to the Secretaries of State and Defense, the Chairman of the Joint Chiefs of Staff, the DCI, and the Director of the Office of Management and Budget. Recognizing the increasing importance to national security of the nation's military and reconnaissance space assets, it provided policy guidance to ensure for their survivability in space, and it instructed the Secretary of Defense and the Director of Central Intelligence to develop jointly an action plan to implement that policy. This directive, like the first Eisenhower directives, instructed recipients to take *specific* actions to implement the policy.

The introductory paragraph expressed the President's concern with an "emerging Soviet anti-satellite capability and the possible threat to critical U.S. space missions this implies. He considers *preserving the right to free use of space to be a matter of high national priority*" (emphasis added).

\* \* \* \* \*

Policy for Survivability of Space Assets

The President has determined that the United States will continue to make use of international treaty obligations and political measures to foster free use of space for U.S. satellite assets both during peacetime and in times of crisis. However, to further reduce potential degradation of critical space capabilities resulting from possible interference with U.S. military and intelligence space assets, the President also considers it necessary to implement improvements to their inherent technical survivability. . . .

The survivability improvements in critical military and intelligence space assets should be predicated on the following U.S. objectives:

- (1) Provide unambiguous, high confidence, timely warning of any attack directed at U.S. satellites;
- (2) Provide positive verification of any actual interference with critical U.S. military and intelligence satellite capabilities;

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The plan should develop a range of implementation schedule/funding profiles for Presidential consideration. An initial version of this plan should be submitted to the President no later than November 30, 1976.

14. A few days before leaving office, on 18 January 1977, President Ford issued National Security Decision Memorandum (NSDM) 345, *U.S. Anti-Satellite Capabilities*. This directive, also signed by Brent Scowcroft, was sent to the Secretaries of State and Defense, the Director of the Arms Control and Disarmament Agency, the Director of Central Intelligence, and the Chairman of the Joint Chiefs of Staff. It recognized the threat posed by new Soviet imaging radar satellites that possessed a near real time capability for directly supporting USSR military forces, and, among other measures, called for development of a low altitude anti-satellite interceptor that could destroy these space assets in time of war.

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#### Policy with Respect to U.S. Anti-Satellite Capability

The President wishes to emphasize that the United States will continue to stress international treaty obligations in space, including free use of outer space and non-interference with national technical means. However, to counter the direct military threat posed by certain Soviet space assets not covered by the terms of current treaty obligations, as well as to protect against higher level conflict situations in which the Soviets might abrogate current agreements, the President has decided that the United States should acquire a non-nuclear anti-satellite

capability which could selectively nullify certain militarily important Soviet space systems, should that become necessary. In order to be able to use such an anti-satellite capability in a reversible, less provocative way at lower crisis thresholds, as well as to accomplish more permanent kill in high level crises and conflicts, means for both electronic nullification and physical destruction should be pursued.

#### U.S. Anti-Satellite Capability

The President directs that the Secretary of Defense take immediate steps toward the acquisition of non-nuclear anti-satellite capability, including means for electronic nullification as well as physical destruction.

An anti-satellite interceptor should be acquired on an expedited basis. It should be capable of destroying low altitude satellites and of nullifying a small number (6-10) of important Soviet military satellites within a period of one week.

A separate capability to electronically nullify critical Soviet military satellites at all altitudes up to synchronous should also be acquired on an urgent basis.

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#### Arms Control Initiatives

The President further directs the Director of the Arms Control and Disarmament Agency to identify and assess arms control initiatives that would complement development of a limited anti-satellite capability in an overall policy toward military space activities by:

1. Restricting development of high altitude anti-satellite interceptor capabilities.
2. Raising the crisis threshold for use of an anti-satellite.

3. Clarifying acts which constitute interference with space systems.

This effort should be coordinated with the Secretary of Defense, the Secretary of State, and the Director of Central Intelligence. It should not delay the acquisition actions called for in this memorandum.

#### CARTER DIRECTIVES

President Jimmy Carter assumed office in January 1977 and took an immediate, active interest in national security space affairs and its associated policy. Two months after arriving in Washington DC, on 28 March 1977, Carter issued Presidential Review Memorandum/NSC-23, *A Coherent U.S. Space Policy*, addressed to the Vice President and the Secretaries of State and Defense. In this directive the President requested that his Policy Review Committee (Space) “thoroughly review existing policy and prior efforts, and formulate a statement of overall national goals in space, the principles which should guide U.S. government and private use of space and related activities, and a clearer definition of the roles and responsibilities of the federal government agencies involved.” Carter expected “The National Space Policy, implementation plan . . . [and] recommendations and requests will be submitted for my review and approval by 1 July 1977.”

15. On 11 May 1978, President Carter issued the results of this work, Presidential Directive PD/NSC-37, *National Space Policy*. This sweeping space policy directive, the first since Eisenhower’s *U.S. Policy on Outer Space* issued in 1960, encompassed all of the space activities in which the United States engaged. For the first time, it identified a separate military space program and its components, and directed that reconnaissance satellites should henceforth provide tactical support for military operational requirements. The two lead objectives of this Carter policy nevertheless remained consistent with those enumerated by all of his predecessors, and together restated the basic premise of American space policy: “(1) to advance the interests of the United States through the exploration and use of space and (2) to cooperate with other nations in maintaining the freedom of

space for all activities which enhance the security and welfare of mankind.” Also for the first time, it identified the Shuttle-based Space Transportation System as the launch vehicle to “service all authorized space users—domestic and foreign, commercial and governmental—and [to] provide launch priority and necessary security to military and intelligence missions while recognizing the essentially open character of the civil space program.” This decision would force a redesign of contemporary military and reconnaissance satellites to ride on board the Space Shuttle and, as a consequence, it also would incur steep cost increases for the military and intelligence space programs.

The first paragraph of PD/NSC-37 contained eleven principles to guide United States space activities. Six of them applied directly to military space operations and the first one clearly defined, also for the first time, “peaceful purposes” in space:

a. Commitment to the principles of the exploration and use of outer space by all nations for peaceful purposes and for the benefit of all mankind. ‘Peaceful purposes’ allow for military and intelligence-related activities in pursuit of national security and other goals.

\* \* \* \* \*

c. Rejection of any claims to sovereignty over outer space or over celestial bodies, or any portion thereof, and rejection of any limitations on the fundamental right to acquire data from space.

d. The space systems of any nation are national property and have the right of passage through and operations in space without interference. Purposeful interference with operational space systems shall be viewed as an infringement upon sovereign rights.

e. The United States will pursue activities in space in support of its right of self-defense.

f. The United States will maintain a national intelligence space program.

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i. The United States will develop and operate on a global basis active and passive remote sensing operations in support of civil, military, and national intelligence objectives. . . .

[The bulk of this Carter directive addressed military space activities; civil space activity appeared last in order.]

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2. The United States will conduct those activities in space which are necessary to national defense. The military space program shall support such functions as command and control, communications, navigation, environmental monitoring, warning, tactical intelligence, targeting, ocean and battlefield surveillance, and space defense. . . . The following policies shall govern the conduct of the military space programs.

a. Security. The military space program, including dissemination of data, shall be conducted in accordance with Executive Orders and applicable directives for protection of national security information, and commensurate with both the missions performed and the security measures necessary to protect related national intelligence space activities.

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c. Survivability. Survivability of space systems, including all system elements, will be pursued commensurate with the planned need in crisis and war, the threat, and the availability of other assets to perform the mission. Identified deficiencies will be eliminated and an aggressive, long-term program will be applied to provide more assured survivability through evolutionary changes to space systems. . . .

d. Anti-Satellite Capability. In accordance with applicable executive directives, the United States shall

seek a verifiable ban on anti-satellite capabilities . . . .  
 . DoD shall vigorously pursue development of an anti-satellite capability, but will not carry to production those elements which are included in any treaty with the Soviets. Beyond that, some R&D should be continued as a hedge against Soviet breakout. The progress of ASAT arms control negotiations will be reviewed annually to determine if negotiations with the Soviet Union continue to be fruitful relative to the threat posed by Soviet actions in space, and consequently to determine if the U.S. ASAT efforts are still adequate. The space defense program shall include an integrated attack warning, notification, verification, and contingency reaction capability which can effectively detect and react to threats to U.S. space systems.

3. The United States foreign intelligence program shall include a space program to acquire information and data required for the formulation and execution of foreign, military, and economic policies; to support the planning for and conduct of military operations; to provide warning; to support crisis management; and to monitor treaties . . . .

a. Protection of Sensitive Information. The nature, the attributable collected information, and the operational details of intelligence space activities will be classified, and as necessary to protect sensitive aspects, will be controlled in special compartmented security channels. . . .

\* \* \* \* \*

b. Support of Military Operational Requirements. Support of military operational requirements is a major space intelligence mission. National space intelligence assets shall provide appropriate support to deployed military operational forces in balance with their primary mission capabilities. . . .

\* \* \* \* \*

4. The United States shall conduct civil space programs to increase the body of scientific knowledge about the earth and the universe; to develop and operate civil applications of space technology; to maintain United States leadership in space science, applications, and technology; and to further United States domestic and foreign policy objectives. The following policies shall govern the conduct of the civil space program.

a. The United States shall encourage domestic commercial exploitation of space capabilities and systems for economic benefit and to promote the technological position of the United States except that all United States earth-oriented remote sensing satellites will require United States Government authorization and supervision or regulation.

b. Federal civil earth imaging from space . . . will be permitted under controls and when such needs are justified and assessed in relation to civil benefits, national security, and foreign policy. Appropriate controls on other forms of remote earth sensing will be established. Expanded civil use of intelligence space data and technology within appropriate security constraints is encouraged.

\* \* \* \* \*

d. United States federal or private space systems identified as critical to the national defense may be equipped at DoD expense for use in national emergencies or to deny their use by an enemy in times of national emergency declared by the President. . . .

\* \* \* \* \*

f. The United States will develop, manage, and operate the Shuttle-based Space Transportation System through NASA in cooperation with the DoD to service all authorized space users—domestic and foreign, commercial and governmental—and will provide

launch priority and necessary security to the military and intelligence mission while recognizing the essentially open character of the civil space program. Mission control is the responsibility of the mission agency.

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16. Carter's PD/NSC-37 space policy directive provoked immediate criticism from officials in the civil space sector. On 10 October 1978, the President issued a second Presidential Directive, PD/NSC-42, *Civil and Further National Space Policy*, signed by his Special Assistant for National Security Affairs, Zbigniew Brzezinski. This directive, however, hardly met the expectations of NASA officials who wanted it to focus on an increased national commitment to a large manned space station, or on the manned Space Transportation System (Space Shuttle).

\* \* \* \* \*

ADMINISTRATIVE CIVIL SPACE POLICY. The United States' over-arching civil space policy will be composed of three basic components.

First: Space activities will be pursued because they can be uniquely or more efficiently accomplished in space. Our space policy will become more evolutionary rather than centering around a single, massive engineering feat. Pluralistic objectives and needs of our society will set the course for future space efforts.

Second: Our space policy will reflect a balanced strategy of applications, science, and technology development containing essential key elements . . . .

\* \* \* \* \*

Third: It is neither feasible nor necessary at this time to commit the U.S. to a high-challenge, highly-visible space engineering initiative comparable to Apollo. As the resources and manpower requirements for Shuttle development phase down, we will have the flexibility to give greater attention to new space applications and explora-

tion, continue programs at present levels, or contract them [make them smaller]. An adequate Federal budget commitment will be made to meet the objectives . . . .

SPACE APPLICATIONS. The President has approved the following:

Government Role in Remote Sensing

1. Land Programs. Experimentation and demonstrations will continue with LANDSAT as a developmental program. Operational uses of data from the experimental system will continue to be made by the public and private users prepared to do so. . . .

\* \* \* \* \*

3. Weather Programs. In the FY 1980 budget review, OMB—in cooperation with Defense, the DCI, NASA, and NOAA—will conduct a cross-cut review of meteorological satellite programs to determine the potential for future budgetary savings and program efficiency. Based on this cross-cut, the Policy Review Committee (Space) will assess the feasibility and policy implications of program consolidation by April 1, 1979.<sup>13</sup>

\* \* \* \* \*

5. Private Sector Involvement. Under the joint chairmanship of Commerce and NASA, along with other appropriate agencies, a plan of action will be prepared by February 1, 1979, on how to encourage private investment and direct participation in the establishment and operations of civil remote sensing systems. NASA and Commerce jointly will be the contacts for the private sector on this matter and will analyze proposals received be-

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<sup>13</sup> Consolidation of the NOAA and military (DMSP) low altitude meteorological satellite programs did not take place until 1994, at which time it was called a “convergence.” See R. Cargill Hall, *A History of the Military Polar Orbiting Meteorological Satellite Program* (Washington, D.C., Office of the Historian, National Reconnaissance Office, September 2001).

fore submitting to the Policy Review Committee (Space) for consideration and action.

\* \* \* \* \*

SPACE SCIENCE AND EXPLORATION GOALS, Priorities at any given time will depend upon the promise of the science, the availability of particular technology, and the budget situation in support of the following presidentially-approved goals:

- We will maintain US leadership in space science and planetary exploration and progress.
- The US will continue a vigorous program of planetary exploration to understand the origin and evolution of the solar system. . . .
- To utilize the space telescope and free-flying satellites to user in a new era of astronomy, as we explore interstellar molecules, quasars, pulsars, and black holes to expand our understanding of the universe and to complete the first all sky survey across the electromagnetic spectrum.
- To develop a better understanding of the sun and its interaction with the terrestrial environment. Space probes will journey towards the sun. Earth orbiting satellites will measure the variation in solar output and determine the resultant response of the earth's atmosphere.
- To use the Space Shuttle and Spacelab, in cooperation with the Western Europeans, to conduct basic research that complements earth-based life science investigations and human physiology research.
- Our policy in international space cooperation should include three primary elements: (1) support the best science available regardless of national origin but expand our international planning and coordinating effort; (2) seek supplemental foreign support

only for selected experiments-spacecraft which have been chosen on the basis of sound scientific criteria; and (3) avoid lowering cooperative activities below the threshold where our science and international cooperative efforts would suffer.

STEPS TO INCREASE BENEFITS FOR RESOURCES EXPENDED. The President has approved the following:

Strategy to Utilize the Shuttle

1. The strategy for providing some backup expendable launch vehicles (ELV's) is prudent. The exact requirements for ELV procurement will be reviewed in the FY 1980 budget review. . . . The key determinant is the readiness of the Shuttle.

2. As we move toward Shuttle, we will review national policy on separate organizational control to determine whether potential cost savings are possible. Separate Defense and NASA Shuttle support facilities are being prepared to respond to different requirements for orbits, security, and operations. OMB will undertake a budget cross-cut—taking into account all critical factors—on Shuttle operational management responsibility . . . on this issue during the FY 1980 budget review. . . .

\* \* \* \* \*

17. On 10 March 1978, President Jimmy Carter signed Presidential Directive/NSC-33 (PD/NSC-33), *Arms Control for Anti-Satellite (ASAT) Systems*. This brief space policy directive lifted the restriction that he had previously imposed on operational or space based testing of the Ford-approved ASATs, and it authorized the Secretary of Defense “to pursue, for planning purposes, a U.S. ASAT development program encompassing testing in space or against U.S. objects in space deemed essen-

tial to achieve an ASAT capability.”<sup>14</sup> It further directed that “our future dialogue with the Soviets on Space Arms Control should indicate that we intend to seek an ASAT capability as soon as possible unless they are willing to take verified, positive actions to preclude such a move on our part.” (In the event, the U.S. Air Force-developed satellite interceptor would be earth-based, like its predecessors, not a space-based weapon. After a successful test of the F-15 air-launched satellite interceptor in the 1980s, Congress cancelled funding for it and the system never was deployed.)

18. President Carter issued PD/NSC-54 on 16 November 1979. This directive, signed by Brzezinski, established policy for *Civil Operational Remote Sensing* and amplified PD/NSC-42.

\* \* \* \* \*

1. OVERALL DIRECTION. The United States’ interests in remote sensing from space will be served by a three-part structure: (1) Separate classified activities that have no civil counter-parts. (2) Joint or coordinated civil/military activities where both objectives can be satisfied without compromising national policy. (3) Integration of civil operational activities under single civil agency management with coordination and regulation by an interagency board. Joint management and overall system convergence will not be pursued between classified space activities necessary for intelligence and unclassified civil space remote sensing.

2. LAND PROGRAMS. The National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce is assigned the management responsibility for civil operational land remote sensing activities in addition to its ongoing atmospheric and oceanic responsibilities. Initially, the operational land remote sensing sys-

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<sup>14</sup> The United States General Accounting Office subsequently issued an interim report on this ASAT effort, *The U.S. Anti-satellite Capability: Its Progress and Future*, PSAD-79-12, on 7 February 1979, which described the USAF “Advanced Space Defense Program” and treated performance issues related to its development and schedule.

tem from space will be based on LANDSAT technology . .

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3. WEATHER PROGRAMS. Defense and Commerce will maintain and coordinate dual polar orbiting meteorological programs. We will continue procurement of current satellite systems with Defense and Commerce each operating separate satellites to meet the differing needs of the military and civil sectors. When any new polar orbiting satellites are justified they will be jointly developed and procured by Defense, Commerce and NASA to maximize technology-sharing and to minimize cost. An appropriate coordination mechanism will be established to assure effective cooperation and to prevent duplication.

4. OCEAN PROGRAMS. If a decision is made to develop oceanographic satellites, joint Defense/Commerce/NASA, development, acquisition and management will be pursued. A Committee will be established, with the above representation expanded to include State, CIA, and NSF. The Committee will forward recommendations on policy issues to the Policy review Committee (Space) for consideration and action.

#### REAGAN DIRECTIVES

19. President Ronald Reagan, like President Carter, took a strong interest in space affairs, and during his two terms he introduced to national space policy more changes than any single President since Dwight Eisenhower. Shortly after assuming office, on 18 November 1981, he signed National Security Decision Directive Number 8, *Space Transportation System*. NSDD-8 dealt with the use and assignment of the manned Space Shuttle, which had just entered service a few months earlier, and began the space policy changes that would continue throughout his presidency. It confirmed the Space Shuttle as *the primary* U.S. space launch system for all U.S. military and civil space

launches. It also assigned priority in shuttle launches to the National Reconnaissance Program. Moreover, NSDD-8 reversed President Carter's policy decision that called for the United States to continue to procure Expendable Launch Vehicles (ELVs) for military and reconnaissance space missions. (Because only *four* Space Shuttles were authorized and built, however, the air force and NRO requested, and Congress eventually did approve the purchase ten backup ELVs in 1985, over NASA's objections.)<sup>15</sup>

### SPACE TRANSPORTATION SYSTEM

Recognizing the importance of space programs in the broad commercial, civil, and national security needs, the United States is committed to a vigorous effort that will ensure leadership in these areas. The Space Transportation System (STS) is a vital element in fulfilling these needs.

This decision establishes national policy that shall guide the activities related to the STS. The United States will continue to develop the STS through the National Aeronautics and Space Administration in cooperation with the Department of Defense to service all authorized space users. The STS will be the primary space launch system for both United States military and civil government missions. The transition to the Shuttle should occur as expeditiously as practical.

The STS is a national program requiring sustained commitments by all departments and agencies. NASA will assure the Shuttle's utility to the civil government

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<sup>15</sup> Memorandum from E. C. Aldridge, Jr., Acting Secretary of the Air Force, to Casper Weinberger, Secretary of Defense, *Subject: "DOD Space Launch Vehicles - Decision Memorandum"* (May 1984), in DAVID N. SPIRES, II *ORBITAL FUTURES: SELECTED DOCUMENTS IN AIR FORCE SPACE HISTORY 897* (Washington DC: U.S. Government Printing Office, 2004). See also NSDD 164, "National Security Launch Strategy," in this collection. The best description of the NASA-DOD contention over backup ELVs is contained in an unpublished memoir written by former Director of the National Reconnaissance Office Aldridge, "Assured Access: The Bureaucratic Space War," ca. 1989, which is on file in the NRO Archive and Records Center.

and non-government users. In coordination with NASA, the Department of Defense will assure the Shuttle's utility to defense and integrate national security missions into the Shuttle system. . . . Major changes to STS program capabilities will require my approval.

20. On 4 July 1982, President Reagan issued National Security Decision Directive 42 (NSDD-42), *National Space Policy*. This omnibus directive superseded Carter PDs 37, 42, and 54, and NSDD-8. (At the end of each administration, the NSC retires these directives to the Presidential Libraries and normally does not retain copies. Absent a rigorous search, it is possible that only the most recent space directives produced in the 1970s were known to members of Reagan's White House and NSC staff.) This particular directive introduced a number of significant changes in policy; most notably, it authorized deployment of offensive space weapons (see part IV.B. below). Five objectives, or goals, were to guide U.S. space policy in the 1980s, with "freedom of space" appearing at the end of the list.

#### I. INTRODUCTION AND PRINCIPLES (U)

\* \* \* \* \*

The Space Shuttle is to be a major factor in the future evolution of United States space programs. It will continue to foster cooperation between the national security and civil efforts to ensure efficient and effective use of national resources. . . .

The basic goals of United States space policy are to: (a) strengthen the security of the United States; (b) maintain United States space leadership; (c) obtain economic and scientific benefits through the exploitation of space; (d) expand United States private-sector investment and involvement in civil space and space-related activities; (e) promote international cooperative activities that are in the national interest; and (f) cooperate with other nations in maintaining the freedom of space for all activities that enhance the security and welfare of mankind.

The United States space program shall be conducted in accordance with the following basic principles: [Of the nine basic principles listed to guide U.S. space activity, all but one applied directly to military space missions. Here, another Eisenhower dictum still appeared first in order:]

A. The United States is committed to the exploration and use of outer space by all nations for peaceful purposes and for the benefit of all mankind. "Peaceful purposes" allow for military and intelligence-related activities in pursuit of national security and other goals.

B. The United States rejects any claims to sovereignty by any nation over outer space of celestial bodies, or any portion thereof, and rejects any limitations on the fundamental right to acquire data from space.

C. The United States considers the space systems of any nation to be national property with the right of passage through and operations in space without interference. Purposeful interference with space systems shall be viewed as an infringement upon sovereign rights.

\* \* \* \* \*

E. The United States will conduct international cooperative space-related activities that achieve sufficient scientific, political, economic, or national security benefits for the nation.

F. The United States space program will comprise three separate, distinct, and strongly interacting sectors—Military, National Foreign Intelligence, and Civil. Close coordination, cooperation and information exchange will be maintained among these sectors to avoid unnecessary duplication. All programs in these sectors will operate under conditions that protect sensitive technology and data and that promote

acceptance and legitimacy of United States space activities.

G. The United States Space Transportation System (STS) is the primary space launch system for both national security and civil government missions. STS capabilities and capacities shall be developed to meet appropriate national needs and shall be available to authorized users—domestic and foreign, commercial, and governmental.

H. The United States will pursue activities in space in support of its right of self-defense.

I. The United States will continue to study space arms control options. The United States will consider verifiable and equitable arms control measures that would ban or otherwise limit testing and deployment of specific weapons systems should those measures be compatible with United States national security. The United States will oppose arms control concepts or legal regimes that seek general prohibitions on the military or intelligence use of space.

## II. SPACE TRANSPORTATION SYSTEM

The Space Transportation System (STS) is composed of the Space Shuttle, associated upper stages, and related facilities. The following policies shall govern the development and operation of the STS:

A. The STS is a vital element of the United States space program and is the primary space launch system for both United States national security and civil government missions. The STS will be afforded the degree of survivability and security protection required for a critical national space resource.

B. The first priority of the STS program is to make the system fully operational and cost-effective in providing routine access to space.

\* \* \* \* \*

D. United States Government spacecraft should be designed to take advantage of the unique capabilities of the STS. The completion of transition to the Shuttle should occur as expeditiously as practical.

E. NASA will assure the Shuttle's utility to the civil users. In coordination with NASA, the DoD will assure the Shuttle's utility to national defense and will integrate national security missions into the Shuttle System. . . .

F. Expendable launch vehicle operations shall be continued by the United States Government until the capabilities of the STS are sufficient to meet its needs and obligations. Unique national security considerations may dictate developing special-purpose launch capabilities.

\* \* \* \* \*

#### IV. MILITARY SPACE PROGRAM

The United States will conduct those activities in space that are necessary to national defense. The military space program shall support such functions as command and control, communications, navigation, environmental monitoring, warning, tactical intelligence, targeting, ocean and battlefield surveillance, and force application (including an aggressive research and development program which supports these functions). In addition, military space programs shall contribute to the satisfaction of national intelligence requirements. The following policies shall govern the conduct of the military space program:

\* \* \* \* \*

B. Anti-satellite (ASAT) Capability. The United States will develop and deploy an ASAT capability to achieve an operational system at the earliest practical date. The primary military purposes of a United States ASAT capability are to (a) deter threats to space systems of the

United States and its Allies and, within such limits imposed by international law, to deny any adversary the use of space-based systems that provide support to hostile military forces.

C. Force Application. The United States will, consistent with treaty obligations: (a) develop and maintain an integrated attack warning, notification, verification, and contingency reaction capability which can effectively detect and react to threats to United States space systems; (b) conduct research and planning to be prepared to develop, acquire, and deploy space weapon systems and to counter adversary space activities, should national security conditions dictate. These efforts must ensure a reasonable hedge against breakout in space and space-related weapons by any adversary and should support technology advances that will place the United States in a favorable strategic posture.

D. Interaction with the National Foreign Intelligence Space Program. The Secretary of Defense, in concert with the Director of Central Intelligence, and for the purpose of supporting operational military forces, may propose modifications or augmentations to national foreign intelligence space systems as necessary. The DoD may develop and operate space systems to support tactical military operations in the event national foreign intelligence systems cannot provide the necessary intelligence support to the DoD.

\* \* \* \* \*

## V. NATIONAL FOREIGN INTELLIGENCE SPACE PROGRAM

The United States foreign intelligence program shall include a space program to acquire information and data required for the formulation and execution of foreign, military, and economic policies; to support the planning for and conduct of military operations; to provide warning; to support crisis management; to monitor treaties; and to perform research and devel-

opment related to these functions. The following policies shall govern the conduct of this program:

\* \* \* \* \*

B. Support of Military Operational Requirements.

Support of military operational requirements is a major space intelligence mission. National space intelligence assets shall provide appropriate support to deployed military operational forces in balance with their primary mission capabilities. In order to ensure a proper balance between the national and tactical missions of these assets, there will be military involvement in the requirements, taskings, exploitation, and dissemination functions and in the development program. The Director of Central Intelligence will, together with the Secretary of Defense, ensure that there is no unnecessary overlap between national foreign intelligence programs and DoD intelligence programs.

C. Interaction with the Military Space Program.

The Director of Central Intelligence, in concert with the Secretary of Defense, may propose modifications or augmentations to military space systems necessary to support national foreign intelligence needs.

\* \* \* \* \*

VI. INTER-SECTOR RESPONSIBILITIES

This section contains guidance applicable to and binding upon the military, national foreign intelligence and civil space programs.

\* \* \* \* \*

B. Civil earth-imaging from space, at resolutions at or better than ten meters, will be permitted under controls and when such needs are justified and assessed in relation to civil benefits, national security and foreign policy.

C. Civil remote sensing system constraints on spatial resolution, timeliness, spectral resolution, substantive content, or other appropriate parameters will be periodically reviewed to determine when policy constraints should be revised or imposed.

D. United States intelligence, military, and civil Federal agencies should foster maximum use of satellite imagery products, consistent with essential security requirements and used needs. The Director of Central Intelligence will continue efforts to facilitate the availability of imagery products outside of special control channels.

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21. President Reagan signed NSDD-50, *Space Assistance and Cooperation Policy*, on 6 August 1982. This directive replaced NSDM-187 of 30 August 1972, and provided general guidance for U.S. assistance with launch vehicles, space hardware, software, and related technologies, and international space cooperation. It charged the Assistant to the President for National Security Affairs with issuing "implementing guidelines."

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## II. Policy Governing Space Launch Assistance

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U.S. launch assistance will be available to interested countries, international organizations or foreign business entities for those spacecraft projects which are for peaceful purposes and are consistent with U.S. laws and obligations under relevant international agreements and arrangements (such as Intelsat) as determined by the U.S. Government.

## III. Policy Governing Space Hardware, and Related Technologies Assistance

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Sales of unclassified U.S. space hardware, software, and related technologies for use in foreign space projects will be for peaceful purposes; will be consistent with relevant international agreements and arrangements and relevant bilateral agreements and arrangements; will serve our objectives for international cooperation in space activities (see Section IV); will contain restrictions on third country transfers; will favor transfers of hardware over transfers of technology; will not adversely affect U.S. national security, foreign policy, or trade interests through diffusion of technology in which the U.S. has international leadership; and will continue to be subject to the export control process. . . .

#### IV. Objectives of International Cooperation in Space Activities

The broad objectives of the United States in international cooperation in space activities are to protect national security; promote foreign policy considerations; advance national science and technology; and maximize national economic benefits, including domestic considerations. The suitability of each cooperative space activity must be judged within the framework of all of these objectives.

22. On 16 May 1983, President Reagan signed National Security Decision Directive Number 94 (NSDD-94), *Commercialization of Expendable Launch Vehicles*. This directive encouraged the use of existing American expendable launch vehicles (ELVs) for commercial satellite applications. The policy intended to support the continued manufacture of American ELVs at least for commercial purposes. But, seeming to contradict this encouragement, Paragraph III, which expanded on NSDD-8, now made plain that NASA's Space Transportation System (STS) would also launch commercial satellites as its manifest permitted, in competition with ELVs.

## I. INTRODUCTION

The United States Government encourages domestic commercial exploitation of space capabilities, technology, and services for U.S. national benefit. The basic goals of U.S. space launch policy are to (a) ensure a flexible and robust U.S. launch posture to maintain space transportation leadership; (b) optimize the management and operation of the STS program to achieve routine, cost-effective access to space; (c) exploit the unique attributes of the STS to enhance the capabilities of the U.S. space program; and (d) encourage the U.S. private sector development of commercial launch operations.

## II. POLICY FOR COMMERCIALIZATION OF EXPENDABLE LAUNCH VEHICLES

The U.S. Government fully endorses and will facilitate the commercialization of U.S. Expendable Launch Vehicles (ELVs).

The U.S. Government will license, supervise, and/or regulate U.S. commercial ELV operations only to the extent required to meet its national and international obligations and to ensure public safety. . . .

The U.S. Government encourages the use of its national ranges for U.S. commercial ELV operations. . . .

The U.S. Government will have priority use of U.S. Government facilities and support services to meet national security and critical mission requirements. The U.S. Government will make all reasonable efforts to minimize impacts on commercial operations.

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The U.S. Government will review and approve any proposed commercial launch facility and range as well as subsequent operations conducted therefrom. Near-term demonstration or test flights of commercial launch vehicles conducted from other than a U.S. Government na-

tional range will be reviewed and approved on a case-by-case basis using existing licensing authority and procedures.

### III. RELATIONSHIP OF STS AND COMMERCIAL ELVs

Notwithstanding the U.S. Government policy to encourage and facilitate private sector ELV entry into the space launch market, the U.S. Government will continue to make the Space Shuttle available for all authorized users—domestic and foreign, commercial and governmental—subject to U.S. Government needs and priorities. Through FY 1988, the price for STS flights will be maintained in accordance with the currently established NASA pricing policies in order to provide market stability and assure fair competition. Beyond this period, it is the U.S. Government's intent to establish a full cost recovery policy for commercial and foreign STS flight operations.

\* \* \* \* \*

23. President Reagan signed NSDD-119, *Strategic Defense Initiative*, on 6 January 1984. This directive referred to renewed Soviet efforts to develop a ballistic missile defense capability, the possibility that the USSR might "break out" of the Treaty on the Limitation of Anti-Ballistic Missile Systems (ABM Treaty),<sup>16</sup> and the destabilizing effect that this would have on the current strategy of nuclear deterrence based on the threat of retaliation, known as Mutually Assured Vulnerability. Accordingly, the directive authorized exploring technology that could be applied to defend against ballistic missile attack, without specifying whether that technology should be confined to space- or earth-based systems. Both approaches thus were left open to study.

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<sup>16</sup> The ABM Treaty, adopted in 1972 as part of the first round of Strategic Arms Limitation Talks (SALT I), placed limits on *space weapons* for missile defense. It prohibited signatories from beginning efforts "to develop, test, or deploy new ABM systems or components which are sea-based, air-based, space-based, or mobile land-based." See Treaty on the Limitation of Anti-Ballistic Missile Systems, May 26, 1972, 23 U.S.T. 3435.

\*\*\*\*\*

A committed technology development and demonstration effort must be undertaken before any decision to proceed to engineering design of a strategic defense system can be contemplated. I have decided to initiate a focused program to demonstrate the technical feasibility of enhancing deterrence and thereby reducing the risk of nuclear war through a greater reliance on defensive strategic capabilities. The following actions will be implemented immediately:

1. The U.S. will undertake a comprehensive program to develop and demonstrate key technologies associated with concepts for defense against ballistic missiles. . . .
2. The ballistic missile defense program must be carefully coordinated with other strategic defense programs. The implications of a combination of active and passive defense concepts must also be considered.
3. The Department of Defense shall manage the strategic defense program. . . .
4. The strategic defense initiative will place principal emphasis on technologies involving non-nuclear kill concepts. Research on new strategic defense concepts utilizing nuclear devices should continue as a hedge against a Soviet ABM breakout.
5. The strategic defense program shall protect the option of near-term deployment of a limited BMD capability (non-nuclear if possible) as one possible interim response to Soviet BMD breakout.

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7. The Director of Central Intelligence shall increase the emphasis on our efforts to assess developments in Soviet ballistic missile defense on an annual basis. . . .

\* \* \* \* \*

24. On 15 August 1984, President Reagan signed NSDD-144, *National Space Strategy*, which described a strategy to achieve national policy objectives contained in NSDD-42. Echoing President Kennedy's Apollo challenge, this NSDD added the objective of developing a permanently manned space station in earth orbit within ten years, while it addressed other key NSDD-42 objectives in turn. But, in a significant departure from NSDD-42, NSDD-144 identified "the need for [a] launch system complementary to the STS to hedge against unforeseen technical and operational problems . . ." Accordingly, the national security space sector would "pursue the use of a limited number of ELVs to complement the STS." The National Reconnaissance Office, which had pressed for the purchase of additional ELVs, had broken the STS hammerlock on all U.S. launch operations.

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#### THE SPACE TRANSPORTATION SYSTEM (STS)

Insure routine, cost-effective access to space with the STS. The STS is a critical factor in maintaining U.S. space leadership, in accomplishing the basic goals of the National Space Policy, and in achieving a permanent manned presence in space. . . . As such, NASA's first priority is to make the STS fully operational and cost-effective in providing routine access to space.

Implementation: The STS program will receive sustained commitments by all affected departments and agencies. Enhancements of STS operational capability, upper stages, and efficient methods of deploying and retrieving payloads will be pursued as national requirements are defined.

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The STS will be fully operational by 1988. On October 1, 1988, prices for STS services and capabilities provided to commercial and foreign users will reflect the full cost of

such services and capabilities. NASA will develop a time-phased plan for implementing full cost recovery for commercial and foreign STS flight operations. . . .

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#### THE CIVIL SPACE PROGRAM

Establish a permanently manned presence in space. NASA will develop a permanently manned Space Station within a decade. The development of a civil Space Station will further the goals of space leadership and the peaceful exploration and use of space for the benefit of all mankind. The Space Station will enhance the development of the commercial potential of space. It will facilitate scientific research in space. It will also, in the longer term, serve as a basis for future major civil and commercial activities to explore and exploit space.

Implementation: As a civil program, the Space Station will be funded and executed by NASA beginning in FY 1985 with the goal of the establishment of a permanently manned presence in space within a decade.

Foster increased international cooperation in civil space activities. The U.S. will seek mutually beneficial international participation in its civil and commercial space and space-related programs. As a centerpiece of this priority, the U.S. will seek agreements with friends and allies to participate in the development and utilization of the Space Station.

Implementation: NASA and the Department of State will make every effort to obtain maximum mutually beneficial foreign participation in the Space Station program, consistent with the Presidential commitment for international participation and NSDD-50. . . .

Identify major long-range national goals for the civil space program. Major long-range goals for the civil space program are essential to meeting the national commit-

ment to maintain United States leadership in space and to exploit space for economic and scientific benefit.

Implementation: In accordance with the FY 1985 NASA Authorization Act, the President will appoint a National Commission on Space to formulate an agenda for the United States space program. The commission shall identify goals, opportunities, and policy options for United States civilian space activity for the next twenty years. . . .

\* \* \* \* \*

#### NATIONAL SECURITY SPACE PROGRAMS

Maintain assured access to space for national security payloads. The national security sector must pursue an improved assured launch capability under peace, crisis, and conflict conditions. This capability must satisfy two specific requirements—the need for launch system complementary to the STS to hedge against unforeseen technical and operational problems, and the need for a launch system suited for operations in crisis and conflict situations. Unmanned, expendable launch vehicles could satisfy operational needs for a launch system which complements the STS and extends our ability to conduct launch operations further into the spectrum of conflict.

Implementation: . . . the national security sector will pursue the use of a limited number of ELVs to complement the STS. Selected national security payloads will be identified for dedicated launch on ELVs, but will [also] remain compatible with the STS.

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Continue to study space arms control options. The United States will continue to study space arms control options in accordance with the guidance in NSDD-42.

\* \* \* \* \*

Continue to integrate the use of appropriate space systems with operational forces. The integration of the use of appropriate space systems with operational forces for use during peace, crisis, and all levels of conflict is a fundamental element of defense strategy. Space systems make extensive contributions to our security, and dependence on them continues to increase. . . .

Implementation: DOD space activities will be structured to provide effective support to operational forces in peace, crisis, and war. . . .

\* \* \* \* \*

Insure that DOD space and space-related programs will support the Strategic Defense Initiative. In light of the uncertain long-term stability of offensive deterrence, an effort will be made to identify defensive means of deterring nuclear war. The U.S. has been investigating the feasibility of eventually shifting toward reliance upon a defensive concept. A program has been initiated to demonstrate the technical feasibility of enhancing deterrence through greater reliance on defensive strategic capabilities. . . . The Department of Defense will posture its space activities so as to preserve options to support the demonstration of capabilities as they are defined and become available . . . .

\* \* \* \* \*

Complete the approved modernization for the national foreign intelligence space program. Over the next decade continuation of the modernization program . . . will result in significant improvements in the posture of the national foreign intelligence space program and supporting processing, exploitation, and analysis capabilities, thereby significantly enhancing support for: the formulation and execution of foreign, defense, and economic policies; the planning for and conduct of military operations; the provision of indications and warning of impending hostilities; crisis management; and the monitoring of

current and future arms control agreements, treaties, and commitments.

\* \* \* \* \*

25. President Ronald Reagan signed National Security Decision Memorandum 164 (NSDD-164), *National Security Launch Strategy*, on 25 February 1985. This directive, issued eleven months *before* the loss of Space Shuttle *Challenger*, provided the strategy to implement the provisions for future U.S. launch operations contained in NSDD-144: that the Space Transportation System (STS) would serve as the primary space launch system for both national security and civil government missions, but that the defense department would pursue an improved assured launch capability with Expendable Launch Vehicles to complement the STS. Each one of the four Space Shuttles was recommitted to eight flights per year at a minimum.

The National Aeronautics and Space Administration (NASA) and the Department of Defense (DoD) will work together to insure that the STS is fully operational and cost-effective at a flight rate sufficient to meet justified needs. (The target rate is 24 flights per year.)

The Air Force will buy ten expendable launch vehicles (ELVs) and will launch them at a rate of approximately two per year during the period 1988-92. . . .

DoD will rely on the STS as its primary launch vehicle and will commit to at least one-third of the STS flight available during the next ten years. NASA and DoD will jointly develop a pricing policy for DoD flights that provides a positive incentive for flying on the Shuttle. . . .

DoD and NASA will jointly study the development of a second-generation space transportation system – making use of manned and unmanned systems to meet the requirements of all users. A full range of options will be studied, including Shuttle-derived technologies and others. . . .

\* \* \* \* \*

26. On 27 December 1986, eleven months after the loss of Space Shuttle *Challenger*, President Reagan issued National Security Decision Directive No. 254 (NSDD-254), *United States Space Launch Strategy*, which superseded NSDD-164. This directive reversed entirely the national commitment to the Space Shuttle as the nation's primary launch vehicle, but it nevertheless authorized procurement of a replacement fourth shuttle to maintain a fleet of four.

#### Introduction

This directive establishes U.S. national policy for restoration of the capability to launch satellites and missions into space to support U.S. national security, civil, and commercial goals using space. It is essential that U.S. space launch operations be reconstituted as efficiently as possible consistent with available funding and safety concerns; and that the reconstituted U.S. space launch assets provide a balanced, robust, flexible space launch capability which can function independently of failures in any single launch vehicle system, allow a return to regularly scheduled launch operations, meet continuing requirements, help make up for lost launch opportunities and reassert global space leadership.

#### National Space Launch Capability

The U.S. national space launch capability will be based on a balanced mix of launchers, consisting of the Space Transportation System (STS) and expendable launch vehicles (ELVs). The elements of this mix will be defined to best support the mission needs of the national security, civil government and commercial sectors of U.S. space activities. Critical mission needs will be supported, whenever necessary, by both the STS and ELVs so as to provide added assurance that payloads can be launched regardless of specific launch availabilities.

a. National Security Space Transportation. The national security space sector will use both the STS and ELVs as determined by specific mission requirements. Selected critical payloads will be designed for dual-compatibility, i.e., capable of being launched by either the STS or the ELVs. Provision will be made for additional ELV launch facilities needed to support the full range of orbits required by the national security missions.

Implementation: The Department of Defense (DoD) will procure additional ELVs to maintain a balanced launch capability and to provide access to space. The DOD will implement procedures to assure payload/launch vehicle compatibility and scheduling, and maintain a launch capability for ELVs at both the East and West Coast launch sites. DOD and NASA will jointly establish a revised price for national security missions that use the STS.

\* \* \* \* \*

27. One year before leaving office, on 5 January 1988, President Reagan signed National Security Decision Directive No. 293 (NSDD-293), *National Space Policy*. It consolidated the policy, guidelines, and implementing instructions contained in most of the related NSDDs issued previously in his administration. The fundamental objective "Freedom of Space," now accepted and codified in international law, appeared as a right to be protected under Part II. And, for the first time, the words "manned spaceflight" began to be replaced with the gender-neutral "human spaceflight"—although this substitution was not consistent, and the word "mankind" in its original generic interpretation also escaped attention and continued to be employed. This sweeping directive embraced policy objectives for all space sectors: civil, military, intelligence, and commercial. It also provided "guidelines" that charged these sectors with the steps necessary to execute that policy.

In another "first," under Military Space Sector Guidelines, this policy directive adopted the nomenclature for military space

activities that the USAF Space Command had devised in the 1980s and pressed on policy-makers: “Space Support” (robust launch systems and launch sites); “Force Enhancement” (contemporary defense support space systems such as navigation, communication, reconnaissance, and early warning); “Space Control” (survivable space systems and anti-satellite weapons to deny space activities to hostile forces); and “Force Application” (conduct research and development for space weapons that could attack targets on earth). Of the four defined activities, however, only the first two existed then, and they remain the only ones that exist at this writing. Nevertheless, a major and I think sensible effort was devoted to making U.S. military and intelligence satellites more “survivable” in space—at least until the Soviet Union collapsed in 1991.

## NATIONAL SPACE POLICY

\* \* \* \* \*

### II. GOALS AND PRINCIPLES

A fundamental objective guiding United States space activities has been, and continues to be, space leadership. Leadership in an increasingly competitive international environment does not require United States preeminence in all areas and disciplines of space enterprise. It does require United States preeminence in the key areas of space activity critical to achieving our national security, scientific, technical, economic, and foreign policy goals.

- a. The overall goals of United States space activities are: (1) to strengthen the security of the United States; (2) to obtain scientific, technological and economic benefits for the general population and improve the quality of life on Earth through space-related activities; (3) to encourage continuing United States private sector investment in space and related activities; (4) to promote international cooperative activities taking into account United States national security, foreign policy, scientific, and economic inter-

ests; (5) to cooperate with other nations in maintaining the freedom of space for all activities that enhance the security and welfare of mankind; and, as a long-range goal, (6) to expand human presence and activity beyond Earth orbit into the solar system.

b. United States space activities shall be conducted in accordance with the following principles:

(1) The United States is committed to the exploration and use of outer space by all nations for peaceful purposes and for the benefit of all mankind. "Peaceful purposes" allow for military and intelligence-related activities in pursuit of national security and other goals.

(2) The United States will pursue military and intelligence-related activities in space in support of its inherent right of self-defense and its defense commitments to its allies.

(3) The United States rejects any claims to sovereignty by any nation over outer space or celestial bodies, or any portion thereof, and rejects any limitations on the fundamental right of sovereign nations to acquire data from space.

(4) The United States considers the space systems of any nation to be national property with the right of passage through and operations in space without interference. Purposeful interference with space systems shall be viewed as an infringement on sovereign rights.

\* \* \* \* \*

## V. MILITARY SPACE POLICY

The United States will conduct those activities in space that are necessary to national defense. Space activities will contribute to national security objectives by 1) deterring, or if necessary, defending against enemy attack; 2)

assuring that forces of hostile nations cannot prevent our own use of space; 3) negating, if necessary, hostile space systems; and 4) enhancing operations of United States and Allied forces. Consistent with treaty obligations, the military space program shall support such functions as command and control, communications, navigation, environmental monitoring, warning, tactical intelligence, targeting, ocean and battlefield surveillance, and force application (including research and development programs which support these functions). In addition, military space programs shall contribute to the satisfaction of national intelligence requirements.

#### VI. NATIONAL FOREIGN INTELLIGENCE SPACE POLICY

The United States foreign intelligence program shall include a space program to acquire information and data required for the formulation and execution of foreign, military, and economic policies; to support the planning for, the conduct of, military operations; to provide warning; to support crisis management; to monitor compliance with treaty obligations; and to perform research and development related to these functions.

\* \* \* \* \*

#### POLICY GUIDELINES AND IMPLEMENTING ACTIONS

The following Policy Guidelines and Implementing Actions provide a framework through which the policies in this directive shall be carried out. Agencies will use these sections as guidance on priorities, including preparation, review, and execution of budgets for space activities, within the overall resource and policy guidance provided by the President. . . .

#### I. CIVIL SPACE SECTOR GUIDELINES

\* \* \* \* \*

d. Permanent Manned Presence. NASA will develop the Space Station to achieve permanently manned operational capability by the mid-1990s. The Space Station will: (1) Contribute to United States preeminence in critical aspects of manned spaceflight; (2) provide support and stability to scientific and technological investigations; (3) provide early benefits, particularly in the materials and life sciences; (4) promote private sector experimentation preparatory to independent commercial activity; (5) allow evolution in keeping with the needs of Station users and the long-term goals of the United States; (5) provide opportunities for commercial sector participation; and (6) contribute to the longer term goal of expanding human presence and activity beyond Earth orbit into the solar system.

e. Manned Spaceflight Preeminence. Approved programs such as efforts to improve the Space Transportation System (STS) and return it to safe flight and to develop, deploy, and use the Space Station, are intended to ensure United States preeminence in critical aspects of manned spaceflight.

\* \* \* \* \*

### III. MILITARY SPACE SECTOR GUIDELINES

#### a. General:

(1) The Department of Defense (DOD) will develop, operate, and maintain an assured mission capability through an appropriate mix of robust satellite control, assured access to space, on-orbit sparing, proliferation, reconstitution or other means.

(2) The military space program, including dissemination of data, shall be conducted to protect critical technologies and mission aspects in accordance with Executive Orders and applicable directives for the protection of national security information and com-

mensurate with both the missions performed and the security measures necessary to protect related space activities.

(3) DOD will ensure that the military space program incorporates the support requirements of the Strategic Defense Initiative.

b. Space Support:

(1) Military and Intelligence space sectors may use both manned and unmanned launch systems as determined by specific mission requirements. DOD, as launch agent for both sectors, will, in coordination with the Director of Central Intelligence (DCI), distribute payloads among launch systems and launch sites to minimize the impact of loss of any single launch system or launch site on mission performance. The DOD will procure unmanned launch vehicles or services and maintain launch capability on both the East and West coasts. DOD will also continue to enhance the robustness of its satellite control capability through an appropriate mix of satellite autonomy and survivable command and control, processing, and data dissemination systems.

(2) DOD will study concepts and technologies which would support future contingency launch capabilities.

c. Force Enhancement:

(1) The DOD, in coordination with the DCI as appropriate, will develop, operate, and maintain space systems and develop plans and architectures to meet the requirements of operational land, sea, and air forces through all levels of conflict commensurate with their intended use.

(2) Interaction with the National Foreign Intelligence Space Sector. DOD will establish the requirements for the collection of intelligence data in support of the

responsibilities of the DOD through all levels of conflict. . . .

d. Space Control:

(1) The DOD will develop, operate, and maintain enduring space systems to ensure its freedom of action in space and, upon appropriate direction, deny such freedom of action to its adversaries. . . .

(2) Anti-satellite (ASAT) Capability. The United States will develop and deploy a comprehensive capability including both kinetic and directed energy weapons. This capability will be structured to deny an adversary the use of space-based systems at all altitudes that provide support to hostile military forces and to deter threats to space systems of the United States and its allies. The DOD will continue to seek to eliminate any congressional limitations on development or testing of such capabilities. . . .

(3) DOD space programs will pursue a survivability enhancement program with long-term planning for future requirements. . . .

\* \* \* \* \*

e. Force Application. The DOD will, consistent with treaty obligations, conduct research, development, and planning to be prepared to acquire, and deploy space weapon systems should national security conditions dictate. These efforts must ensure the capability to respond in a timely and effective manner to the development of space and space-related weapons by any adversary and should support technology advances that will put the United States in a favorable strategic posture.

#### IV. NATIONAL FOREIGN INTELLIGENCE SECTOR GUIDELINES

a. The nature, the attributable collected information, and the operational detail of intelligence space activities

will be classified. As necessary to protect sensitive aspects, they will be controlled in special compartmented security channels as determined by the DCI. . . .

(1) As a matter of policy, the subject of satellite reconnaissance will not be discussed outside of classified channels. . . . The DCI will be the determining authority for release of space reconnaissance information.

\* \* \* \* \*

b. The DCI will continue to modernize and improve the National Foreign Intelligence Space Program. . . .

\* \* \* \* \*

e. Support of military operational requirements is a major space intelligence mission; national space intelligence assets shall provide appropriate support. In order to ensure a proper balance between the national and tactical missions of these assets, there will be military involvement in the requirements, taskings, exploitation, and dissemination functions, and in the development programs. The DCI will, together with the Secretary of Defense, ensure that there is no unnecessary overlap between the national foreign intelligence programs and DOD intelligence programs.

f. The DCI, together with the Secretary of Defense, may propose modifications or augmentations to military space systems necessary to support national foreign intelligence needs.

#### V. INTER-SECTOR GUIDELINES

\* \* \* \* \*

h. United States intelligence and military space sectors shall foster Government use of United States Government satellite imagery products, consistent with essential security requirements and user needs. The DCI will

continue efforts to facilitate the availability of classified imagery products outside of special control channels.<sup>17</sup>

\* \* \* \* \*

## BUSH (G. H. W.) DIRECTIVES

28. During his single term in office between 1989 and 1993, President George H. W. Bush signed five NSC space policy directives that warrant consideration.<sup>18</sup> The first one, National Security Directive 30 (NSD-30), *National Space Policy*, appeared on 2 November 1989; it superceded Reagan's NSDD-293 of the same title issued 22 months before, although the two are virtually identical. Like its predecessor, this directive encompassed all U.S. space "sectors," providing both the policy for these activities and guidelines to realize the policy. Also like its predecessor, the directive did not identify any sources of funding to achieve the policy objectives. Using almost identical wording, Bush emphatically endorsed the military and national foreign intelligence space sectors, which are of primary interest. Among six U.S. goals in space listed in this directive, "freedom of space" numbered second to last, although that position doubtless owed as much to international acceptance of the proposition as it did to any disinterest in it as a recognized legal principle.

## NATIONAL SPACE POLICY

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### II. GOALS AND PRINCIPLES

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<sup>13</sup> This authorization represented a commitment to continue passing sanitized reconnaissance imagery to other federal agencies in the civil sector. The imagery transfer began with the ARGO program in 1967 and it subsequently became a formal process with establishment of the Civil Applications Committee (CAC) in 1975 at the U.S. Geological Survey in Reston, Virginia.

<sup>18</sup> Two others, National Space Policy Directive 5 (NSPD-5), *Landsat Remote Sensing Strategy*, dated 5 February 1992, and National Space Policy Directive 7 (NSPD-7), *Space-based Global Change Observation* of 28 May 1992, are not germane and therefore are not considered in this study.

a. The overall goals of United States space activities are: (1) to strengthen the security of the United States; (2) to obtain scientific, technological and economic benefits for the general population and to improve the quality of life on Earth through space-related activities; (3) to encourage continuing United States private-sector investment in space and related activities; (4) to promote international cooperative activities taking into account United States national security, foreign policy, scientific, and economic interests; (5) to cooperate with other nations in maintaining the freedom of space for all activities that enhance the security and welfare of mankind; and, as a long-range goal, (6) to expand human presence and activity beyond Earth orbit into the solar system.

b. United States space activities shall be conducted in accordance with the following principles:

(1) The United States is committed to the exploration and use of outer space by all nations for peaceful purposes and for the benefit of all mankind. "Peaceful purposes" allow for military and intelligence-related activities in pursuit of national security and other goals.

(2) The United States will pursue military and intelligence-related activities in space in support of its inherent right of self-defense and its defense commitments to its allies.

(3) The United States rejects any claims to sovereignty by a nation over outer space or celestial bodies, or any portion thereof, and rejects any limitations on the fundamental right of sovereign nations to acquire data from space.

(4) The United States considers the space systems of any nation to be national property with right of passage through and operations in space without interference. Purposeful interference with space systems

shall be viewed as an infringement on sovereign rights.

(5) The United States shall encourage and not preclude the commercial use and exploitation of space technologies and systems for national economic benefit. These commercial activities must be consistent with national security interests, and international and domestic legal obligations.

(6) The United States will, as a matter of policy, pursue its commercial space objectives without the use of direct Federal subsidies.

(7) The United States shall encourage other countries to engage in free and fair trade in commercial space goods and services.

(8) The United States will conduct international cooperative space-related activities that are expected to achieve sufficient scientific, political, economic, or national security benefits for the nation. The United States will seek mutually beneficial international participation in space and space-related programs.

\* \* \* \* \*

## V. MILITARY SPACE POLICY

The United States will conduct those activities in space that are necessary to national defense. Space activities will contribute to national security objectives by (1) deterring, or if necessary, defending against enemy attack; (2) assuring that forces of hostile nations cannot prevent our own use of space; (3) negating, if necessary, hostile space systems; and (4) enhancing operations of United States and Allied forces. Consistent with treaty obligations, the military space program shall support such functions as command and control, communications, navigation, environmental monitoring, warning, tactical intelligence, targeting, ocean and battlefield surveillance,

and force application (including research and development programs which support these functions). In addition, military space programs shall contribute to the satisfaction of national intelligence requirements.

#### VI. NATIONAL FOREIGN INTELLIGENCE SPACE POLICY

The United States foreign intelligence program shall include a space program to acquire information and data required for the formulation and execution of foreign, military, and economic policies; to support the planning for, and conduct of, military operations; to provide warning; to support crisis management; to monitor compliance with treaty obligations; and to perform research and development related to these functions.

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#### POLICY GUIDELINES AND IMPLEMENTING ACTIONS

\* \* \* \* \*

#### III. MILITARY SPACE SECTOR GUIDELINES

##### a. General:

(1) The Department of Defense (DOD) will develop, operate, and maintain an assured mission capability through an appropriate mix of robust satellite control, assured access to space, on-orbit sparing, proliferation, reconstitution or other means.

(2) The military space program, including dissemination of data, shall be conducted to protect critical technologies and mission aspects in accordance with Executive Orders and applicable directives . . . .

(3) DOD will ensure that the military space program incorporates the support requirement of the Strategic Defense Initiative.

b. Space Support:

(1) Military and intelligence space sectors may use both manned and unmanned launch systems as determined by specific mission requirements. DOD, as launch agent for both sectors, will, in coordination with the Director of Central Intelligence (DCI), distribute payloads among launch systems and launch sites to minimize the impact of loss of any single launch system or launch site on mission performance.

. . .

(2) DOD will study concepts and technologies which would support future contingency launch capabilities.

c. Force Enhancement:

(1) The DOD, in coordination with the DCI as appropriate, will develop, operate, and maintain space systems and develop plans and architectures to meet the requirements of operational land, sea, and air forces through all levels of conflict commensurate with the intended use.

\* \* \* \* \*

d. Space Control:

(1) The DOD will develop, operate, and maintain enduring space systems to ensure its freedom of action in space and, upon appropriate direction, deny such freedom of action to its adversaries. . . .

(2) Anti-satellite (ASAT) Capability. The United States will develop and deploy a comprehensive capability including both kinetic and directed energy weapons. . . .

(3) DOD space programs will pursue a survivability enhancement program with long-term planning for future requirements. . . .

\* \* \* \* \*

e. Force Application. The DOD will, consistent with treaty obligations, conduct research, development, and planning to be prepared to acquire and deploy space weapon systems should national security conditions dictate. . . .

#### IV. NATIONAL FOREIGN INTELLIGENCE SECTOR GUIDELINES

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The following security guidelines apply to the conduct of these programs:

(1) As a matter of policy, the subject of satellite reconnaissance will not be discussed outside of classified channels. . . . The DCI will be the determining authority for release of space reconnaissance information.

\* \* \* \* \*

(5) Changes to the space intelligence security policy can only be authorized by the President.

29. (U) President Bush signed National Space Policy Directive 2 (NSPD-2), *Commercial Space Launch Policy*, on 5 September 1990. It called for establishing a free and fair market for launch services and goods, one in which U.S. industry could compete, and for government negotiations with the European Space Agency to define the principles for free and fair trade, and to limit certain government supports and unfair practices. The primary point, as it related to national security space operations, directed that all “U.S. Government satellites will be launched on U.S. manufactured launch vehicles unless specifically exempted by the President.”

30. On 11 February 1991, President Bush signed and issued National Space Policy Directive 3, *U.S. Commercial Space Policy Guidelines*. Under “Implementing Guidelines,” it directed “U.S. Government agencies [to] utilize commercially available

space products and services to the fullest extent feasible,” and that these agencies begin “using commercially available products and services in agency programs and activities” at the “earliest appropriate time.”

31. President Bush signed National Space Policy Directive 4 (NSPD-4), *National Space Launch Strategy*, on 10 July 1991. It revised and amplified the space launch strategy issued by President Reagan in the aftermath of the loss of Space Shuttle *Challenger* in 1986, and called for developing “a new unmanned, but man-rateable, space launch system to greatly improve national launch capabilities with reductions in operating costs and improvements in launch system reliability, responsiveness, and mission performance.”

#### NATIONAL SPACE LAUNCH STRATEGY

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### III. Strategy Guidelines

#### a. Existing Space Launch Capability

(1) A mixed fleet comprised of the Space Shuttle and existing expendable launch vehicles will be the primary U.S. government means to transport people and cargo to and from space through the current decade and will be important components of the nation’s launch capability well into the first decade of the 21<sup>st</sup> century.

(2) To meet U.S. government needs, agencies will conduct programs to systematically maintain and improve the Space Shuttle, current U.S. expendable launch vehicle fleets, and supporting launch site facilities and range capabilities. . . .

(3) As the nation is moving toward development of a new space launch system, the production of additional Space Shuttle orbiters is not planned. The production of space parts should continue in the near term to support the existing Shuttle fleet, and to pre-

serve an option to acquire a replacement orbiter in the event of an orbiter loss or other demonstrable need. . . . The Space Shuttle will be used only for those important missions that require manned presence or other unique Shuttle capabilities, or for which use of the Shuttle is determined to be important for national security, foreign policy, or other compelling purposes.

\* \* \* \* \*

b. New Space Launch System

(1) The Department of Defense and the National Aeronautics and Space Administration will undertake the joint development of a new space launch system to meet civil and national security needs. . . .

(2) The new launch system, including manufacturing processes and production and launch facilities, will be designed to support a range of medium to heavy-lift performance requirements . . . . While initially unmanned, the new launch system will be designed to be “man-rateable” in the future.

(3) The new launch system will be managed, funded, and developed jointly by the Department of Defense and the National Aeronautics and Space Administration. The development program will be structured in the near term toward the goal of a first flight in 1999.

. . .

\* \* \* \* \*

32. On 9 March 1992, as a presidential election neared, President Bush issued National Space Policy Directive 6 (NSPD-6), *Space Exploration Initiative*. Calculated to harness the space agency and Department of Defense for space projects that would rival Apollo, the initiative doubtless would have had major ramifications for the military and foreign intelligence space programs had not Congress declined to endorse the enter-

prise with the funding required. The initiative expired along with George H. W. Bush's failed attempt to secure a second term in office.

## SPACE EXPLORATION INITIATIVE

### I. Introduction

I have approved the next in a series of steps to be taken by the National Aeronautics and Space Administration (NASA), the Department of Defense (DOD), the Department of Energy (DOE), and other federal agencies regarding the planning for, and conduct of, the nation's Space Exploration Initiative (SEI) which includes both Lunar and Mars elements, manned and robotic missions and supporting technology. . . .

NASA is the principal implementing agency for the SEI. DOD and DOE, as participating agencies, will have major roles in support of the SEI in the conduct of technology development and concept definition. Other government agencies are encouraged to participate by developing activities supportive of the SEI.

### II. Exploration Responsibilities and Actions

To establish a firm foundation and clear direction for the SEI, the following actions shall be undertaken immediately:

(9) NASA shall establish an exploration office headed by the Associate Administrator for Exploration and staffed by NASA and representatives from other participating agencies. The Associate Administrator shall be responsible for architecture and mission studies, planning, and program execution, as well as the definition of resulting requirements for research, technology, infrastructure, mission elements and program implementation. . . .

\* \* \* \* \*

III. Exploration Guidelines

To insure that necessary preparatory activities are accomplished, the following steps shall be taken:

(a) The participating agencies shall address critical long-lead research and technology development activities which are supportive of the exploration strategic plan.

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(d) NASA, DOD, and DOE shall continue technology development for space nuclear power and propulsion while ensuring that these activities are performed in a safe and environmentally acceptable manner and consistent with existing laws and regulations, treaty obligations and agency mission requirements.

(e) NASA and appropriate participating agencies shall implement a definitive life science program in support of the human exploration of the Moon and Mars.

(f) All participating agencies should include space exploration in their respective educational programs. . . .

\* \* \* \* \*

CLINTON DIRECTIVES

33. President William J. Clinton issued four NSC space policy directives pertinent to this study during his term in office between 1993 and 2001.<sup>19</sup> He executed the first of these, Presidential Decision Directive/NSC-23, *US Policy on Foreign Access*

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<sup>19</sup> Presidential Decision Directive/NSTC-3, *Landsat Remote Sensing Strategy* of 5 May 1994, which authorized acquisition of a Landsat 7 spacecraft and continuation of the Landsat Program, is not considered here.

to *Remote Sensing Space Capabilities*, on 9 March 1994. It considered the likely prospect of foreign and domestic firms petitioning governments for permission to conduct high resolution remote sensing from space and set policy and licensing requirements and conditions for U.S. firms in this endeavor. With this policy, President Clinton formally approved the licensing of American companies to conduct commercial space imaging of the earth at a surface resolution of one meter.<sup>20</sup>

\* \* \* \* \*

#### Licensing and Operation of Private Remote Sensing Systems

License requests by US firms to operate private remote sensing space systems will be reviewed on a case-by-case basis in accordance with the Land Remote Sensing Policy Act of 1992 (the Act). There is a presumption that remote sensing space systems whose performance capabilities and imagery quality characteristics are available or are planned for availability in the world marketplace (e.g. SPOT, Landsat, etc.) will be favorably considered . . . .

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#### Transfer of Advanced Remote Sensing Capabilities

1. Advanced Remote Sensing System Export: The United States will consider requests to export advanced remote sensing systems whose performance capabilities and imagery quality characteristics are available or are planned for availability in the world marketplace on a case-by-case basis.

\* \* \* \* \*

#### Transfer of Sensitive Technology

The United States will consider applications in export sensitive components, subsystems, and information con-

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<sup>20</sup> See, e.g., Ivan Amato, *God's Eyes for Sale*, 102 (2) MIT TECH. REV. (Mar.- Apr. 1999).

cerning remote sensing space capabilities on a restricted basis because it is not in the national security interests of the United States to assist foreign nations or entities to attain autonomous capabilities. . . .

Government-to-Government Intelligence and Defense Partnerships

Proposals for intelligence or defense partnerships with foreign countries regarding remote sensing that would raise questions about US Government competition with the private sector or would change the US Government's use of funds generated pursuant to a US-foreign government partnership arrangement shall be submitted for interagency review.

Implementing Actions

-- The State Department, with the participation of the Secretaries of Defense and Commerce, the Director of Central Intelligence, the Chairman of the Joint Chiefs of Staff, and other members of the Executive Branch as appropriate, shall develop an approach to use with potential foreign suppliers of remote sensing space capabilities to discuss possible mutual constraints on foreign access for review by the Deputies Committee.

-- The State Department, with the participation of the Secretaries of Defense and Commerce and the Director of Central Intelligence and other members of the Executive Branch as appropriate, shall prepare a list of those remote sensing space technologies deemed to be sensitive. They shall ensure the list is updated on an annual basis.

34. On 5 May 1994, President Clinton signed Presidential Decision Directive/NSTC-2, *Convergence of U.S. Polar-Orbiting Operational Environmental Satellite Systems*. PDD/NSTC-2 formally combined United States military and civil low altitude polar orbiting meteorological satellite programs. When in the early 1960s NASA failed to produce a satisfactory weather satellite, the National Reconnaissance Office (NRO) secretly developed one to support the operations of its overhead, film-limited

photoreconnaissance systems. Made aware of this polar orbiting, low altitude weather satellite, the commerce department's Weather Bureau ordered near-carbon copies for its civil meteorological program. These two similar weather satellite programs proceeded in their separate worlds, only periodically molested by Congress, until 1992 when the defense department publicly acknowledged the existence of the NRO and a few "facts about" space reconnaissance. At that point, combining them, as ordered in this 1994 directive, became inevitable. The Department of Commerce's National Oceanographic and Atmospheric Administration assumed operational control of the combined program in May 1998.<sup>21</sup> On that date, Air Force Space Command's operational control of defense support space systems dropped from four programs to three, leaving to the service only military communication satellites, the Global Positioning System (GPS), and the missile early warning Defense Support Program (DSP).

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## II. Objectives and Principles

The United States will seek to reduce the cost of acquiring and operating polar-orbiting environmental satellite systems, while continuing to satisfy U.S. operational requirements for data from these systems. The Department of Commerce and the Department of Defense will integrate their programs into a single, converged, national polar-orbiting operational environmental satellite system. Additional savings may be achieved by incorporating appropriate aspects of NASA's Earth Observing System.

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## III. Implementing Actions

### a. Interagency Coordination

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<sup>21</sup> For a history of the military meteorological satellite program, see Hall, *A History of the Military Polar Orbiting Meteorological Satellite Program*, *supra* note 13.

1. Integrated Program Office (IPO)

The Departments of Commerce and Defense and NASA will create an Integrated Program Office (IPO) for the national polar-orbiting operational environmental satellite system no later than October 1, 1994. The IPO will be responsible for the management, planning, development, fabrication, and operations of the converged system. The IPO will be under the direction of a System Program Director (SPD) who will report to a triagency Executive Committee via the Department of Commerce's Under Secretary for Oceans and Atmosphere.

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35. On 5 August 1994, President Clinton signed Presidential Decision Directive/NSTC-4, *National Space Transportation Policy*. PDD/NSTC-4 superseded previous related directives and recast national space transportation policy and implementing actions for the 1990s to "sustain and revitalize U.S. space transportation capabilities."

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The United States space program is critical to achieving U.S. national security, scientific, technical, commercial, and foreign policy goals. Assuring reliable and affordable access to space through U.S. space transportation capabilities is a fundamental goal of the U.S. space program. In support of this goal, the U.S. Government will:

- (1) Balance efforts to sustain and modernize existing space transportation capabilities with the need to invest in the development of improved future capabilities;
- (2) Maintain a strong space transportation capability and technology base, including launch systems, infrastructure, and support facilities to meet the national needs for space transport of personnel and payloads;

- (3) Promote the reduction in the cost of current space transportation systems while improving their reliability, operability, responsiveness, and safety;
- (4) Foster technology development and demonstration to support future decisions on the development of next generation reusable space transportation systems that greatly reduce costs of access to space;
- (5) Encourage the cost-effective use of commercially provided U.S. products and services, to the fullest extent feasible, that meet mission requirements; and
- (6) Foster the international competitiveness of the U.S. commercial space transportation industry, actively considering the commercial needs and factoring them into decisions on improvements in launch facilities and launch vehicles.

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#### I. Implementation Guidelines

To ensure successful implementation of this policy, U.S. Government agencies will cooperate to take advantage of the unique capabilities and resources of each agency. This policy shall be implemented as follows:

- (1) The Department of Defense (DOD) will be the lead agency for improvement and evolution of the current U.S. expendable launch vehicle (ELV) fleet, including appropriate technology development.
- (2) The National Aeronautics and Space Administration (NASA) will provide for the improvement of the Space Shuttle system, focusing on reliability, safety, and cost effectiveness.
- (3) The National Aeronautics and Space Administration will be the lead agency for technology development and demonstration for the next generation re-

usable space transportation systems, such as the single-stage-to-orbit concept.

(4) The Departments of Transportation and Commerce will be responsible for identifying and promoting innovative types of arrangements between the U.S. Government and the private sector, as well as State and local governments, that may be used to implement application portions of this policy. . . .

(5) The Department of Defense and the National Aeronautics and Space Administration will plan for the transition between space programs and future launch systems in a manner that ensures continuity of mission capability and accommodates transition costs.

(6) The Department of Defense and the National Aeronautics and Space Administration will combine their expendable launch service requirements into single procurements when such procurements would result in cost savings or are otherwise advantageous to the Government. A Memorandum of Agreement will be developed by the Agencies to carry out this policy.

## II. National Security Space Transportation Guidelines

(1) The Department of Defense will be the launch agent for the national security sector and will maintain the capability to evolve and operate those space transportation systems, infrastructure, and support activities necessary to meet national security requirements.

(2) The Department of Defense will be the lead agency for improvement and evolution of the current expendable launch vehicle fleet, including appropriate technology development. . . .

(3) The objective of DOD's effort to improve and evolve current ELVs is to reduce costs while improving reliability, operability, responsiveness, and safety. . . .

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(4) The Department of Defense, in cooperation with NASA, may use the Space Shuttle to meet national security needs. Launch priority will be provided for national security missions as governed by appropriate NASA/DOD agreements. Launches necessary to preserve and protect human life in space shall have the highest priority except in time of national emergency.

(5) Protection of space transportation capabilities employed for national security purposes will be pursued commensurate with their planned use in crisis and conflict. . . .

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36. On 14 September 1996, shortly before election to his second term in office, President Clinton signed an omnibus *National Space Policy* directive. This directive, titled Presidential Decision Directive PDD/NSC-49 and PDD/NSTC-8, modified national space policy and, like President Reagan's directive before it, set guidelines for securing the policy objectives. (In this directive the terms "humankind" and "human space flight" replaced "mankind" and "manned space flight" entirely.) It also superseded a number of space policy and national security decision directives issued previously.

## NATIONAL SPACE POLICY

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### I. National Space Policy

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- (2) The goals of the U.S. space program are to:
  - (a) Enhance knowledge of the Earth, the solar system and the universe through human and robotic exploration;
  - (b) Strengthen and maintain the national security of the United States;
  - (c) Enhance the economic competitiveness and scientific and technical capabilities of the United States;
  - (d) Encourage State, local and private sector investment in, and use of, space technologies;
  - (e) Promote international cooperation to further U.S. domestic, national security and foreign policies.
  
- (3) The United States is committed to the exploration and use of outer space by all nations for peaceful purposes and for the benefit of all humanity. "Peaceful purposes" allow defense and intelligence-related activities in pursuit of national security and other goals. The United States rejects any claims to sovereignty by any nation over outer space or celestial bodies, or any portion thereof, and rejects any limitations on the fundamental right of sovereign nations to acquire data from space. The United States considers the space systems of any nation to be national property with the right of passage through and operations in space without interference. Purposeful interference with space systems shall be viewed as an infringement on sovereign rights.
  
- (4) The U.S. Government will maintain and coordinate separate national security and civil space systems where differing needs dictate. All actions undertaken by agencies and departments in implementing this directive shall be consistent with U.S. law, regulations, national

security requirements, foreign policy, international obligations and nonproliferation policy.

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### III. National Security Space Guidelines

(1) The United States will conduct those space activities necessary for national security. These activities will be overseen by the Secretary of Defense (SecDef) and the Director of Central Intelligence (DCI) consistent with their respective responsibilities as set forth in the National Security Act of 1947, as amended, other applicable law, and Executive Order 12333. Other departments and agencies will assist as appropriate.

(2) Improving our ability to support military operations worldwide, monitor and respond to strategic military threats and monitor arms control and nonproliferation agreements and activities are key priorities for national security space activities. The SecDef and DCI shall ensure that defense and intelligence space activities are closely coordinated; that space architectures are integrated to the maximum extent feasible; and will continue to modernize and improve their respective activities to collect against, and respond to, changing threats, environments and adversaries.

(3) National security space activities shall contribute to U.S. national security by:

- (a) providing support for the United States' inherent right of self-defense and our defense commitments to allies and friends;
- (b) deterring, warning, and if necessary, defending against enemy attack;
- (c) assuring that hostile forces cannot prevent our own use of space;

(d) countering, if necessary, space systems and services used for hostile purposes;

(e) enhancing operations of U.S. and allied forces;

(f) ensuring our ability to conduct military and intelligence space-related activities;

(g) satisfying military and intelligence requirements during peace and crisis as well as through all levels of conflict;

(h) supporting the activities of national policy makers, the intelligence community, the National Command Authorities, combatant commanders and the military services, other federal officials and continuity of government operations.

(4) Critical capabilities necessary for executing space missions must be assured. This requirement will be considered and implemented at all stages of architecture and system planning, development, acquisition, operation and support.

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(6) Civil, commercial and allied space systems may augment national security space activities. . . .

(7) The Department of Energy, in coordination with DoD, ACDA [Arms Control and Disarmament Agency], and the DCI will carry out research on and development of technologies needed to effectively verify international agreements to control special nuclear materials and nuclear weapons.

(8) Defense Space Sector Guidelines:

(a) DoD shall maintain the capability to execute the mission areas of space support, force enhancement, space control and force application.

(b) In accordance with Executive Orders and applicable directives, DoD shall protect critical, space-related technologies and mission aspects.

(c) DoD, as launch agent for both the defense and intelligence sectors, will maintain the capability to evolve and support those space transportation systems, infrastructure, and support activities necessary to meet national security requirements. DoD will be the lead agency for improvement and evolution of the current expendable launch vehicle fleet, including appropriate technology development.

(d) DoD will pursue integrated satellite control and continue to enhance the robustness of its satellite control capability. DoD will coordinate the other departments and agencies, as appropriate, to foster the integration and interoperability of satellite control for all governmental space activities.

(e) SecDef will establish DoD's specific requirements for military and national-level intelligence information.

(f) By agreement between the SecDef and the DCI, DoD has established procedures for transfer of tasking authority for national intelligence systems to the SecDef, as warranted by international crisis conditions in accordance with NSDD-204. The SecDef, in concert with the DCI, and for the purpose of supporting operational military forces, may propose modifications or augmentations to intelligence space systems as necessary. The DoD may develop and operate space systems to support military operations in the event that intelligence space systems cannot provide the necessary intelligence support to the DoD.

(g) Consistent with treaty obligations, the United States will develop, operate and maintain space control capabilities to ensure freedom of action in

space and, if directed, deny such freedom of action to adversaries. . . . The United States will:

-- develop a range of diplomatic, legal and military options to preclude an adversary's ability to use space systems or services for purposes hostile to U.S. national security interests.

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(h) The United States will pursue a ballistic missile defense program . . . .

(i) Consistent with treaty obligations, DoD may plan for and conduct research and development of advanced technologies for possible far-term space-based systems, including space-based lasers, to support the national missile defense deployment readiness program and, if directed, the acquisition and deployment of such systems should national security conditions dictate.

(j) Consistent with treaty obligations, DoD may plan for and conduct conceptual studies and other preliminary research and development to support possible advanced technologies in the force application mission area.

(9) Intelligence Space Sector Guidelines:

(a) The DCI shall ensure that the intelligence space sector provides timely information and data to support foreign, defense and economic policies; military operations; diplomatic activities; indications and warning; crisis management; and treaty verification and that the sector performs research and development related to these functions.

(b) The DCI shall continue to develop and apply advanced technologies that respond to changes in the threat environment . . .

(c) The DCI shall work closely with the SecDef to improve the intelligence space sector's ability to support military operations worldwide.

(d) The nature, the attributable collected information, and the operational details of intelligence space activities will be classified.

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#### CONCLUSION

On 15 February 1955, the Technological Capabilities Panel (TCP) presented its classified report to the National Security Council (NSC).<sup>22</sup> Formed by President Dwight D. Eisenhower in July 1954 to assess the threat of surprise atomic attack and recommend measures to improve U.S. defense preparedness, the panel consisted of the nation's leading scientists and engineers. A few months earlier, members of its intelligence group had urged the President to authorize construction of a reconnaissance airplane for extremely high altitude overflight of "denied territory." Although it would violate the territorial airspace of any nations surreptitiously overflown, in the interest of national security Eisenhower had approved the secret enterprise. Now, the intelligence group recommended beginning a scientific satellite program that would establish the principle in international law of "freedom of space." If the international community did not protest a scientific satellite circling the globe, it would set an overflight precedent for reconnaissance satellites that the TCP members likewise affirmed were sure to follow. Donald A. Quarles, at that time Assistant Secretary of Defense for Research and Development, seized on this passage and immediately solicited scientific satellite proposals through the National Science Foundation, and selected one for development in August, called Vanguard. In the meantime, Quarles prepared and

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<sup>22</sup> II, TECHNOLOGICAL CAPABILITIES PANEL, MEETING THE THREAT OF SURPRISE ATTACK, 147-48, at Part V (Washington, D.C., Feb. 14, 1955) (this section now declassified).

submitted to the NSC the national policy for the scientific satellite program, which President Eisenhower approved in May.<sup>23</sup>

NSC 5520, *Statement of Policy on U.S. Scientific Satellite Program*, authorized the project during the International Geophysical Year (IGY) in 1957-58, as the Technological Capabilities Panel had recommended. This first national space policy directive anticipated that “a small scientific satellite will prove a test of the principle of ‘Freedom of Space.’” Furthermore, although the scientific satellite “will have no direct intelligence potential, it does represent a technological step toward the achievement of the large surveillance satellite, and will be helpful to this end so long as the small scientific satellite program does not impede development of the large surveillance satellite.” The principle freedom of space, the core of Eisenhower’s space policy, made straight the way for operating future reconnaissance satellites. The essentials of this principle were adopted as Article I of the Outer Space Treaty brokered by the United Nations and signed and ratified by all major states in 1967. Because it ensured the free passage of reconnaissance satellites in outer space, freedom of space remained the primary focus of U.S. space policy until 1983.

On succeeding Eisenhower, President John F. Kennedy endorsed his predecessor’s space policy in 1962 with NSCA 2554, *Space Policy and Intelligence Requirements*. American reconnaissance satellites by this time had become vital national assets that absolutely had to be protected. A year earlier, in 1961, Kennedy’s Secretary of Defense designated a civilian office that Eisenhower had established in the defense department as the National Reconnaissance Office (NRO), responsible for the National Reconnaissance Program (NRP) that compassed all American overhead reconnaissance activities. Accordingly, Kennedy’s 1962 space policy focused on intelligence requirements and it underscored outer space as a free region open to the passage of all space vehicles, just as are the high seas open to the passage of all vessels on earth. It sought expressly to gain ac-

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<sup>23</sup> R. Cargill Hall, *The Eisenhower Administration and the Cold War, Framing American Astronautics to Serve National Security*, 27 (1) Q. OF THE NATIONAL ARCHIVES 63, at Prologue (Spring 1995).

ceptance for the legitimacy of “peaceful” space reconnaissance conducted under the umbrella of evolving international space law. And it held that any interference with or attacks on space vehicles of another country in peacetime was inadmissible and illegal. Finally, amplifying Eisenhower’s instruction in NSC 6108, which proscribed the testing of anti-satellite weapons without “specific” presidential approval, it declared that “no public attention should be directed toward development of anti-satellite capabilities, and any publicized demonstration of developmental work and any actual test of such a capability should require White House approval, with full account given to the adverse effects for our reconnaissance satellite program.”<sup>24</sup>

Presidents Lyndon Johnson and Richard Nixon issued six NSC space policy directives between them, all directed to fostering international cooperation in space affairs. And all of them turned on the principle freedom of space. But beginning in the 1960s, the Soviet Union conducted tests of an earth-based anti-satellite interceptor that, launched into a similar orbit with its intended target, approached it closely and destroyed the target satellite with shrapnel fired from a shaped charge.<sup>25</sup> Although limited in altitude (to low earth orbit) and in response time (one had to wait for the earth to turn into the proper position beneath the target satellite), the device nonetheless represented a distinct threat to American reconnaissance vehicles that operated at lower altitudes. Although the SALT I arms control treaty of 1972 formally recognized reconnaissance satellites and made Eisenhower’s Open Skies a reality, their unfettered operation appeared threatened again in 1976 when the Soviet Union resumed testing of co-orbital anti-satellite vehicles.<sup>26</sup> United States leaders feared that such vehicles, brought to operational

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<sup>24</sup> Shortly after issuing NSCA 2554, Kennedy’s defense secretary Robert McNamara cancelled an Air Force anti-satellite interceptor program, called SAINT, and, still later, the DynaSoar manned space plane that the Air Force in the 1950s originally had proposed as an intercontinental bombing platform.

<sup>25</sup> See Asif A. Siddiqi, *The Soviet Co-Orbital Anti-Satellite System: A Synopsis*, 50 (6) J. OF THE BRIT. INTERPLANETARY SOC’Y 225-40 (June 1997).

<sup>26</sup> CURTIS PEEBLES, *HIGH FRONTIER: THE UNITED STATES AIR FORCE AND THE MILITARY SPACE PROGRAM 65* (Air Force History and Museums Program, 1997), available at <http://stinet.dtic.mil/cgi-bin/GetTRDoc?AD=ADA442844&Location=U2&doc=GetTRDoc.pdf>, and SPIRES, *BEYOND HORIZONS*, *supra* note 8, at 188.

status, would be employed to “blind” NRP imaging satellites coincident with a surprise atomic attack on this country.

During a brief presidency, Gerald Ford issued two space policy directives aimed at countering this Soviet threat. NSDM 333, *Enhanced Survivability of Critical Space Systems* issued in July 1976, directed the Secretary of Defense and the Director of Central Intelligence (DCI) to prepare an action plan and submit funding requirements for systems to provide advance warning of an attack on critical U.S. satellites, verify direct interference with or attacks against them, and ensure a balanced level of survivability (install on board sensors to detect any interference, conduct evasive maneuvers, etc.) against a range of possible threats. In the introductory paragraph, the President judged “preserving the right to free use of space to be a matter of high national priority.” To counter directly the Soviet anti-satellite threat, on 18 January 1977 President Ford signed NSDM 345, *U.S. Anti-Satellite Capabilities*, which expressly called for the development of an American low altitude satellite interceptor. Responding to this directive, the U.S. Air Force subsequently did develop and successfully test a satellite interceptor rocket that could be launched from a jet fighter against satellites in low earth orbit. That effort died, however, when Congress refused to authorize the funds for an operational system.

In his single term of office between 1977 and 1981, President Jimmy Carter also issued two noteworthy space policy directives. The first of these, PD/NSC-37 *National Space Policy*, appeared in May 1978 and combined all U.S. space activities into a single directive (an action not taken since Eisenhower’s NSC 5918). Still more significant, for the first time it identified and defined in space policy a national military space program. Moreover, with the introduction of electro-optical imaging in 1977, both SIGINT and imaging reconnaissance satellites could provide national and military users near-real time data “live from space.” PD/NSC-37 emphasized the importance of space to U.S. military forces deployed in the field, and, also for the first time, directed that national space intelligence assets would support them.

To ensure that the NRP considered military operational requirements, PD/NSC-37 further specified “military involve-

ment” in all aspects of the program, and it instructed the Secretary of Defense and Director of Central Intelligence to avoid any unnecessary “overlap” between the National Foreign Intelligence Program (NFIP) and any DOD space reconnaissance programs. The Secretary of Defense subsequently implemented this space policy by establishing a Defense Reconnaissance Support Program (DRSP) in 1980, and, through the Secretary of the Air Force, a Defense Support Project Office (DSPO) to manage the DRSP in 1981.<sup>27</sup>

Even though PD/NSC-37 acknowledged NASA’s manned Space Transportation System (STS) as the nation’s preferred launch vehicle, it focused almost exclusively on military and intelligence space, and NSC staffing surely missed important segments of the civil space sector because this policy directive provoked disquiet at NASA. Consequently, the new president issued a second directive five months later, in October. His PD/NSC-42, *Civil and Further National Space Policy*, however, failed to meet the expectations of many at NASA who sought presidential endorsement of a vigorous program of manned space flight. Instead, PD/NSC-42 called for a balanced strategy of applications, science, and technology development among NASA programs, while proscribing any investment in manned space spectaculars, such as another effort like Project Apollo, or a permanently manned space station. It also approved the purchase of backup expendable launch vehicles as a prudent hedge in the event that NASA encountered difficulties with the manned STS then nearing flight tests. At NASA’s urging, however, Carter’s successor would reconsider these issues.

NASA leaders who preferred manned space flight found an advocate in President Ronald Reagan, who assumed office in January 1981. The United States fleet of four Space Transportation Systems (STS), each consisting of a rocket launch ensemble and the manned, reusable Space Shuttle orbiter, would not be

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<sup>27</sup> The Air Force Secretary named the Under Secretary of the Air Force, in his capacity as Director of the National Reconnaissance Office, as the official responsible for the “supervision and control of the Defense Support Project Office.” Memorandum from the Secretary of the Air Force to the Under Secretary, Subject: “Defense Reconnaissance Support Program (DRSP)” (Nov. 16, 1981) (on file with author).

declared operational in 1982. But Reagan's first space policy directive, NSDD-8, *Space Transportation System* issued in November 1981 dealt exclusively with it. Civil and military executive branch departments received emphatic notice that the STS would serve as the country's primary launch system for all government space vehicles. Reagan's subsequent, all-encompassing NSDD-42 *National Space Policy*, which he signed on the 4<sup>th</sup> of July 1982, mandated that the STS would launch all of the nation's space vehicles. Moreover, the United States would use expendable launch vehicles (ELVs) only until the "capabilities of the STS are sufficient to meet its needs and obligations," at which time ELVs would be phased out.<sup>28</sup> Accordingly, NSDD-42 directed that all government spacecraft be designed for launch on the STS, a change that introduced considerable cost increases for military and reconnaissance space programs then using ELVs. Finally, this policy directive, like those of Presidents Ford and Carter, authorized the development and deployment of anti-satellite weapons.

NSDD-42 also restated all of the basic military premises of Carter's PD/NSC-37, but added a separate section on Military Space Policy. Under Military Space Sector Guidelines, it identified and defined military space activities in a phylum preferred by the U.S. Air Force Space Command.

A year later in 1983, President Ronald Reagan publicly announced the beginning of the Strategic Defense Initiative (SDI), which introduced a major change in national space policy. His SDI policy directive, NSDD-119, issued on 6 January 1984, announced a focused technology development and demonstration program for land- *and* space-based weapon systems designed to intercept and destroy ballistic missiles in flight. It sought to reduce the risk of nuclear war through increased reliance on de-

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<sup>28</sup> Projections based on the findings of an "Interagency Space Policy Task Force I," composed of representatives of the Departments of State, Commerce, Interior, and Defense, the DCI and NASA, anticipated the phase-out of all ELVs during 1984, and, by 1988, that the four STS would be flying a *minimum* of 24 flights per year with projections of as many as 55 flights per year. See NASA Memorandum from John F. Yardley, Associate Administrator for Space Transportation Systems, to Arthur Morrissey, Office of Science and Technology, Executive Office of the President, C-8 at Figure 4 "ELV/Shuttle Traffic," *Report of the Space Policy Task Force No. 1* (July 20, 1978).

fensive strategic capabilities. But it represented a profound break with the intentions of American leaders who had first delineated national space policy to secure international acceptance of space reconnaissance, and who had relied on Mutual Assured Vulnerability as the primary deterrent to nuclear war. Whatever the reasons for this change, if space weapons were deployed, SDI portended serious implications for the National Reconnaissance Program.<sup>29</sup>

A *space-based* SDI system, however armed, could be used to deny access to outer space of other states by destroying their ascending launch vehicles, or it could restrict free passage through space by destroying selected satellites in orbit. Space-based weapons would be ideal instruments employed in a surprise attack if directed to disable the satellites of an adversary coincident with a first strike. Soviet leaders were advised, however, that such a system if actually deployed would only be used against missiles launched first against the United States. These assurances were earnestly and publicly given.<sup>30</sup> But no sentient American military commander would have accepted similar assurances from Soviet officials were their roles reversed. Thus it was not surprising to find Soviet military and civilian leaders equally dubious and uneasy.

Reagan's NSDD-144, *National Space Strategy*, which appeared a few months later on 15 August 1984, authorized the NRO to procure a "limited number" of ELVs for the National Reconnaissance Program as a hedge against unanticipated STS technical or operational problems. That action, vigorously opposed by NASA leaders, bid fair to end the STS monopoly on U.S. launch operations. But in a nod to the space agency, it also called upon NASA to field a permanently manned space station in orbit around the earth. (Initially projected for completion at an expenditure of some eight-to-ten billion dollars, its costs multiplied many times the original estimate, its schedules slipped monstrously, and an acceptable mission for it to perform failed

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<sup>29</sup> This policy issue is treated in R. Cargill Hall, *National Space and Defense Policies: Can They be Uncoupled?*, 39 (1) THE SPACE TIMES (May/June 2000).

<sup>30</sup> See, e.g., *Excerpts of the Gorbachev-Reagan Talks*, CNN INTERACTIVE, Oct. 11, 1986, <http://www.cnn.com/SPECIALS/cold.war/episodes/22/documents/reykjavikk/>.

to materialize. A scaled-down “International Space Station” remains unfinished in orbit at this writing, twenty-one years later.)

Reagan’s NSDD-164, *National Security Launch Strategy*, issued six months later on 25 February 1985, reconfirmed the STS as the American launch vehicle of choice and called on the struggling four-vehicle fleet to perform at its “target rate [of] 24 flights per year” to loft into space the nation’s civil, military, and intelligence satellites.<sup>31</sup> But it also authorized the Air Force to purchase a small number of ELVs as backups to the STS, which all but ended the long-simmering dispute between the defense department and NASA over the use of only one launch vehicle. Although conceived and built as a manned reusable “space truck” that could be quickly turned for its next mission, by 1985 the STS had proved itself a temperamental research and development vehicle for which NASA had ordered insufficient spare parts, one that required weeks of costly reconditioning before another mission could be mounted. Pressed to launch in unusually cold weather in Florida on 28 January 1986, one of Space Shuttle *Challenger’s* solid-propellant boosters exploded after liftoff resulting in the loss of the vehicle and all of its crew. On that event, the entire American space program came to a sudden, unexpected, and prolonged halt.

While government space program managers scrambled to place orders for expendable launch vehicles—and once again undertook the costly redesign of spacecraft to fly on them instead of the STS<sup>32</sup>—President Reagan issued NSDD-254, *U.S.*

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<sup>31</sup> See *supra* nn. 15 & 28. Back in 1969, a joint DOD-NASA committee submitted its study of the proposed STS to the President’s Space Task Group. The STS, it reported, required no significant advances in technology and could become operational in 1976 for a total cost of four-to-six billion dollars. Moreover, by the time a desired fleet of five had flown 100 missions, the launch costs would decrease to \$100-to-\$500 per pound delivered into low earth orbit, and \$500 per pound delivered to geosynchronous orbit. See JOINT DOD/NASA STUDY OF SPACE TRANSPORTATION SYSTEMS, SUMMARY REPORT, NASA History Reference Collection #1709 (Grant Hansen, Assistant Air Force Secretary for R&D, and George Mueller, Assistant NASA Administrator for Manned Space Flight, eds., June 16, 1969). As of June 2005 the approved STS fleet of four (now three) had flown 113 missions, with current costs in the neighborhood of one-half billion dollars for each flight.

<sup>32</sup> According to a defense department accounting, the redesign of military and national reconnaissance spacecraft to launch on the STS instead of ELVs that began in the

*Space Launch Strategy*, on 27 December 1986. It reversed completely the commitment to the STS as the nation's primary launch vehicle and instead called for the purchase of more expendable launch vehicles to complement the manned space rocket, and for the building of additional complexes to launch them. It also approved procurement of a replacement fourth Space Shuttle orbiter. Thirteen months later, on 5 January 1988, Reagan concluded his space policy directives with NSDD-293, *National Space Policy*. Once again it embraced all four primary space sectors, civil, military, intelligence and commercial, and included "implementing procedures" to execute the policy prescribed for them.

President George H. W. Bush issued five NSC space policy directives during his single term in office between 1989 and 1993, not including one on *Space-based Global Change Observation*. Four of them essentially fine-tuned the directives of his predecessor. For example, NSD-30 *National Space Policy*, issued in November 1989, added points covering commercial space policy and separated the Top Secret material contained in Reagan's NSDD-293 into an annex, which reduced the classification of NSD-30 to Secret. In a significant departure from previous policy that focused on earth-orbiting systems, in 1992 Bush issued NSPD-6, *Space Exploration Initiative*, which directed a vast, long term deep space enterprise and made institutional assignments for "manned and robotic missions and supporting technology" to explore the Moon and Mars. Although the proposed policy doubtless pleased NASA leaders, their congressional counterparts were not persuaded and funding for the SEI, as it became known, was not forthcoming. On the election of William J. Clinton as President a few months later, other priorities eclipsed SEI and, like a spacecraft once placed in orbit, it disappeared from public view.

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late 1970s, and the reconfiguring of them again to launch on ELVs instead of the STS after the *Challenger* accident later in the 1980s, "cost the DoD in excess of \$20 billion." Additionally, its authors added for those readers who might be mentally challenged, "mission accomplishment was adversely affected." DEPARTMENT OF DEFENSE TRANSITION STRATEGY FOR THE NATIONAL LAUNCH SYSTEM 3, approved, D. L. Atwood (July 27, 1992).

President William J. Clinton issued three space policy directives that warrant attention. The first, issued on 9 March 1994, PDD/NSC-23 *US Policy on Foreign Access to Remote Sensing Space Capabilities*, allowed under its terms and subsequent statute law the licensing of private firms to conduct imaging of the earth from space at a resolution of one meter. This policy would have a profound effect on the National Reconnaissance Program in the years that followed, when the government began purchasing a large amount of commercial imagery of the earth. It allowed NRP satellites to be directed to image only sites on earth of primary national interest. The second policy, PDD/NSTC-2 *Convergence of U.S. Polar-Orbiting Operational Environmental Satellite Systems* issued in August 1994, combined into one program the civil and military low altitude meteorological satellite systems under the control of the commerce department's National Oceanographic and Atmospheric Administration. That action marked the end of a separate military space program that began at the National Reconnaissance Office thirty-five years before. Two years later in 1996, Clinton issued his Secret *National Space Policy*, PDD/NSC-49. This transcendent directive contained guidelines for each space sector as well as inter-sector guidelines, and it addressed arms control, space nuclear power, and space debris. Like other overarching post-Carter space policy directives, reconnaissance space assets, though limited in kind and numbers, were tasked to satisfy all "military and intelligence requirements during peace and crisis as well as through all levels of conflict." But again, the funding needed to secure the numerous mandated defense objectives in space remained problematic.

For fifty years, between 1955 and 2005, a few basic principles have undergirded the space policy of the United States—principles enumerated in presidential NSC directives from Eisenhower to Clinton. During this period they have remained remarkably consistent, with the United States pledged to:

- Freedom of space, that is, free access to and unimpeded passage through space for the satellites of any nation during times of peace.

- Explore and use outer space for “peaceful purposes” for the benefit of all mankind. (Peaceful purposes in the 1950s was [and remains today] interpreted as allowing defense support and intelligence-related space activities in pursuit of national security.)
- Reject any claims to sovereignty over outer space or over celestial bodies, and to any limits on the fundamental right to acquire data from space.
- Pursue three separate albeit interrelated government space programs: civil, military, and intelligence.
- Respect the space systems of any nation as national property with the right of passage through and operation in space without interference. Purposeful interference with operational space systems is viewed as an infringement on sovereign rights.
- Conduct if necessary activities in outer space in support of its right of self defense.

The goals or objectives of the three national space programs have varied over time with the interests of the respective presidents. Succeeding directives have identified them as strengthening the security of the United States, maintaining United States space leadership, expanding private-sector investment in space-related activities, promoting international cooperative space activities, expanding human presence and activity beyond earth into the solar system, and obtaining scientific, technological, and economic benefits for the general population, among others. But it is the last space policy principle that in recent years has prompted significant military efforts at developing technology for space-based weapon systems.

Nevertheless, when formulating military space missions and doctrine, defense officials should consider carefully the history of national reconnaissance and military space programs, *and* the evolution of space law and national space policy. Although conventional military wisdom holds that military astronautics will repeat aeronautical experience (space reconnais-

sance followed by orbiting offensive weapon systems), I am not persuaded that this evolution is slaved to that precedent. First, in the absence of any threat from an avowed “space adversary,” I think it most unlikely that military astronautics will transpire in this fashion. Second, and obvious even to the casual observer, outer space is a *radically* different physical regime than air-space—Star Wars films and Air Force arguments in favor of an air-space continuum notwithstanding. Third, the technical complexity, reliability, and “*cost ineffectiveness*” of space-based weapons (compared with earth-based weapons), all represent monumental, though not insurmountable, impediments. Finally, to secure approval *and* funding for space-based weapons, *both* the legislative and executive branches of the government must agree on them. For these reasons, military space flight will evolve differently than its aeronautical counterpart. Just how much differently it may evolve I cannot say, but, given the remarkable advances in robotics, it is reasonable to believe that “man in space” will not play a serious military role in the foreseeable future.<sup>33</sup>

Finally, whatever the prospects for space-based weapons, space reconnaissance unquestionably is (and will remain) a vital element in the nation’s war against Islamic terrorists in the 21<sup>st</sup> century. And “freedom of space”—the international right of free access to and passage through outer space—is the indispensable guarantor of that acknowledged mission. It will remain the cornerstone of United States space policy for the foreseeable future. I expect that American leaders in either the legislative or executive branches of the government will judge unacceptable any serious attempt at home or abroad to deny this first space principle, which would place at risk those crucial space assets upon which the United States relies so heavily in peace and war.

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<sup>33</sup> The projection of future events in the near-term, and in specific areas in broad gauge outline, is a reasonable proposition if one does the necessary historical homework. See, for example, R. Cargill Hall, *Comments on Salvage and Removal of Man-made Objects from Outer Space*, 33 J. AIR L. & COM. (1967).



## WHAT IS “INFORMED CONSENT” FOR SPACE-FLIGHT PARTICIPANTS IN THE SOON-TO-LAUNCH SPACE TOURISM INDUSTRY?

*Tracey Knutson\**

*It's a dangerous business, Frodo, going out your door. You step onto the road, and if you don't keep your feet, there's no knowing where you might be swept off to.*

J. R.R. Tolkien

Or, stated another way, what exactly do the commercial space tourism companies have to tell you *before* you pay your money, agree to fly with them and board one of their space liners? On December 15, 2006, the FAA/AST<sup>1</sup> published the Final Rule on Human Space Flight Requirements for Crew and Space Flight Participants as it had been statutorily required to do by Congress in the Commercial Space Launch Amendments Act (“CSLAA”) of 2004.<sup>2</sup> The FAA/AST’s final rule, which became

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<sup>1</sup> The 1984 Commercial Space Launch Act established the Department of Transportation (“DOT”) as the Federal Agency responsible for regulating and overseeing the private commercial launch vehicle industry. *See* 49 U.S.C. § 2604 (1984). In 1984, DOT established the Office of Commercial Space Transportation (“OCST”) which reported to the Secretary of Transportation; then in 1995 OCST oversight was delegated to the FAA Administrator who created the Office of the Associate Administrator for Commercial Space Transportation (now, “AST”). Currently the FAA/AST has oversight and regulatory authority for this industry. The FAA’s authority to issue rules regarding commercial human space flight is found at 49 U.S.C. § 70101(a)(13).

<sup>2</sup> Commercial Space Launch Amendments Act of 2004, Pub. L. No. 108-492, 118 Stat. 3974 (2004) [hereinafter CSLAA]; Human Space Flight Requirements for Crew and

effective on February 13, 2007, expressly states in the Description of Final Rule and Discussion of Comments that “...before receiving compensation *or* agreeing to fly a space flight participant, an operator must inform each space flight participant *in writing* about the risks of the launch and reentry vehicle type. For each mission an operator must inform a space flight participant, *in writing*, of the known hazards and risks that could result in a serious injury, death, disability or total or partial loss of physical and mental function....[and] an operator should inform a space flight participant that there are also unknown hazards.... The operator also must disclose that participation in space flight may result in death, serious injury, or total or partial loss of physical or mental function. An operator must inform each space flight participant that the United States Government has not certified the launch vehicle and any re-entry vehicle as safe for carrying crew or space flight participants.”<sup>3</sup> (Emphasis added.) This constellation of warnings the operators must give the space flight participants (“SFPs”) is what Congress and the FAA/AST are calling “informed consent.”<sup>4</sup> Bottom line is that, by federal regulation, the space flight operators (“operators”) have to give the SFPs a series of written warnings on risks *before* they take your money, agree to fly you to dark space (or wherever...) and then take you aboard one of their space liners. But, what constitutes a complete or fair warning? What risks do they have to warn you about? How far do the warnings have to go? What *exactly* have the federal statute and regulations mandated as between the operator and the SFP? And please know, it’s fair to say that even the developing space tourism industry is asking these questions. So, to answer this question, first consider the following.

The CSLAA set out a goal of “safely” opening space to the American people and private enterprises.<sup>5</sup> In drafting the CSLAA, Congress found that: space transportation is “inher-

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Space Flight Participants, Final Rule, 14 C.F.R. Parts 401, 415, 431, 435, 440 and 460 (2006).

<sup>3</sup> 14 C.F.R. § 460.45 (2006).

<sup>4</sup> 14 C.F.R. § 460.65 (2006); 49 U.S.C. § 70105(b)(5)(A-C) (Supp. 2004).

<sup>5</sup> 49 U.S.C. § 70101(a)(10) (Supp. 2004).

ently risky" and that the public interest would be served by creating a "clear legal, regulatory and safety regime."<sup>6</sup> Congress also said that launch licensees/permittees (the operators) would have to obtain written "informed consent" from SFPs.<sup>7</sup> And then Congress said that the FAA/AST (through the Secretary of Transportation) "may" issue safety regulations in the event of a serious or fatal incident and "may" propose additional regulations 8 years after passage of the CSLAA.<sup>8</sup> Now let's get all of the apples and oranges (or contradictions here...) straight. Because Congress hasn't or didn't adopt a Federal tort regime for human spaceflight, the FAA/AST Final Rule takes a hands-off wait-and-see approach to regulating safety issues between the operator(s) and the SFPs (apple).<sup>9</sup> But Congress also said that the public interest would be served by a clear legal regulatory and *safety* regime (orange).<sup>10</sup> Additionally, while Congress said that the goal of the CSLAA is to *safely* open space to the American people (apple) it then went on to say that space transportation is inherently risky (orange).<sup>11</sup> Again, because Congress didn't adopt a tort regime for human space flight, the FAA/AST's Final Rule really only protects 2 groups: the uninvolved public and the U.S. Government (apple). There are no

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<sup>6</sup> *Id.* § 70101(a)(12 & 14).

<sup>7</sup> *Id.* § 70105(b)(5)(A-C).

<sup>8</sup> *Id.* § 70105(c)(4).

<sup>9</sup> See 49 U.S.C. § 70101(a)(15) (Supp. 2004) wherein Congress states that regulations must evolve as the industry matures so that regulations don't stifle technology development. Additionally, FAA/AST discusses Risk to Space Flight participants and notes:

[A]s the FAA noted in the NPRM, the CSLAA does not provide the authority to protect space flight participants except in certain circumstances. 49 U.S.C. 70105(c); 70 FR at 77270. The CSLAA only allows the FAA to issue regulations restricting or prohibiting design features or operating practices that result in a human space flight incident or a fatality or serious injury to space flight participants during an FAA authorized flight until December 23, 2012. For the next six years, the FAA has to wait for harm to occur before it can impose restrictions. Instead, Congress requires that space flight participants be informed of the risks. To that end, the FAA is establishing notification requirements.

FAA, Human Space Flight Final Rule, 70 Fed. Reg. 75615, 75624, at II(C)(1) (2006) (on Launch and Re-entry With a Space Flight Participant).

<sup>10</sup> 49 U.S.C. § 70101(a)(14) (Supp. 2004).

<sup>11</sup> *Id.* § 70101 (a)(12).

real safety requirements or protections given to the SFPs in this Rule and very little that is *required* of the operators in conducting their relationships with the SFPs (orange).<sup>12</sup> With respect to SFPs, the commercial human space flight industry is not required to obtain medical clearance on the passengers and must only give the written warnings noted above and obtain the participant's written consent to participate.<sup>13</sup> The written "informed consent" is largely defined as "information" about the risks of the activity and the safety history of human space vehicles; but note that the regulations also require what appears to be safety type discussions or question and answer sessions.<sup>14</sup> These two things, written consent and oral questioning of the operator, are clearly intended to achieve some type of "cognizance test" or "...affirmation that the space flight participant understands what he or she is getting into before embarking on a mission."<sup>15</sup> (Big orange). There is no doubt that Congress and the federal oversight agency are trying to establish a "risk shifting" regime as between the SFP and the operator *if* adequate information is delivered from the operator to the SFP. As the Associate Administrator of the FAA/AST said recently in public comments regarding the Tenth Annual FAA Commercial Space Transportation Conference's focus on safety and on-going vehicle development and design, "...one step at a time until you have a vehicle....*that convinces the passenger* the risk is worth taking."<sup>16</sup> (Emphasis added.) So, looking at the apples and oranges, do the "informed consent" requirements in the Federal statute and regulations mean its now "safe" to open human space flight to commercial endeavors?

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<sup>12</sup> See *supra* note 8.

<sup>13</sup> See *generally*, 14 C.F.R. § 460.45 (2006).

<sup>14</sup> The Final Rule issued by the FAA/AST also requires that before actual flight, licensed operators must also give SFP's an opportunity to orally ask questions to enable them to better understand the hazards and risks of the "mission." *Id.* at (f).

<sup>15</sup> Again, see Human Space Flight Final Rule, *supra* note 9, at II(C)(2)(a) (on the space flight participant's ability to be informed).

<sup>16</sup> Remarks by Patti Grace Smith, Associate Administrator for the Federal Aviation Administration Office of Commercial Space Transportation, to the Center for Strategic and International Studies in Washington D.C., Mar. 28, 2007, *available at* [http://www.faa.gov/about/office\\_org/headquarters\\_offices/ast/about/speeches\\_testimony/](http://www.faa.gov/about/office_org/headquarters_offices/ast/about/speeches_testimony/).

Which brings us back to the primary question...what exactly is "informed consent" and what DO the operators have to tell you before they take your money and book you on one of their flights? While the CSLAA requires operators to obtain written "informed consent" from SFPs, this author takes a particular view of that phrase. It is first important to understand that Congress expressly stated that this emerging industry was not to be viewed as highly regulated transportation like the airline industry but rather was comparable to adventure travel;<sup>17</sup> Congress even went so far as to compare the participants to daredevils, visionaries and adventurers.<sup>18</sup> In the adventure sport context then, there are a number of different operator-participant documents or warning terms of art that are used (including release and waiver contracts, participation agreements, informed consent, etc.) and it is important to distinguish among them. Informed consent documents derive most commonly from medical or therapeutic regimes and these documents record that treatment risks have been disclosed and consent to the treatment has been obtained.<sup>19</sup> If appropriate consent is in place then the medical or therapeutic provider has some protection from the "inherent risks" of the treatment, but no

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<sup>17</sup> See 14 C.F.R. Parts 401, 415, et al. Human Space Flight Requirements for Crew and Space Flight Participants, Proposed Rule, 70 Fed. Reg. 77261, 77269, at § II(B)(1) [hereinafter Proposed Rule] (wherein the FAA/AST expressly states that the CSLAA characterization of "Space Flight Participant" "...signifies that someone on board a launch vehicle or re-entry vehicle is not a typical passenger with typical expectations of transport, but someone going on an adventure ride.") This section of the Proposed Rule also quoted Michael Kelly as characterizing "the experience as an adventure ride." *Id.* Additionally, the Proposed Rule stated that "[O]thers have compared it to mountain climbing, skydiving, not wearing a helmet while riding a motorcycle, and other risky endeavors." *Id.*

<sup>18</sup> See Timothy Robert Hughes & Esta Rosenberg, *Space Travel Law (and Politics): The Evolution of the Commercial Space Launch Amendments Act of 2004*, 31 J. SPACE L. 1, at 46 (2005) (stating that Rep.(s) Boehlert and Rohrbacher testified, respectively, in the Congressional Record that the commercial human space flight industry, "...is like a baby in its crib..." and the "...industry is at the stage when it is the preserve of visionaries and daredevils and adventurers...who will fly at their own risk [and]...who do not expect and should not expect to be protected by the government." *Id.*

<sup>19</sup> See generally, DOYCE J. COTTON & JOHN T. WOLOHAN, *LAW FOR RECREATION AND SPORTS MANAGERS*, 114, at ch. 2.24 (Kendall/Hunt Publishing Co., Dubuque, Iowa, 3d., 2003) (on Inherent Risk Related Defenses: Informed Consent Agreements & Agreements to Participate).

protections from negligence.<sup>20</sup> What makes informed consent unique is that something is *done to* the participant by another party (usually the medical provider) with the participant's consent. In contrast, in the true adventure sport activity, the participant agrees to participate in a purely voluntary activity and the participant will have the same "duty" as the operator – to act like a reasonably prudent person in whatever circumstance is presented.<sup>21</sup> Nothing is done *to* the participant. Because recreational or adventure activities are seen as voluntary, courts by and large hold that there is no public policy which prohibits a participant from releasing or contractually exculpating an operator – in advance – for not only liabilities associated with the inherent risks of the activity, but also for the operators' simple negligence.<sup>22</sup> After reviewing some of the Congressional history associated with passage of the CSLAA of 2004,<sup>23</sup> it is fairly clear to the author that Congress' real concern here was not in presenting the infant space flight industry as a provider setting out to "do" anything to participants but rather as a young industry that had no established community standards or customary practices so that the importance of warning participants of the risks and dangers was very recognizable. For this reason, I believe that Congress intended to impose on operators a statutory or codified "duty to warn" when it used the phrase "informed consent" and this is how the issues surrounding what an operator must tell a putative SFP before flying are discussed in this article.

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<sup>20</sup> *Id.*

<sup>21</sup> This is the basis of what the law calls "contributory" or "comparative" fault, which means that the legal duty to act reasonably in any given situation literally runs both ways between the participant and the operator. In other words, legally speaking, both the participant and the operator have the legal duty to act reasonably given the situation they are in, and they can both bear fault and corresponding liability. See *e.g.*, *Smith v. North Carolina DNR*, 436 S.E. 2d 878 (N.C. App.1993); *Voight v. Colorado Mountain Club*, 819 P. 2d 1088 (Colo. App. 1991).

<sup>22</sup> See Knutson & Assoc., *Defenses to Negligence Claims: Release and Waiver Documents (Including What Needs to be In These Documents and How To Properly Administer Them)*, in STATE OF RISK - RISK MANAGEMENT IN THE OUTDOOR INDUSTRY, at ch. 7(a), and attachment DVD: Law of All 50 States on Use of Release and Waiver Documents, <http://www.traceyknutson.com> (last visited Aug. 10, 2007).

<sup>23</sup> This history is presented in remarkable detail in Hughes & Rosenberg, *supra* note 18.

So, again, what type of discussion or information will the operator have to provide in order to effectuate the legal shift of risk (and therefore liability) back to the SFP? According to the common law on recreational style negligence<sup>24</sup> as it has developed around the country, it is fair to say that the *standard of care* for commercial recreation or adventure sport operators is that they have a *duty* to inform guests of the risks that they are taking in participating in an activity.<sup>25</sup> In fact, warning is one of the most critical duties adventure sport operators owe to their clients; and, warnings will be one of the most important aspects of defense. When we think of a *standard of care and/or a duty* we are looking at what a reasonably prudent guide or instructor or operator should do under the circumstances of any given activity to protect or minimize/mitigate the risks a client encounters. It is clear that explaining/instructing/warning is really the foundation of minimizing or mitigating risks associated with any activity.<sup>26</sup> Thus, the "standard of care" anticipates that a

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<sup>24</sup> Negligence under the law is generally defined as the failure to use ordinary care; that is, failing to do what a person of ordinary prudence would have done under the same or similar circumstances. Essentially we are looking to determine whether an operator, guide or land administrator could or should have recognized an unreasonable risk and then did nothing to warn the participant/student or to reduce or eliminate the unreasonable risk. To examine negligence in behavior or conduct, look for two things: was the risk foreseeable and was the risk unreasonable. See COTTON & JOHN T. WOLOHAN, *supra* note 19, at ch. 2.10 (on Negligence Law).

<sup>25</sup> Duty generally refers to one party's responsibility to take reasonable care for the protection of another party. Duty has three primary origins: 1.) from a relationship inherent in the situation; 2.) from a voluntary assumption; or 3.) from a duty mandated by a statute or regulation of some sort. See generally, COTTON & JOHN T. WOLOHAN, *supra* note 19, at ch. 2.11 (on Elements of Negligence). See also, *Licato v. Eastgate*, 499 N.Y.S. 2d 472 (A.D. 3 Dept. 1986); *Saffro v. Elite Racing Inc.*, 98 Cal. App. 4<sup>th</sup> 173 (Ct. App. California, May 7, 2002)(rev. denied, 2002 Cal. Lexis 5268 (July 2002)).

<sup>26</sup> Think of standard of care or breach of the standard of care as the "act or omission" - the thing that was done or not done - looking at what the guide or instructor (or space flight operator) did or did not do to protect a participant/client that was not in accord with what a reasonably prudent guide or instructor should do under those circumstances. Generally, determining what a reasonable person would have done under the circumstances is establishing the standard of care. Again, standards may be set by statute, ordinance or regulation or by the profession. A standard of care will take into account who is delivering the service and what their level of knowledge should be - in other words, the standard will be what would be expected of a reasonable and careful person carrying out the same activity (i.e. - a reasonable guide, instructor, etc.). The standard of care then, for a professional person, is that degree of care that is shown by a reasonably prudent practitioner operating in like or similar circumstances. So, it becomes crucial to understand established professional customs and practices in your field.

reasonable and prudent operator carrying out the same activity will inform a participant of the risks.

After a period of time in any sport, both the participants and the operators begin to understand the processes necessary to minimize or mitigate the risks and how the risks and the acts of minimizing the risks should be explained. As such, *industry standards* begin to form and become articulated. As it relates to what a current commercial space adventure or tourism operator should tell you before they book you onto one of their space flights, this is exactly one of the conundrums of new activities or sports, including commercial human space flight – because the full range of risks are not yet realized, there are not articulated or developed standards, policies and procedures or warnings regarding risks and how those risks are minimized. Moreover, because there will be so few viable operators (competition to survive the formation period is more intense at this stage) in the nascent period of any sport, ideas and experiences are not readily shared or agreed upon so that accepted standards will not easily coalesce amongst operators. Without accepted standards, mitigation processes and effective warnings *are* difficult to articulate. It is fairly clear already in the young space tourism industry that, given humankind's overall very limited history in space,<sup>27</sup> the stagnation of the old official government space industry,<sup>28</sup> the lack of a proven safety record to date of experimental or research type rocket planes<sup>29</sup> and the simple disparity in

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See Catherine Hansen-Stamp & Charles R. (Reb) Gregg, eds., *The Elusive "Reasonable Person"*, THE OUTDOOR EDUCATION AND RECREATION LAW Q. (Spring 2001); ROSS CLOUTIER ET AL., LEGAL LIABILITY AND RISK MANAGEMENT IN ADVENTURE TOURISM 16-17, at ch. 2 (on tort law) (Bhudak Consultants, Kamloops, British Columbia, 2000).

<sup>27</sup> See Jeffrey F. Bell, *Rocket Plane Roulette*, SPACE DAILY, Mar. 7, 2007, [http://www.spacedaily.com/reports/Rocket\\_Plane\\_Roulette\\_999.html](http://www.spacedaily.com/reports/Rocket_Plane_Roulette_999.html) (discussing the flight history of experimental rocket planes).

<sup>28</sup> *Id.* See also, GREG KLERKX, LOST IN SPACE: THE FALL OF NASA AND THE DREAM OF A NEW SPACE AGE (Vintage Books, 2004). See also, Robert W. Poole Jr., *Is This Any Way to Run Space Transportation*, in EDWARD L. HUDGINS, SPACE: THE FREE-MARKET FRONTIER, at part 2, ch. 4 (Cato Institute, 2002).

<sup>29</sup> See Bell, *supra* note 27 (stating that: "For a prospective space tourist, the relevant record for suborbital rocket planes is: 8 life threatening accidents in 458 flights, for a loss rate of 1 in 57." Also stating, "[T]he fatal crash rate will be at least 1 in 200 and probably more like 1 in 50."); see also, Laura Montgomery, *Space Tourism and Informed Consent: To Knowingly Go*, TRANSLAW (Spring 2004) (citing the Columbia Accident

vehicles currently being developed that standards are a long way off.<sup>30</sup>

Bringing this explanation back to the question of what a commercial space flight operator should tell a SFP before booking him or her on one of these as yet unscheduled flights, the starting point is the simple knowledge that commercial human space flight entrepreneurs are legally (if not morally)<sup>31</sup> *duty* bound (both by common law principles associated with the "duty to warn" in adventure sports and now by Congress' codification of that duty as "informed consent")<sup>32</sup> to explain to their space-faring customers *all* of the risks associated with this activity.<sup>33</sup> The more focused question then becomes what a reasonably prudent operator should tell a potential SFP about the myriad risks associated with commercial spaceflight?

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Investigation Board report of August 2003 which stated that launch vehicles have a 14.6 percent failure rate).

<sup>30</sup> On this last point, then, it is clear why the FAA/AST has taken a hands off approach to regulation; absent further development, *what* pray tell, *is* there to regulate?

<sup>31</sup> It is worth noting that "tort" law is primarily concerned with compensation for fault based accidents. Based on the specific facts in any given case, courts rule on who is at fault in order to award compensation; or, legislatures will respond to societal conditions and codify ideas regarding duty and fault. These common law court rulings and legislative enactments result in pronouncements of standards of care, essentially making statements as to appropriate societal values. For discussions on these concepts, see COTTON & JOHN T. WOLOHAN, *supra* note 19, at 56 – 57, ch. 2.10 (on Negligence Theory); CLOUTIER, *supra* note 26, at 12, ch. 2 (on Tort Law).

<sup>32</sup> On common law warnings, see *Pell v. Victor J. Andres High School and AMF, Inc.*, 462 N.E. 2d 858 (Ill. 1984), *Bucheleres v. Chicago District Park*, 646 N.E. 2d 1326 (Ill. App. 1 Dist 1995), *Ewell v. United States*, 579 F. Supp. 1291 (D. Utah 1984); see also RESTATEMENT (THIRD) OF TORTS § 2 & Related Comments (1997) finding that adequate obvious warnings from product manufacturers are necessary but may not provide a complete legal defense. See also, *supra* notes 3 & 4.

<sup>33</sup> The specific wording used in CSLAA is: "...before receiving compensation or agreeing to fly a space flight participant, an operator must inform each space flight participant *in writing* about the risks of the launch and reentry vehicle type. For each mission an operator must inform a space flight participant, *in writing*, of the known hazards and risks that could result in a serious injury, death disability or total or partial loss of physical and mental function...[and] an operator should inform a space flight participant that there are also unknown hazards.... The operator also must disclose that participation in space flight may result in death, serious injury, or total or partial loss of physical or mental function. An operator must inform each space flight participant that the United States Government has not certified the ... vehicle as safe for carrying crew or space flight participants." CSLAA, *supra* note 2 (emphasis added). See 14 C.F.R. § 460.45 (2006).

Written warnings and contractual exculpation documents<sup>34</sup> for this developing adventure activity will need a detailed and descriptive section titled “Inherent Risks” and/or “You Need to Understand These Issues” followed by a list of industry concerns or “realisms.”<sup>35</sup> As discussed above, where it is clear that one of the primary hazards or risks associated with this young industry is that there *are no* accepted standards guiding the industry regarding critical concerns like the physical condition of the SFP, what gear the SFP should be required to wear, what safety equipment should be in the vehicle, what is required in a safety briefing, what type of vehicle is capable of routinely traveling to suborbital space, or even what specific categories of aircraft or specific instrument ratings a pilot must have,<sup>36</sup> SFPs should be appraised of this dearth of standardized knowledge, awareness and response. Participants need to know – right up front – that this industry and the hybrid technologies it is creating are experimental at best. The listing of issues needs to *expressly* state or explain the fact that the industry is largely unregulated and is considered by law makers to be the province of “daredevils, visionaries and adventurers.”<sup>37</sup> The warnings need to give the

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<sup>34</sup> It is critical to understand that written warnings or information (think: common law duty to warn resulting in common law defense of assumption of risk) are distinctly different (in the legal sense) from contractual release and waiver documents in which a participant relinquishes certain legal rights in advance in exchange for the opportunity to participate in the activity. Warnings will provide common law style defenses; releases will provide contractual defenses and common law defenses. See STATE OF RISK, *supra* note 22, at chs. 6(f) (Failure to Warn), 7(a) (Defenses to Negligence Claims: Release and Waiver Documents (Including What Needs to be In These Documents and How To Properly Administer Them)), & 7(c) (Assumption of Risk).

<sup>35</sup> If truly exculpatory in nature, the document should go on to express all of the relevant legal requirements like express assumption of risk, relief from negligence, indemnity, forum selection clauses, etc. See *infra* notes 59-62.

<sup>36</sup> The FAA/AST flight crew guidelines simply recommend that pilots have a pilot's license with instrument rating and aeronautical experience, a second class airman medical certificate, and be thoroughly trained in all aspects of the flight systems. It is notable too that pilots and crew on carrier aircraft, if any, will not be considered crew for purposes of the regulations. See 14 C.F.R. § 460.5 and Human Space Flight Final Rule, *supra* note 9, at II(B)(3). See also, Jeff Foust, *The Safety Dance*, THE SPACE REV., Feb. 21, 2005, <http://www.thespacereview.com/article/326/1> (pointing out that one of the key aspects of the CSLAA is the limitation on the FAA/AST to regulate crew and passenger safety, that FAA/AST guidelines and drafts are not specifications, and quoting former Secretary Norman Mineta who said that the FAA/AST does not want “...to stifle industry...” with over-regulation).

<sup>37</sup> See *supra* note 18; see also, Montgomery, *supra* note 29.

information that the reason there is little to no regulation is because the industry is not seen by the Federal Government as anything akin to the airline or transportation industry. SFPs should be made to understand that they should not view their participation as a definite ride from point A to point B, but rather as an experience where the end result is getting to space,<sup>38</sup> however briefly or momentarily. The written information or warning should<sup>39</sup> state that the vehicles being used will not have undergone near the amount of testing that normal commercial travel style vehicles undergo before they are licensed for commercial use. To that end, the SFPs should understand that they, quite literally, are part of the testing process and they need to *see themselves* as visionaries and daredevils who are willing to pay, beyond just the \$200,000 ticket cost,<sup>40</sup> the ultimate price. Furthermore, the warnings need to *expressly* state that it has been reliably estimated there will be somewhere in the neighborhood of a 1 in 200 failure rate or higher.<sup>41</sup> The warnings must say that the entire space industry is really only 40 years old and in that time a fatality rate of just over 4 percent has emerged between the U.S. and Russian space programs with fewer than 450 people having flown to space, 18 of whom perished,<sup>42</sup> demonstrating that the estimates of failure are reliable.<sup>43</sup> The express warnings should also notify the SFP of their potential financial liabilities for a catastrophic incident

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<sup>38</sup> *Id.*

<sup>39</sup> Actually, must state, according to the Final rule; see 14 C.F.R. §460.45(b)&(c).

<sup>40</sup> See David Leonard, *Space Tourism Survey Targets Cost Factor*, Oct. 23, 2006, MSNBC, <http://www.msnbc.msn.com/id/15120091/> (quoting a basic price tag for a Virgin Galactic space liner seat at roughly \$200,000).

<sup>41</sup> See Jeff Foust, *Weighing the Risk of Human Spaceflight*, SPACE REV., July 21, 2003, at *One Former Astronaut's Perspective*, 2, <http://www.thespacereview.com/article/36/2> (with former astronaut and space shuttle pilot Rick Hauck stating that he doubts he would have flown to space if he had known of the 4% fatality rate then).

<sup>42</sup> *Id.*; see also, *supra* notes 27 & 29.

<sup>43</sup> In the later portions of the warning document where *acknowledgments* are made, the SFP should be required to acknowledge that they have been advised to prepare or update their wills and to otherwise put their affairs in order. See Montgomery, *supra* note 29 (wherein Greg Maryniak, executive director of the X-Prize Foundation is quoted as having stated/contemplated during an FAA conference that prospective passengers should receive pre-flight notices advising them to make out their wills).

under the risk sharing regime<sup>44</sup> established in CSLAA – that they (or their families or estates or businesses) could literally bear some financial responsibility for the costs of an accident under the terms of the federal legislation.<sup>45</sup> SFPs should be expressly told that, as of this moment in time, there are no insurance products in existence that will cover them – or the operators – for liabilities related to participating in these activities. SFPs should be told that the pilots for these vehicles may vary in skill level and are not certified for aeronautic type flying by the FAA.<sup>46</sup> This entire discussion, of course, also means that the more physically oriented risks associated with space flight need to be outlined; participants will need to be informed of and acknowledge things like illness at certain g-force levels, the possibilities of radiation exposure, the physical stresses of re-entry, the emotional or psychological risks associated with space travel and of extreme or adventure travel with fellow SFPs for whom the strains may be unpredictable.<sup>47</sup> It should be *plainly and expressly* conveyed that the stresses to the human body of even

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<sup>44</sup> *Id.* (stating that “...by excluding space flight participants from eligibility for indemnification by the federal government against third party claims, H.R. 3752 declines to subsidize the passenger.”); also quoting testimony from Raymond Duffy Jr., a senior vice president for Willis InSpace Underwriters during committee testimony that, “[i]f someone is willing to participate in commercial human space flights at this stage of its development then the risk should be dealt with solely between the passenger and the launch provider.” *Id.* Additionally, quoting a House report that notes: “...space flight participants wishing to ride on board a launch vehicle have chosen to undertake a risky venture of their own accord. As such, they do not merit the financial security provided by the promise of indemnification. Moreover, space flight participants are not subject to any substantive government regulation.” *Id.* See also, Hughes & Rosenberg, *supra* note 18, at 59 (stating that, “The 2004 Space Act allows individuals to undertake space flight at their own physical and financial risk. Space flight participants are excluded from indemnification eligibility under the 2004 Space Act and are not entitled to the benefits of liability insurance coverage.”).

<sup>45</sup> Does the public really understand this yet? How many of the millionaires who will likely make up the first wave of space tourism will actually be willing to bet the farm, or the kids’ financial future knowing this fact?

<sup>46</sup> See *supra* note 36.

<sup>47</sup> See *supra* note 33; *The Safety Dance*, *supra* note 36 (discussing the Medical memorandum released by the FAA/AST). See also, Harvey Wichman, *You Can’t Throw Your Socks on the Floor in a Spacecraft*, in PAULA BERINSTEIN, MAKING SPACE HAPPEN – PRIVATE SPACE VENTURES AND THE VISIONARIES BEHIND THEM, at ch. 3 (Plexus Publishing, 2002); and *id.*, *Space and the Body: Are We Robust Enough to Venture Out?*, at ch. 4

suborbital flight are, in and of themselves, fairly extreme and as yet, still not completely defined.

Readers who have done other types of adventure activities, for example rafting, will recognize that the release and waiver documents used in those adventures don't recite the kind of "industry wide" statistics being advocated in this article. The question arises, why? First, and most conclusively, there are no Federal statutory or regulatory mandates requiring provision of this information in other adventure activities. Second, with more developed adventure activities, say for example mountain climbing, sky diving or rafting, much information is already *known* about the risks. There are numerous industry standards to look to in these other activities. In rafting, for instance, it is known which boats are most useful for oar or paddle rafting and they come with very specific manufacturers use guidelines. This is also true of the gear used in skiing, mountain climbing, sky diving, etc. The agencies permitting these activities on state and Federal lands by now know from experience the volumes of participants and impacts that any given use area can sustain. Large trade associations have formed over the years and these associations promulgate safety recommendations in their respective activities and provide risk management training.<sup>48</sup> In other words, gear, equipment, standards, policies and procedures, emergency response protocols, marketing, guide qualifications, etc. have all been learned and identified and in many cases, have now even been vetted by the courts.<sup>49</sup> In contrast, where the commercial human space tourism industry is in its infancy, many of the risks of space travel are quite literally unknown. Therefore, the putative SFP needs to know that beyond

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<sup>48</sup> See, e.g., Professional Paddlesports Association, <http://www.paddlesportsindustry.org> (last visited Aug. 8, 2007); Heli-Ski US, <http://www.heli-ski.org> (last visited Aug. 8, 2007); and American Mountain Guides Association, <http://www.amga.com> (last visited Aug. 8, 2007).

<sup>49</sup> See, e.g., *Madsen v. Wyoming River Trips*, 31 F.Supp.2d 1321 (Wyoming DC 1999) (wherein the court examines proper loading of river boats); *Voight v. Colorado Mountain Club*, 819 P.2d 1088 (Colo. App. 1991) (wherein the court examines the mutual duties between participants and guides to, respectively, follow directions and instruct); *Prillaman v. Sark*, 567 S.E. 2d 76 (Ga. June 2002) (wherein the court looks to safety guidelines promulgated by a national cheerleading association to determine whether the coaches advice was given with reasonable care).

developing the early or initial hardware, the space tourism industry has really not yet developed any of the standard protocols associated with other adventure activities. This industry hasn't really even yet reached the level of a *quantifiable* "adventure." If a commercial adventure activity operator in a more developed industry like rafting or heli-skiing were going to take their clients along on commercial endeavors using unproven or experimental rafts or helicopters their attorneys would be obligated to appraise the operators of their legal and moral duty to warn their clients of these well in advance of a client paying for or committing to participate in any way. Remember, while *legal duties* are being discussed here – the legal "duty to warn" can, in many ways, be likened to a fairness principle.<sup>50</sup>

It is also worth noting that the developed case law on pre-recreational warnings is fairly uniform in saying that effective (or legally supportable) warnings are specific, obvious and direct, unambiguous, easy to understand, simple and complete.<sup>51</sup> So, the warnings developed on all of these issues related to space tourism then, have to be in clear understandable wording that any "average" person, (the "reasonably prudent person") can understand. There can be no language that obfuscates the meaning of a risk or incident – nothing like the engineering terms of art used in the statement, "the Sea Launch Zenit experienced an anomaly" today during launch operations."<sup>52</sup> Operators will have to speak clearly, simply and completely. As opposed to the Sea Launch Zenit example, operators must be prepared to say that their rocket plane or space liner blew up and disintegrated in a ball of fire when they express warnings in this new adventure industry.

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<sup>50</sup> See *supra* note 31.

<sup>51</sup> See *Duffy v. Camelback Ski Operation*, 1992 U.S. Dist. Lexis 8988(PA); *Missar v. Camelback Ski Resort*, 1984 Pa.D.&C. Lexis 326; *Passero v. Killington LTD*, 1993 U.S. Dist. LEXIS 14049 (PA).

<sup>52</sup> This was the language of the official statement issued from Sea Launch when its commercial Sea Launch Zenit 3SL rocket disintegrated in a fiery explosion on January 30, 2007. See *Space Travel, Exploration and Tourism*, [http://www.space-travel.com/Launch\\_Pad.html](http://www.space-travel.com/Launch_Pad.html) (last visited Aug. 14, 2007) (quoting a statement issued by Sea Launch).

A reasonably prudent SFP will want to know these things about the activity they are paying for and embarking on so that they can make an informed decision about participation. Where Congress has mandated not only that operators give written warnings but also that SFPs give their signed written consent to participating in the flight activities, it is clear that Congress intended that SFPs assume or take home to themselves<sup>53</sup> the risk(s) associated with commercial human space flight as it exists in its current infant status. As such, a reasonably prudent operator will *want to express* (put them in writing and in safety briefings) these issues before anyone leaves terra firma (and, according to the law, before money changes hands).<sup>54</sup>

While it's obvious why a potential SFP would want to receive this information, given the rather sobering list of risks associated with space travel as we anticipate it today, the question can be raised as to *why* the operators would want to tell all of this to their clients. In other words, it's probably obvious that if all of this is explained to the potential SFP before he or she agrees to take a flight, the newly educated participant may decline and instead decide to do something else; something less risky. Herein lies the tension between marketing and reality, between legal liabilities and being able to defend oneself in the inevitable event of a catastrophe (or, as they are called in the adventure sports industry – an "incident").<sup>55</sup> It is true that ad-

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<sup>53</sup> "Assumption of the Risk" can serve as a complete defense to a plaintiff's claims. The theory is that a participant may not sue or prevail in a suit for injuries when the person voluntarily exposes themselves to a risk or danger of which they were aware because it was either open and obvious, or because they were warned. If a guest has been adequately informed and warned, a commercial operator can make the argument that the participant assumed or "took home" the risks to themselves. See COTTON & JOHN T. WOLOHAN, *supra* note 19, at 79-83, ch. 2.21 (on Defenses Against Liability). See also, Catherine Hansen-Stamp & Charles R. (Reb) Gregg, eds., *Assumption of Risks*, III (1) THE OUTDOOR EDUCATION AND RECREATION LAW Q. (Spring 2001).

<sup>54</sup> 14 C.F.R. § 460.45 (2006).

<sup>55</sup> Beyond the fact that an "incident" in space tourism is likely to be a fiery explosion, the industry wide result will also probably be an implosion of sorts. In the adventure sport arena, when a catastrophe happens, often times insurance markets contract and coverage products disappear. When insurance is no longer available, permitting agencies withdraw licensing for adventure activities. Under the new federal regulations for Human Space Flight, liability insurance for third parties (but not for the traveling SFP) is required for operators to obtain a permit. In the current climate of the developing space tourism industry, liability style coverages or products are not yet even avail-

venture travel operators like to produce brochures, websites, video clips and general marketing that shows off their best (and often most attractive) clients traveling or recreating on sunny beautiful days with gorgeous scenery in the background and everyone having a grand time. However, this often unrealistic presentation is a type of visual, or what is known technically in the law as an “express representation” about the activity, and clients will sometimes argue they are entitled to rely on these visual representations in addition to whatever an operator does or doesn’t tell them about the activity in the warnings documents.<sup>56</sup> So, while attractive marketing can entice customers, it also is now routinely argued that these visual or, marketing representations are a type of “real” warranty that can void or compete with any other written representations or warnings.<sup>57</sup> The point is, operators have to inject some realism into the product and the marketing they are offering to the public. This also is why exculpatory and warning documents are often given or exchanged before or at the time that money changes hands. If a customer has been lured by the glossy depictions of a pictured or advertised activity, before he or she commits to encountering the risks of that activity, an operator will want to be able to demonstrate that it satisfied its legal duty to warn of what the *actual* risks of the activity are. Importantly, if an operator wants to be reasonably prudent for the sake of the company – in other words, survive – the operator will want to engage in what is called “risk shifting” in the high risk activities it offers. Risk shifting means getting the participant to accept or take home to themselves the risks associated with the activity so that the operator can offer the activity but not become liable for the risks

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able. The point is that one piece of litigation or outsized claim following an incident or catastrophe can damage the whole industry by destroying the necessary insurance markets. As such, operators should be vigilant *with one another* in ensuring that the federal regulations are followed, that industry standards are articulated and that appropriate legal defenses (WARNINGS) are in place before the industry “takes off.”

<sup>56</sup> See, e.g., *Brooks v. Timberline Tours*, 127 F. 3d 1273 (10<sup>th</sup> Cir. Oct. 30, 1997) (wherein Plaintiff argued that the visual representations presented in an advertising brochure breached the agreements in the exculpatory release contract).

<sup>57</sup> *Id.* (wherein the “integration clause” in a release and waiver contract was found to defeat plaintiffs argument that advertising brochure amounted to a breach of warranty contract claim).

associated with participation; in the law this is called "assuming the risk."<sup>58</sup> The theory is that a participant may not sue or prevail in a suit for injuries when a person voluntarily exposes themselves to a risk or danger of which they were aware because it was either open or obvious, or because the person was warned.<sup>59</sup> "Assumption of the Risk" can serve as a complete defense to a plaintiff's claims.<sup>60</sup> If a guest has been adequately informed and warned, a commercial adventure operator can make the (legally defensible) argument that the participant knowingly and voluntarily assumed (took home to themselves) the risks. It is exactly for this (reasonable and prudent) reason that the fledgling space travel adventure industry should want to fully warn SFPs of the myriad risks associated with commercial human space flight. Creating this opportunity to effectively shift the risk back to the participant wanting to experience space travel is what Congress and the FAA/AST were trying to accomplish when they codified the "informed consent" requirement for SFPs. If the space tourism operators do a complete and clear job of warning and informing participants of the wide variety of risks associated with space tourism, then when "the incident" does occur, the operators will be able to legally (and morally) argue that the SFP knew of the risks and decided to go anyway, therefore the SFP should bear the result of his or her decision.<sup>61</sup> Conversely, if these risks have not been adequately explained, it is likely that no court or jury is going to absolve this young industry from its failures to warn.<sup>62</sup>

A representative of the developing space industry recently stated that, in deciding whether to buy into the space flight phenomenon, potential SFPs will be looking to industry owners

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<sup>58</sup> 14 C.F.R. § 460.65 (2006); 49 U.S.C. § 70105(b)(5)(A-C) (Supp. 2004).

<sup>59</sup> See COTTON & JOHN T. WOLOHAN, *supra* note 19, 79-83, at ch. 2.21 (on Defenses Against Liability). See also, Catherine Hansen-Stamp & Charles R. (Reb) Gregg, eds., *Assumption of Risks*, III (1) THE OUTDOOR EDUCATION AND RECREATION LAW Q. (Spring 2001).

<sup>60</sup> *Id.*

<sup>61</sup> Again, it is necessary to point out that acknowledgement or assumption of risk, absent a release and waiver style *contract*, is simply a common law type of defense or argument.

<sup>62</sup> Note also that "assumption of the risk" is but one of the legal defenses that will be expressed in a well drafted exculpatory document. See *supra* note 35.

or personnel for “proxy votes.”<sup>63</sup> In other words, SFPs will be making decisions on whether to ride in a space vehicle or not based on whether owners or operators of the space liners themselves will use or ride in them. Plainly put – to suggest that SFPs should be looking at making their decisions as to whether to travel on one of the new space liners based on what someone else (i.e. – a financially invested operator) is doing is not a reasonably prudent suggestion and very clearly misses the point or legal realities of “informed consent” and “assumption of the risk.” This industry in particular, because of its *legal* obligations to warn and because of its undoubted need to shift the risk of the activity back to the participant should not be heard to make this analogy or encourage this line of thinking. SFPs should be informed and warned so that they can make intelligent decisions *on their own behalf* and thereby *assume the risks* of participating. If it wants to be reasonably prudent – and legally defensible – the folks *within* this industry should not suggest a mere lemming type of analysis (you follow me off this cliff...) for those considering going to space. The space operators should tell you *everything*, including the fact that, once they have warned the day lights out of you, you will likely be the only one (legally) responsible for taking on the risks of human space-flight. That’s what the operators should be telling you.<sup>64</sup> Again, as the FAA/AST Associate Administrator recently said, the regulation on commercial human space flight “...boils down to making sure any passenger intending to make a suborbital flight is fully informed ... based on the *best and most extensive* information available.”<sup>65</sup> (Emphasis added.)

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<sup>63</sup> Cathy Booth Thomas, *The Space Cowboys*, TIME, Feb. 22, 2007, available at <http://www.time.com/time/magazine/article/0,9171,1592834,00.html>.

<sup>64</sup> Additionally, these warnings should be put in the form of a Release, Waiver and Acknowledgment of Risk *contract* (exculpatory document). See *supra* notes 35 & 61. But, that’s a whole other article...

<sup>65</sup> See *supra* note 16.

# A REVIEW OF THE SPACE DEVELOPMENT PROMOTION ACT OF THE REPUBLIC OF KOREA

*Yoon Lee* \*

## I. INTRODUCTION

The Space Development Promotion Act (hereinafter the Act)<sup>1</sup> of the Republic of Korea (hereinafter Korea) was promulgated on 31 May 2005 and entered into force on 1 December 2005. The Korean government stated the purpose of the legislation as follows:<sup>2</sup>

- to establish a legal and institutional framework for promoting space development in a systematic way and using and administering space objects in an efficient way; and
- to establish, as a space-faring state, a legal ground for carrying out state obligations which are stipulated in international conventions.<sup>3</sup>

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<sup>1</sup> The Act in Korean is available at the website of the Ministry of Government Legislation, <http://www.moleg.go.kr/>. Its unofficial English version translated by the author is attached as an Annex.

<sup>2</sup> The purpose of the legislation is stated in the Proposed Space Development Promotion Act, an official document of the Korean government for submitting the bill to the National Assembly on 29 December 2004. See Proposed Space Development Promotion Act, Dec. 29, 2004, available at [http://kr.geocities.com/quantumba/171229\\_100.HWP.pdf](http://kr.geocities.com/quantumba/171229_100.HWP.pdf).

<sup>3</sup> Korea is a party to the following four of the five UN space treaties:

1) 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. 6347, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty];

In terms of its contents, as will be seen in the following chapters, the Act covers issues which have been identified as “building blocks for national space laws”<sup>4</sup> in the Report of the ‘Project 2001’ Working Group on National Space Legislation. The Report presented five building blocks: authorization of space activities, supervision of space activities, registration of space objects, indemnification regulation and other additional regulation.

In these respects, the Act can be said to be a typical national space law and the latest addition to the worldwide stock of national space laws.

This paper is aiming to provide an overview of the Act and find out how rules of space treaties are reflected in the Act. In other words it will review and analyze major provisions of the Act from the international space law perspective. Focus will be placed on issues related to “building blocks for national space laws” and the jurisdictional scope of the Act.

## II. OVERVIEW OF THE ACT

### II.1. LEGISLATIVE HISTORY

The Korean government started working for national space legislation in 2003. The Ministry of Science and Technology which is the principal government body responsible for space

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2) 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, T.I.A.S. 6599, 672 U.N.T.S. 119 [hereinafter Rescue Agreement];

3) Convention on International Liability for Damage Caused by Space Objects, March 29, 1972, 24 U.S.T. 2389, T.I.A.S. 7762, 961 U.N.T.S. 187 [hereinafter Liability Convention];

4) Convention on Registration of Objects Launched into Outer Space, Sept. 15, 1976, 28 U.S.T. 695, T.I.A.S. 8480, 1023 U.N.T.S. 15 [hereinafter Registration Convention].

<sup>4</sup> See M. Gerhard and K. Schrogel, *Report of the ‘Project 2001’ Working Group on National Space Legislation*, in ‘PROJECT 2001’ – LEGAL FRAMEWORK FOR THE COMMERCIAL USE OF OUTER SPACE: RECOMMENDATIONS AND CONCLUSIONS TO DEVELOP THE PRESENT STATE OF THE LAW, PROCEEDINGS OF AN INTERNATIONAL COLLOQUIUM, COLOGNE 556-67 (K. Böckstiegel ed., 2002).

development policies and activities initiated<sup>5</sup> the drafting of a bill on space development promotion in October 2003 and had consultations with other relevant Ministries on the draft. As a result a draft bill on space development promotion was drawn up in July 2004.

The draft bill was made public for comments of interested individuals or groups during the period of July to August 2004 and then went through other necessary procedures<sup>6</sup> inside the government. The President signed the final version of the government-initiated bill in December 2004. The bill was submitted to the National Assembly on 29 December 2004.

The government bill having reached the National Assembly was referred to the Science, Technology, Information and Telecommunications Committee of the National Assembly. The Committee held a public hearing on 28 February 2005 at which five experts in legal and scientific fields made comments on the bill. After deliberations, the Committee passed the government bill with modifications on 22 April 2005. The modified bill was sent to the Legislation and Judiciary Committee and then forwarded to the Plenary Session of the National Assembly, which finally approved it on 3 May 2005.

The President promulgated the Act on 31 May 2005. The Act came into force six months later in accordance with paragraph 1 of the Addenda of the Act.

## II.2. SUMMARY OF THE ACT<sup>7</sup>

The Act consists of 29 articles and addenda of 3 paragraphs. They cover a wide range of issues such as national space program, national space committee, registration of space objects, launch license, liability and insurance, space accident investiga-

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<sup>5</sup> There are two ways of initiating a bill in Korea: one is government-initiated legislation and the other is National Assembly members-initiated legislation. Either bill needs to pass through the National Assembly to become a law and there is no difference in its effect as a law between the two. The Act was government-initiated legislation.

<sup>6</sup> They include procedures such as review by the Government Deregulation Committee, review by the Ministry of Government Legislation and approval by the Cabinet.

<sup>7</sup> As the Act is in Korean and there is no official English translation by the Korean government, the English version used in this paper is an unofficial one translated by the author, which is attached as an Annex.

tion, support for private space projects, rescue and return of astronauts and punishment of violators. For the convenience of explanation, they are classified and summarized according to their contents as follows:

- General provisions: Articles 1-4
  - Article 1 states the purpose of the Act, which is to facilitate the peaceful use and scientific exploration of outer space and to contribute to national security and economic development.
  - Article 2 defines several terms. Space development is defined as (i) research and technology development activities related to design, production, launch, operation, etc. of space objects or (ii) use and exploration of outer space and activities to facilitate them.
  - Article 3 is about the tasks of the government.
  - Article 4 is about the relationship of the Act with other laws. The Act prevails, unless there are special provisions in other laws.
- Establishment of national space program: Article 5
  - The government is to formulate a basic program on space development promotion every five year. The Minister of Science and Technology establishes and carries out its annual implementing program.
- Relevant authorities: Articles 6, 7 and 26
  - Article 6 establishes the National Space Committee headed by the Minister of Science and Technology and commissioned to deliberate matters related to the national space program, major policies and projects of space development.
  - Article 7 allows the Minister of Science and Technology to designate and support a special agency conducting space projects.
  - Article 26 allows the Minister of Science and Technology to entrust functions such as safety judgment for launch license and collection of information on space activities to government-funded research institutes.

- Registration of a space object other than a launch vehicle: Articles 8-10

- Article 8 on domestic registration establishes a two-step registration system of a space object other than a launch vehicle: preliminary registration not later than 180 days before its launch and registration within 90 days after its entry into orbit.<sup>8</sup>

- Article 9 on international registration requires the Minister of Science and Technology to register a space object with the United Nations, except a satellite to be registered with the United Nations by the Minister of Information and Communication in accordance with the Radio Wave Act.

- Launch license for a launch vehicle: Articles 11-13

- Article 11 stipulates the obligation of acquiring a launch license to be issued by the Minister of Science and Technology.

- Articles 12 and 13 concern disqualification and revocation of a launch license.

- Liability and insurance: Articles 14 and 15

- Article 14 imposes the liability for damage from a space accident caused by a space object upon a person who launched it.<sup>9</sup>

- Article 15 provides for mandatory insurance to be secured by a person seeking a launch license. The minimum amount of its coverage is to be stipulated by a regulation of the Ministry of Science and Technology.

- Space accident investigation commission: Article 16

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<sup>8</sup> Since there is no specific term in the Act for the registration of a space object to be done within 90 days after its entry into orbit, it will be called hereafter, if needed, “after-launch registration” in contrast to “preliminary registration” which is to be done before the launch. *See Act, supra* note 1.

<sup>9</sup> As will be seen *infra* at Section III.4.2.2., it is the argument of this author that the liability referred to in Article 14 of the Act has nothing to do with the international liability for damage referred to in the Outer Space Treaty and the Liability Convention, but it is the liability for damage held domestically or locally. *See Act, supra* note 1, at art. 14.

- The Minister of Science and Technology may establish a space accident investigation commission to be composed of 5 to 11 experts.

- Space development promotion: Articles 17, 18 and 24

- Article 17 allows the Minister of Science and Technology to take measures to promote the spread and utilization of satellite information.

- Article 18 requires the Minister of Science and Technology to contrive policy measures such as manpower supply, tax incentive, financial support and priority procurement in order to encourage private sector space projects.

- Article 24 allows the Minister of Science and Technology to request data or opinions on space development and industry from other government authorities, research institutes and companies.

- Concerns on public order, national security and safety: Articles 19-21

- Article 19 authorizes the Minister of Science and Technology to order the suspension or rectification of space activities in emergencies or for public order or national security.

- Article 20 enables the Minister of Science and Technology to receive assistance and cooperation from other government authorities in respect of entry control of a launch site, communication, rescue operation, safety management, etc.

- Article 21 requires the Minister of Science and Technology to consult other government authorities in respect of space projects related to national security.

- Rescue and return: Articles 22 and 23

- Article 22 states the obligation of the government to rescue astronauts in distress in Korea or on the adjacent high seas. Article 23 is about the obligation of the government to return foreign space objects.

- Confidentiality: Article 25

- A person engaged in working in accordance with the Act has the obligation of not leaking secrets obtained during work.

• Punishment: Articles 27-29

- Violations of provisions on launch license, suspension or rectification of space activities, confidentiality, registration of a space object and space accident investigation may result in fine, imprisonment or negligence fine.

### II.3. DISCUSSIONS DURING THE LEGISLATIVE PROCESS

Since the drafting of a bill initiated by the Ministry of Science and Technology in 2003, discussions had been held at various levels and occasions until its final passage through the National Assembly in May 2005. Major discussions had happened during consultations among Ministries concerned in drafting and finalizing the government bill, during the review of the government bill by the National Assembly and during a public hearing at the National Assembly.

As no comprehensive and detailed record of all discussions is available, it is not possible to produce a full account of arguments, counter-arguments and conclusions on major issues. It is therefore tried here to provide a limited and partial picture on them by showing what issues were raised and discussed during the legislative process. The report of the Senior Counsel to the Science, Technology, Information and Telecommunications Committee of the National Assembly,<sup>10</sup> the record of discussions between government officials and lawmakers during the sessions of the same Committee,<sup>11</sup> the record of experts' opinions

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<sup>10</sup> See Report of the Senior Counsel to the Science, Technology, Information and Telecommunications Committee of the National Assembly (April 2005), available at [http://search.assembly.go.kr/bill/doc\\_30/17/pdf/171229\\_300.HWP.PDF](http://search.assembly.go.kr/bill/doc_30/17/pdf/171229_300.HWP.PDF).

<sup>11</sup> The government bill was on the agenda of the second meeting on 21 February 2005 of the Science, Technology, Information and Telecommunications Committee during the 252<sup>nd</sup> Session of the National Assembly and of its third meeting on 22 April 2005 during the 253<sup>rd</sup> Session of the National Assembly. The bill was also on the agenda of a Subcommittee on Bills of the Science, Technology, Information and Telecommunications Committee on 21 April 2005 during the 253<sup>rd</sup> Session of the National Assembly. A verbatim record of discussions in Korean can be retrieved from the website of the National

and discussions during a public hearing held by the same Committee<sup>12</sup> and the record of discussions during a seminar hosted by the Sci. & Tech. Forum, a study group of interested members of the National Assembly<sup>13</sup> are main sources for that purpose in this paper. A comparison between the Act and the two draft texts<sup>14</sup> which had appeared in the legislative process is also tried as a supplementary means of figuring out the contents of discussions, because differences among the three texts must be reflecting discussions and their outcome.

The following can be said to be major issues raised and discussed during the legislative process. They focus more on domestic policy-oriented, legal and organizational issues than on those of international legal character.

- Purpose of the Act

- There was a discussion on whether to specifically mention national security as one of the purposes of the Act. National security was added in the provision of Article 1.

- Definition of terms

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Assembly at The National Assembly of the Republic of Korea, <http://www.assembly.go.kr/index.jsp> (last visited Aug. 4, 2007).

<sup>12</sup> Five experts stated their opinions and answered questions of lawmakers at the public hearing on 28 February 2005. Two of them were law professors, another two were professors of space science and engineering, and another one was the chief of the space center at KARI, a space research institute. A verbatim record of their statements and questions and answers in Korean can be retrieved from the website of the National Assembly at The National Assembly of the Republic of Korea, <http://www.assembly.go.kr/index.jsp> (last visited Aug. 4, 2007).

<sup>13</sup> The seminar was an informal meeting to exchange opinions among working-level government officials, professors, members of space research institutes and private sector participants under the auspices of the Sci & Tech Forum. Its verbatim record in Korean can be retrieved at Sci&Tech Forum, [http://www.snt.or.kr/bbs\\_event/read.php?field=&word=&page=1&no=4](http://www.snt.or.kr/bbs_event/read.php?field=&word=&page=1&no=4) (last visited Aug. 4, 2007).

<sup>14</sup> There are two important draft texts. One is the draft bill of the Ministry of Science and Technology that was made open to the public for comments from July to August 2004 as explained *supra* at Section II.1. It used to be available at the website of the Ministry of Science and Technology, but is no longer available. The other text is the government bill that was submitted to the National Assembly on 29 December 2004. For the text of the government bill, see the Proposed Space Development Promotion Act, *supra* note 2.

- Questions were raised about the appropriateness of definitions of terms such as damage, space accident, space object, space development, space development project and satellite information. The wording of some definitions was changed accordingly.

- Concerns were expressed over the difference in the definitions of similar terms between the Act and other related laws such as the Act for the Promotion of Aerospace Industry Development and the Radio Wave Act.

- **Establishment of National Space Committee**

- The establishment of the National Space Committee was widely welcomed as a necessary step to promote space development. Opinions were expressed on the need to strengthen the status of the Committee, enhance its coordinating role among various Ministries concerned and make its operation more efficient on paper as well as in practice. The need to clarify its relationship with other existing committees in the field of science and technology in general was also pointed out.

- **Relationship with other related laws**

- Questions were raised on whether the scope of the Act was overlapping with that of the Act for the Promotion of Aerospace Industry Development. It was understood that while the Act for the Promotion of Aerospace Industry Development was focusing on aero-industry, the Act would focus on space development promotion.

- The provision of the Act, saying “This Act applies to matters relating to the promotion of space development and the use and administration of space objects unless there are special provisions in other laws,” was viewed with worry for not ensuring the supremacy of the Act in space matters.

- **Registration of a space object**

- In respect of satellites, domestic registration is to be filed with the Ministry of Science and Technology in accordance with the Act, while international registration with the United Nations is to be made by the Ministry of Information and Communication in accordance with the Radio

Wave Act. This complex system resulting from the division of authority between the two Ministries was suspected of producing inefficiency and inconvenience.

- Problems were pointed out and corrected as to the unclear deadline of registration, the lack of duty to report changes happening after the registration and the lack of a provision on the register for preliminary registration.

- A considerable change among the three texts is found as to persons or cases registration of a space object is required for. The final text, that is, the Act has a detailed and clear provision in this respect, applicable to a Korean national as well as a non-Korean national.

- A launch vehicle is excluded from the scope of space objects to be registered under the second and final texts, whereas it was not under the first draft text.<sup>15</sup>

- Launch license for a launch vehicle

- It was proposed that the Act would include a detailed list of documents required for the application for a launch license. A paragraph was added to accommodate this proposal.

- A considerable change among the three texts is found as to cases for which a launch license is required. The Act is clearer and broader in its jurisdictional scope than the draft bills.

- There were discussions on whether a project conducted by a government-funded space institute is required to have a launch license. It was understood that a license would be also applied for by a government-funded space institute.

- There was an opinion arguing that a launch license should be also made necessary for space objects other than launch vehicles.

- Liability and insurance

- The definition and scope of damage were extensively discussed. There were arguments for limiting the scope of damage and liability in order not to discourage space ac-

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<sup>15</sup> The first draft text is the draft bill prepared by the Ministry of Science and Technology in July 2004 and the second text is the government bill submitted to the National Assembly on 29 December 2004. *See supra* note 14.

tivities and investment of the private sector. Noticeable change between the first and second draft bills and the Act is the deletion of the word 'all' before the word 'damage' in Article 14.

- Concerns were expressed over Article 15(2) providing that the minimum amount of insurance coverage, not the maximum amount, is to be stipulated, because it might produce discouraging effect on the private sector engaging in space activities. There was a suggestion for doing a careful study on other countries' examples in allocating the burden of compensation for damage between the government and the private sector.

- There was an opinion arguing for introducing more detailed liability provisions to reflect relevant provisions of the Liability Convention more faithfully, such as the absolute and fault liabilities and the joint liability.

- There was an opinion arguing for introducing a provision on cross-waiver among participants in space projects.

- There was an opinion arguing for the need to prescribe the minimum amount of insurance coverage in the Act itself, not in a regulation of the Ministry of Science and Technology.

- Space accident investigation commission

- As the government bill contained four articles detailing the space accident investigation commission, it was suggested to delete three of them and retain only one for the sake of overall balance of the Act. The Act keeps only one article on the commission.

- There was an opinion arguing for including a provision on the necessity to cooperate with other states or international organizations concerned in case of a space accident.

- Utilization of satellite information

- Concerns were expressed over the possible infringement on privacy while promoting the spread and utilization of satellite information. A provision on the protection of privacy was added to address this concern.

- Suspension and rectification of space development

- Concerns were expressed as to how to compensate a person for losses when the person is ordered to suspend or rectify space activities for national security reasons which the person is not responsible for.

- Rescue and return

- There was a proposal to change the wording of the provision on rescue and return in order to reflect relevant provisions of the Rescue Agreement more accurately. This proposal was partly reflected in the Act.

- Addition of new provisions

- The Science, Technology, Information and Telecommunications Committee of the National Assembly proposed three new provisions during its review on the government bill. Thus, Article 24 on data collection and survey, Article 25 on the obligation of confidentiality and Article 26 on entrusting of authority were added.

#### II.4. FOLLOW-UP LEGISLATION

The Ministry of Science and Technology prepared follow-up regulations to implement the Act. A draft presidential decree was submitted by the Ministry of Science and Technology to the Cabinet for deliberation and finally authorized by the President in November 2005. The Presidential Decree<sup>16</sup> entered into force on 1 December 2005 together with the Act. The Presidential Decree consists of 24 articles that provide for procedural matters, issues related to the composition and operation of bodies established under the Act and other details.<sup>17</sup>

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<sup>16</sup> See Decree for Implementing the Space Development Promotion Act, Dec. 1, 2005, Presidential Decree No. 19606 [hereinafter Presidential Decree]. It was amended on 4 July 2006 to introduce provisions for establishing sub-committees under the Working-level Committee of Article 6(5) of the Act.

<sup>17</sup> The articles consist of the procedure for establishing the Basic Program on Space Development Promotion (Arts 2 and 3), the composition and operation of the National Space Committee (Arts 4-6), the designation and support of the Special Agency for Space Development (Arts 7-9), the procedure for the registration of a space object (Art 10), the procedure for acquiring a launch license (Arts 11-13), the composition, task and operation of the Space Accident Investigation Commission (Arts 14-19), the procedure for requesting other Ministries to provide cooperation such as entry control of the launch

A ministerial regulation that is another follow-up regulation to implement the Act and the above-mentioned Presidential Decree was also drafted by the Ministry of Science and Technology. The Regulation<sup>18</sup> entered into force on 1 December 2005. It has 10 articles that provide additional procedural details on the registration of a space object and the launch license for a launch vehicle, including application forms, a specimen of registration, a specimen of a launch license, a sample of register, etc. Article 9<sup>19</sup> of the Regulation stipulates the minimum amount of liability insurance coverage to be secured by an applicant for a launch license of a launch vehicle. The minimum amount is 40,000,000 SDR for a launch with a payload of less than 1 ton and 60,000,000 SDR for a launch with a payload of not less than 1 ton.<sup>20</sup>

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site and emergency assistance (Art 20), the establishment of security measures for space development project related to national security (Art 21), the procedure for data collection and survey (Art 22), the procedure for entrusting functions like safety judgment to government-funded research institutes (Art 23) and the procedure for levying negligence fine (Art 24).

<sup>18</sup> See Regulation for Implementing the Space Development Promotion Act, Dec. 1, 2005, Regulation of the Ministry of Science and Technology No. 78 [hereinafter Regulation].

<sup>19</sup> Unofficial translation by the author of Article 9 of the Regulation is as follows: Article 9 (Liability insurance)

1. The minimum amount of compensation covered by the liability insurance to be secured by a person who wants to be granted a launch license for a launch vehicle in accordance with Article 15, paragraph 2 of the Act is as follows:
  - (1) 40,000,000 unit (SDR) for a launch with a payload of less than 1 ton;
  - (2) 60,000,000 unit (SDR) for a launch with a payload of not less than 1 ton.
2. "Unit" in paragraph 1 (1) and (2) refers to the amount equivalent to a Special Drawing Right of the IMF.

Regulation, *supra* note 18, at art. 9.

<sup>20</sup> The minimum amount of insurance coverage is to be stipulated by the Regulation, taking into consideration the domestic and overseas insurance markets, under Article 15, paragraph 2 of the Act. See Regulation, *supra* note 18.

According to a legal expert having been involved in the legislation of the Act and its follow-up legislation, the respective minimum insurance amount, which was difficult to decide on, was calculated on the basis of insurance market data and other countries' examples. The expert was interviewed over the phone by the author in September 2006, but did not want to be identified.

Since new legislation on the liability for damage from a space accident is under consideration (*see infra* note 21), the fate of the present provision of the

Another follow-up legislation that will come into being in the future is an act on the liability for damage from a space accident. Article 14 of the Act provides that a person who launches a space object shall bear the liability for damage from a space accident caused by the space object and matters such as the scope and limit of liability shall be stipulated by a separate act. A draft<sup>21</sup> is now under discussion informally among officials of the Ministries concerned and the National Assembly, scholars and experts.

## II.5. RELATIONSHIP WITH OTHER LAWS RELATED TO SPACE ACTIVITIES

### *II.5.1. General Principle*

Generally speaking, a new law has precedence over a previous one and a special law has precedence over a general one under the Korean legal system like under other legal systems. This general principle applies to the relationship between the Act and other existing or future laws related to space activities. However, the principle needs to be applied in harmony with a special provision in the Act which will be explained below.

### *II.5.2. Special Provision in the Act*

Article 4 of the Act says that the Act applies to matters relating to the promotion of space development and the use and administration of space objects unless there are special provisions in other laws. It means that special provisions of other laws shall prevail over provisions of the Act in respect of matters relating the promotion of space development and the use and administration of space objects, which are the scope of application of the Act.

Concerns were raised over the appropriateness of Article 4 during the legislative process as briefly mentioned at Section

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Regulation on the minimum amount of liability insurance needs to be seen in the future discussions on the new legislation.

<sup>21</sup> A draft bill is expected to be submitted to the National Assembly in the form of a bill initiated by concerned members of the National Assembly sooner or later.

II.3. Criticism was centered on the fact that while the government intended to enact a new basic law on space development promotion, its status was placed below other laws at least in some respects. More specifically, two existing laws are possibly relevant here. One is the Act for the Promotion of Aerospace Industry Development. If a conflict arises between the Act for the Promotion of Aerospace Industry Development and the Act, the former will prevail over the latter in accordance with Article 4 of the Act. The problem is not likely to happen in practice, however, because it was understood that the Act for the Promotion of Aerospace Industry Development would continue to focus on the promotion and support of the aero-industry and the Act would focus on space development promotion and space objects.<sup>22</sup>

The other law that is relevant is the Radio Wave Act. Article 44(1) of the Radio Wave Act says that the Minister of Information and Communication shall register a satellite launched by a Korean national with the United Nations in accordance with the Registration Convention.<sup>23</sup> Article 44(1) of the Radio

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<sup>22</sup> Article 4 of the Act and this understanding are said to be the product of a compromise reached between the Ministry of Commerce, Industry and Energy and the Ministry of Science and Technology with respect to the legislation of the Act. Act, *supra* note 1, at art. 4. See Record of the Subcommittee on Bills of the Science, Technology, Information and Telecommunications Committee, 2-7, 253<sup>rd</sup> Session of the National Assembly (Apr. 21, 2005). See also, The National Assembly of the Republic of Korea, <http://www.assembly.go.kr/index.jsp> (last visited Aug. 4, 2007).

<sup>23</sup> Unofficial translation by the author of Article 44 of the Radio Wave Act is as follows:

Article 44 (Registration of satellites with the United Nations)

- (1) The Minister of Information and Communication shall register a satellite launched by a Korean national with the United Nations in accordance with the 'Convention on Registration of Objects Launched into Outer Space.'
- (2) The Minister of Information and Communication can request the person who launched a satellite to submit data necessary for its registration.
- (3) When registration is made according to paragraph (1), the Minister of Information and Communication shall inform the Minister of Science and Technology of the result of the registration without delay.

Radio Wave Act is available at the website of the Ministry of Government Legislation, <http://www.moleg.go.kr/>.

Wave Act is a special provision in the sense of Article 4 of the Act and therefore prevails over Article 9 of the Act which addresses international registration of a space object. As a result, whereas all domestic registration of satellites shall be filed with the Minister of Science and Technology, international registration of satellites shall be handled by the Minister of Information and Communication, not by the Minister of Science and Technology, in accordance with Article 44(1) of the Radio Wave Act. This logical result coming from Article 4 of the Act is expressly confirmed by the proviso<sup>24</sup> of Article 9(1) of the Act. As seen at Section II.3., this complication was pointed out as a potential source of inefficiency and inconvenience during discussions in the legislative process of the Act. In this regard Article 4 of the Act which seems to be the result of a compromise to preserve the existing laws and division of work between Ministries concerned does not go well with the aim of efficient administration of space objects.

### III. ANALYSIS OF MAJOR PROVISIONS OF THE ACT

Chapter II has shown that a considerable part of the Act is spared for domestic policy and organizational aspects to promote and support national space activities. They are provisions on national space program, national space committee, special agency for space development, utilization of satellite information, support for private space projects, inter-agency cooperation

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The current provision is the result of a revision that was made on 31 May 2005 together with the legislation of the Act. The previous text before the revision was as follows:  
Article 44 (Registration of satellites *etcetera*)

(1) The Minister of Information and Communication shall register a satellite *etcetera* launched by a Korean national with the United Nations in accordance with the "Convention on Registration of Objects Launched into Outer Space".

(2) The Minister of Information and Communication can request the person who launched a satellite *etcetera* to submit data necessary for its registration.

A key difference between the two texts is the deletion of *etcetera* from paragraphs (1) and (2) of the old text. The deletion of *etcetera* means that while registration of satellites with the UN continues to be done by the Minister of Information and Communication, registration of non-satellites is to be done by the Minister of Science and Technology.

<sup>24</sup> Act, *supra* note 1, at art. 9(1), "However, it does not apply to a satellite which is to be registered with the United Nations in accordance with Article 44, paragraph 1 of the Radio Wave Act."

for space development and others. They will not be dealt with in this paper, because they are not directly related to international space law.

Other parts of the Act with international space law implications are main issues of interest for this paper. They will be analyzed from the international space law perspective. Jurisdictional scope of the Act will be checked in respect of its compatibility with jurisdictional rules of international space law and general international law. And then provisions on authorization and supervision of space activities, registration of space objects, liability regime and others issues such as rescue of astronauts and accident investigation<sup>25</sup> will be reviewed one by one.

### III.1. JURISDICTIONAL SCOPE

Generally speaking, state jurisdiction refers to the power of a state to take action in respect of persons, things or events. It can take the form of legislative, judicial or enforcement measure.<sup>26</sup> This Section will find out the scope of jurisdiction Korea is to exercise in relation to space or space-related activities under the Act. The jurisdictional scope of the Act will then be examined from the international space law perspective.

#### *III.1.1. Jurisdictional Scope of the Act*

Since the Act does not have a general provision on its jurisdictional scope, it cannot be defined in general terms. Each relevant provision of the Act needs to be analyzed. As jurisdictional scope matters particularly in areas where government regulation and control are conspicuous, analysis will focus on such provisions. They include provisions on registration of a space object, launch license for a launch vehicle, liability for damage and accident investigation, among others.

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<sup>25</sup> These are major provisions of the Act with international space law implications. See Act, *supra* note 1.

<sup>26</sup> For jurisdiction in general, see OPPENHEIMER'S INTERNATIONAL LAW 456 (Robert Jennings and Arthur Watts, eds. 9<sup>th</sup> ed. 1996); PETER MALANCZUK, AKEHURST'S MODERN INTRODUCTION TO INTERNATIONAL LAW 109 (7<sup>th</sup> ed., 1997); MALCOM N. SHAW, INTERNATIONAL LAW 572 (5<sup>th</sup> ed., 2003).

First, provisions on registration of a space object<sup>27</sup> apply to a Korean national including a legal person who launches a space object in or outside Korea. They also apply to a non-Korean national in certain cases: when the person launches a space object in the territory of Korea or in the area or facility under the jurisdiction of Korea; and when the person launches a space object outside Korea by using a launch vehicle owned by the Korean government or a Korean national. The jurisdictional scope of provisions on registration is visualized in the following Table A.

TABLE A

Jurisdictional scope of provisions on registration of a space object

Person	Launching a space object other than a launch vehicle in Korea <sup>28</sup>	Launching a space object other than a launch vehicle outside Korea
Korean	Yes <sup>29</sup>	Yes
Non-Korean	Yes	Yes, if using a launch vehicle owned by the Korean government or a Korean.

Second, with respect to a launch license for a launch vehicle, Article 11 does not explicitly mention whether it applies only to a Korean national or also to a foreign national. According to Article 11(1), a person shall have a license when the person intends to launch a launch vehicle in the territory of Korea

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<sup>27</sup> Provisions on registration, that is, Articles 8-10, apply only to a space object other than a launch vehicle according to Article 8(1). Act, *supra* note 1.

<sup>28</sup> "In Korea" here and in subsequent Tables refers to "in the territory of Korea or in the area or facility under the jurisdiction of Korea."

<sup>29</sup> "Yes" means that the activity of the person in question is stipulated to be within the jurisdictional scope of provisions on registration of a space object. The same applies to subsequent Tables.

or in the area or facility under the jurisdiction of Korea<sup>30</sup> or when the person intends to launch outside Korea a launch vehicle owned by the Korean government or a Korean national.<sup>31</sup> Since there is nothing in Article 11 indicating that its application is limited to Korean nationals<sup>32</sup>, the Article should be deemed to be applicable to a Korean national as well as a foreign national. Table B summarizes the jurisdictional scope of Articles 11 to 13 on launch license for a launch vehicle.

TABLE B

Jurisdictional scope of provisions on launch license for a launch vehicle

Person	Launching a launch vehicle in Korea	Launching a launch vehicle outside Korea
Korean or non-Korean	Yes	Yes, if the launch vehicle is owned by the Korean government or a Korean.

Third, Article 14 on liability is applicable to a person who launched a space object in accordance with Article 8 (registration) or Article 11 (launch license), and therefore has the same scope of jurisdiction as the sum of Tables A and B. Article 15 on liability insurance is applicable to a person who intends to launch a launch vehicle, and therefore has the same scope of jurisdiction as Table B. Tables C and D show the jurisdictional scope of Articles 14 and 15 respectively.

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<sup>30</sup> As a matter of fact, the person in this case can be a Korean national or a foreign national, because not only a Korean national but also a foreign national can launch a launch vehicle in Korea, unless restricted otherwise.

<sup>31</sup> Once again, the person in this case can be also a Korean national or a foreign national, unless restricted otherwise. In most cases the person will be a Korean national, but there can be a theoretical case in which a foreign national rents and launches outside Korea a reusable launch vehicle owned by the Korean government or a Korean national.

<sup>32</sup> If Article 11 is to be interpreted to be applicable to Korean nationals only, it should have clearly stated its scope of application to that sense, as in the case of Article 19. Article 19 on suspension and rectification of space development makes it clear that it is applicable to space development carried out by a Korean national. Act, *supra* note 1.

TABLE C

## Jurisdictional scope of provision on liability

Person	Launching a space object other than a launch vehicle in Korea	Launching a launch vehicle in Korea	Launching a space object other than a launch vehicle outside Korea	Launching a launch vehicle outside Korea
Korean	Yes	Yes	Yes	Yes, if the launch vehicle is owned by the Korean government or a Korean.
Non-Korean	Yes	Yes	Yes, if using a launch vehicle owned by the Korean government or a Korean.	Yes, if the launch vehicle is owned by the Korean government or a Korean.

TABLE D

## Jurisdictional scope of provision on liability insurance

Person	Launching a launch vehicle in Korea	Launching a launch vehicle outside Korea
Korean or non-Korean	Yes	Yes, if the launch vehicle is owned by the Korean government or a Korean.

Fourth, Article 16 on Space Accident Investigation Commission and its follow-up provision of the Presidential Decree for Implementing the Space Development Promotion Act need to be examined together. Article 14 of the Presidential Decree enumerates four categories of accidents to be investigated by the Space Accident Investigation Commission: (i) an accident caused by a space object registered in accordance with Article 8 of the Act; (ii) an accident caused by a launch vehicle licensed in accordance with Article 11 of the Act; (iii) an accident caused by a foreign space object in the territory of Korea or in the area or facility under the jurisdiction of Korea; (iv) an accident caused by a foreign space object and inflicting damage to property of Korea or to life or property of a Korean national.<sup>33</sup> In addition, Article 16(3) of the Act provides for persons whom the Commission may investigate in performing its function. They are (i) a person who made preliminary registration or registration for a space object, (ii) a person who was granted a launch license for a launch vehicle and (iii) other persons involved in a space object such as its manufacturer or function-tester. The jurisdictional scope of provisions on space accident investigation can be outlined in the following Tables E and F.

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<sup>33</sup> Unofficial translation by the author of Article 14 of the Presidential Decree is as follows:

Article 14 (Object of space accident investigation) Space accidents which the Space Accident Investigation Commission has to investigate in accordance with Article 16(1) of the Act are as follows:

- (1) an accident caused by a space object for which preliminary registration or registration was made in accordance with Article 8 of the Act;
- (2) an accident caused by a launch vehicle for which a launch license was given in accordance with Article 11 of the Act;
- (3) an accident caused by a foreign space object which occurred in the territory of Korea or the area or facility under the jurisdiction of Korea;
- (4) an accident caused by a foreign space object which inflicted damage to property of Korea or to life or property of a Korean national including a legal person.

Presidential Decree, *supra* note 16, at art. 14.

TABLE E

Jurisdictional scope of provisions on space accident investigation in respect of accident

Accident	Occurring in Korea	Occurring outside Korea
Caused by a space object other than a launch vehicle registered with Korea or by a launch vehicle licensed by Korea	Yes	Yes
Caused by a foreign space object	Yes	Yes, if the accident inflicted damage to property of Korea or to life or property of a Korean.

TABLE F

Jurisdictional scope of provisions on space accident investigation in respect of person

Person	Launching a space object other than a launch vehicle in Korea	Launching a launch vehicle in Korea	Launching a space object other than a launch vehicle outside Korea	Launching a launch vehicle outside Korea	Manufacturer or function-tester
Korean	Yes	Yes	Yes	Yes, if the launch vehicle is owned by the Korean government or a	Yes

				Korean.	
Non-Korean	Yes	Yes	Yes, if using a launch vehicle owned by the Korean government or a Korean.	Yes, if the Launch vehicle is owned by the Korean government or a Korean.	Yes

Fifth, Article 19 is on suspension or rectification of space development<sup>34</sup> in cases of war or similar emergencies, or for reasons of public order or national security. The Article says that it applies to a Korean national. Table G is the jurisdictional scope of Article 19.

TABLE G

Jurisdictional scope of provision on suspension or rectification of space development in emergencies or for public order or national security

Person	Conducting space development
Korean	Yes
Non-Korean	No

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<sup>34</sup> “Space development” is defined in Article 2 of the Act as “one of the following: (i) research and technology development activities related to design, production, launch, operation, etc. of space objects; (ii) use and exploration of outer space and activities to facilitate them.” Act, *supra* note 1, at art. 2. Roughly said, it comprises space activities as well as space-related activities in a broad sense.

### III.1.2. OBSERVATION FROM INTERNATIONAL SPACE LAW PERSPECTIVE

#### *III.1.2.1. International Space Law on Jurisdiction*

The United Nations General Assembly, in its resolution 1721A(XVI) of 20 December 1961, commends to States for their guidance two principles: (a) International law applies to outer space and celestial bodies; (b) Outer space and celestial bodies are free for exploration and use by all States and are not subject to national appropriation.<sup>35</sup> These two propositions have been followed in later resolutions and treaties and are now considered as part of customary international space law. Putting together these two principles, it follows that rules of general international law on state jurisdiction are applicable in outer space including celestial bodies and therefore states can exercise extraterrestrial jurisdiction in respect of persons, things and events in outer space including celestial bodies in accordance with international law, to the extent that no state can claim national appropriation of outer space including celestial bodies. States may not exercise jurisdiction on the basis of territoriality in outer space including celestial bodies, because no state can appropriate any part of outer space including celestial bodies and have territory in outer space including celestial bodies. Jurisdiction based on other grounds such as nationality of a person or registration of a space object can be exercised in outer space including celestial bodies to the extent permissible under general international law.

The jurisdiction based on registration of a space object is stipulated expressly in the Outer Space Treaty. Article VIII of the Treaty provides that “A State Party to the Treaty on whose

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<sup>35</sup> International Cooperation in the Peaceful Uses of Outer Space, Dec. 20, 1961, G.A. Res. 1721. Operative paragraph 1 of the resolution reads as follows:

The General Assembly, (...) Commends to States for their guidance in the exploration and use of outer space in the following principles: (a) International law, including the Charter of the United Nations, applies to outer space and celestial bodies; (b) 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;

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.”<sup>36</sup> In short, the state of registry can exercise jurisdiction over its registered space object and personnel thereof, in outer space or on a celestial body. As Article VIII does not say the registration-based jurisdiction as exclusive, jurisdiction based on nationality can be also exercised to the extent applicable.

In respect of jurisdiction over persons, things or events that are or happen in the areas other than outer space and celestial bodies, there is no doubt that rules of general international law on jurisdiction are applicable. States can exercise jurisdiction in those areas to the extent permissible under general international law.

### *III.1.2.2. Review of Jurisdictional Scope of the Act from International Space Law Perspective*

Tables A to G introduced at Section III.1.1. will be reviewed from the international space law perspective on jurisdiction as explained above.

Table A is about the jurisdictional scope of provisions on registration of a space object other than a launch vehicle. There is no problem with the jurisdiction of Korea over the activity of a Korean national in or outside Korea and the activity of a non-Korean national in Korea. But Table A further indicates the jurisdiction of Korea over the activity of a non-Korean outside Korea if the activity is carried out by using a launch vehicle owned by the Korean government or a Korean. An example of such kind is a case in which launch service using a launch vehicle owned by the Korean government or a Korean national is provided to a foreign customer who launches a satellite outside Korea. The reason for Korea to try to stretch its jurisdiction to such a case seems to be that Korea may be held liable for damage caused by the payload in accordance with Article VII of the Outer Space Treaty, depending on the situation. But it may amount to excessive jurisdiction lacking a sufficient ground un-

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<sup>36</sup> Outer Space Treaty, *supra* note 3.

der international law. Furthermore, Korea is not likely to have means of enforcing the provision, when the foreign national does not comply with the obligation to register the space object launched by a launch vehicle owned by the Korean government or a Korean national. Requiring the Korean launch service provider to conclude a launch service contract under which the foreign customer agrees to register the space object with the Korean government can alleviate problems. It can provide a practical solution, but does not cure the jurisdictional problem of Article 8(2) of the Act.

Table B concerns the jurisdictional scope of provisions on a launch license for a launch vehicle. Under Table B, a non-Korean national launching a launch vehicle outside Korea is required to have a launch license to be issued by the Korean government if the launch vehicle is owned by the Korean government or a Korean national. It has the same problem of excessive jurisdiction as Table A has. On the other hand, a Korean national who is launching a launch vehicle outside Korea does not fall under the jurisdictional scope of the Act, if the Korean does not use a launch vehicle owned by the Korean government or a Korean national. The jurisdictional scope in this specific case does not seem to be sufficient, considering Articles VI and VII of the Outer Space Treaty on state responsibility and liability. Korea's jurisdiction of granting a launch license here does not seem to be broad enough to cover all possible cases in which Korea may be held responsible or liable in accordance with Article VI or VII of the Outer Space Treaty, depending on the situation.

Table C shows the jurisdictional scope of the provision on liability. As Table C has the same scope of application as the sum of Tables A and B, it has the same problems in its jurisdictional scope as Tables A and B have.

Table D displays the jurisdictional scope of the provision on compulsory liability insurance. As Table D has the same scope of application as Table B, it has the same problems in its jurisdictional scope as Table B has.

Table E relates to the jurisdictional scope of space accident investigation provisions in respect of an accident. A space accident can take place in or outside Korea.<sup>37</sup> There is no problem with the jurisdiction of Korea over an accident that occurs in Korea or in its air space. In respect of an accident which occurs in the territory of another country, in the area or facility under its jurisdiction or in its air space, the exercise of jurisdiction by Korea will be difficult in practice due to territorial jurisdiction of the another country, even though the space object involved in the accident is registered with Korea and the persons involved in the accident are Korean nationals. In respect of an accident that occurs in the area outside of the jurisdiction of any country, in air space thereof or in outer space, Korea can exercise registration-based jurisdiction if the space object is registered with Korea. If not, Korea will have difficulties in exercising jurisdiction, since the state of registry will have registration-based jurisdiction. In addition, Korea may have chances of exercising jurisdiction over the accident on the basis of nationality of the persons involved in the accident. From these points of view, the jurisdictional scope of Table E is too broad and will not be not always supported by solid grounds for jurisdiction. In particular, jurisdiction over an accident caused by a foreign space object and inflicting damage to property of Korea or to life or property of a Korean national<sup>38</sup> is deemed to be an excessive one. It sounds like jurisdiction on the basis of the passive personality principle which is considered to be a dubious ground under international law.<sup>39</sup>

Table F relates to the jurisdictional scope of space accident investigation provisions in respective of a person. No problem arises from the jurisdiction of investigation over a person who

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<sup>37</sup> "In Korea" means "in the territory of Korea or in the area or facility under the jurisdiction of Korea."

<sup>38</sup> According to Article 14 of the Presidential Decree for Implementing the Space Development Promotion Act, the Space Accident Investigation Commission *has to* investigate the four categories of accidents enumerated in the Article including the one in question now. For the full text of the Article, *see supra* note 33.

<sup>39</sup> Concerning the passive personality principle in general, *see* SHAW, *INTERNATIONAL LAW*, *supra* note 26, at 589-591.

registers a space object with Korea or is granted a launch license for a launch vehicle by Korea, to the extent that jurisdiction for registration or licensing is based on legitimate grounds. Thus, Table F, being dependent on Tables A and B, has the same problems in the scope of jurisdiction as Tables A and B have. With respect to a manufacturer or a function-tester, another category of person to be subject to investigation, difficulties may be found for exercising jurisdiction over a manufacturer or a function-tester who is neither a Korean national nor in Korea.

Table G is about the provision on suspension or rectification of space development in emergencies or for public order or national security. The provision is applicable only to Korean nationals who are conducting space development. It has narrow scope of jurisdiction, compared with other provisions reviewed in the above. If suspension or rectification of space activity in question is necessary for military purposes in emergencies or for purposes of national security or public order, there is no reason Korea should not exercise jurisdiction of imposing suspension or rectification of the activity on non-Korean nationals on the basis of territoriality or registration of the space object involved. Jurisdictional scope of Article 19 in this regard is not sufficient in that Article 19 is applicable to Korean nationals only.

### *III.1.3. Conclusion*

The analyses of relevant provisions of the Act have shown that their jurisdictional scope is generally within the range permissible under international space law rules on jurisdiction. There are a few provisions, however, which can be considered to have excessive scope of jurisdiction. On the other hand, there are other provisions whose jurisdictional scope is not broad enough to ensure their purpose.

Potential problems of excessive jurisdictional scope are found in the following cases:

- Where a non-Korean national who launches a space object other than a launch vehicle outside Korea by using a launch vehicle owned by the Korean government or a Korean national shall make preliminary registration and af-

ter-launch registration of the space object with the Korean government in accordance with Articles 8(2)②<sup>40</sup> and 8(5);

- Where a non-Korean national who launches outside Korea a launch vehicle owned by the Korean government or a Korean national shall have a license issued by the Korean government in accordance with Article 11(1)②<sup>41</sup>;
- Where the Space Accident Investigation Commission has to investigate an accident which occurs outside Korea and is caused by a foreign space object if the accident inflicts damage to property of Korea or to life or property of a Korean national in accordance with Article 14 of the Presidential Decree for Implementing the Space Development Promotion Act.

Jurisdictional scope is considered to be not broad enough in the following cases:

- Where a Korean national who launches a launch vehicle outside Korea shall have a launch license of the Korean government if the launch vehicle is owned by the Korean government or a Korean national under Article 11;
- Where suspension or rectification of space development in emergencies or for reasons of public order or national security is to be directed only toward Korean nationals under Article 19.

These problems in jurisdictional scope can be mitigated by various means such as special arrangement on registration of a space object between a launch service provider and its customer, agreement on registration of a space object between countries concerned, self-restraint in exercising jurisdiction or ad hoc exercise of jurisdiction in special circumstances. But problems in

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<sup>40</sup> Since provisions of the Act on liability and space accident investigation are also applicable to such a non-Korean national, those provisions have the same potential problem of excessive jurisdictional scope in respect of such a non-Korean national. *See Act, supra* note 1.

<sup>41</sup> Since provisions of the Act on liability, liability insurance and space accident investigation are also applicable to such a non-Korean national, those provisions have the same potential problem of excessive jurisdictional scope in respect of such a non-Korean national. *See Act, supra* note 1.

the provisions of the Act continue to exist, even though they could be avoided in practice.

### III.2. AUTHORIZATION AND SUPERVISION

#### *III.2.1. Authorization and Supervision System of the Act*

There are several provisions in the Act that concern authorization and supervision of space or space-related activities. They are Article 11 (launch license for a launch vehicle), Article 12 (disqualification), Article 13 (revocation of a launch license and hearing), Article 19 (suspension and rectification), Article 26 (entrusting of authority) and Article 27 (penal regulations).

A person is required to have a launch license to be issued by the Minister of Science and Technology when the person intends to launch a launch vehicle in the territory of Korea or in the area or facility under the jurisdiction of Korea or when the person intends to launch outside Korea a launch vehicle owned by the Korean government or a Korean national.<sup>42</sup> An application for a license needs to be accompanied by a launch plan that contains a safety analysis report, a payload operation plan and a plan on discharging the liability for damage. The Minister shall, in granting a license, take into consideration the appropriateness of the purpose of using the launch vehicle, the appropriateness of safety management of the launch vehicle, financial ability in case of a space accident and other technical matters related to launch and launch preparations. The Minister may entrust safety judgment on the launch to certain government-funded institutes. A person who launches a launch vehicle without a license shall be subject to imprisonment for a period not exceeding 5 years or to a fine not exceeding 50 million won.<sup>43</sup>

There are provisions on supervision to be done after a launch license is granted. A change in what has been licensed needs another license except a minor change. A launch license may be revoked for various reasons: delay of launch for not less

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<sup>42</sup> As of November 2006, there has yet to be an application for a launch license.

<sup>43</sup> It is worth around US\$ 50,000, supposing that the exchange rate of the Korean won versus the US dollar is roughly 1000:1.

than one year, acquisition of a license through deceptive means, request from other Ministry due to national security reasons, safety problems of the launch vehicle or unauthorized change of what had been licensed. More generally, space development<sup>44</sup> of a Korean national may be subject to suspension or rectification in emergencies such as war or disturbances or for reasons of public order or national security.

### III.2.2. OBSERVATION FROM INTERNATIONAL SPACE LAW PERSPECTIVE

#### *III.2.2.1. International Space Law on Authorization and Supervision*

Article VI of the Outer Space Treaty provides that states shall bear international responsibility for national activities in outer space and for assuring that national activities are carried out in conformity with the provisions of the Treaty. Article VI further says that activities of non-governmental entities in outer space shall require authorization and continuing supervision by the appropriate state.<sup>45</sup> In response, states regulate national activities in order to ensure their conformity with the provisions of the Treaty and the appropriate state needs to authorize and continuously supervise national activities.

Since the Outer Space Treaty does not provide definitions for ‘national activities’ and ‘the appropriate state’, it is not automatically clear which activities constitute national activities and which state is the appropriate state to authorize and

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<sup>44</sup> The term “space development” is very broadly defined in Article 2 of the Act, thus including space or space-related activities in a strict as well as broad sense. See Act, *supra* note 1, at art. 2.

<sup>45</sup> The text of Article VI of the Outer Space Treaty reads as follows:

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.

Outer Space Treaty, *supra* note 3, at art. VI.

supervise the activity. Those questions need interpretation of relevant provisions.

There is no internationally agreed interpretation of the term 'national activities'. Von der Dunk argues: "The most effective interpretation of private 'national activities' would make states internationally responsible precisely for those activities over which they can exercise legal control."<sup>46</sup> Therefore he interprets 'national activities of a state' as "activities falling within the jurisdiction of that state" and states that "national space legislation should be made applicable to all activities undertaken either from the territory of, and/or by nationals of, and/or with space objects registered by the state concerned."<sup>47</sup> This jurisdiction-based interpretation of national activities is said to enjoy wide support in literature, although not undisputed.<sup>48</sup>

There are diverse opinions on the term 'the appropriate state and as to whether there should be one or several appropriate states. Those questions, however, do not seem to have practical importance. Even though a state is not the appropriate state in respect of an activity, the former state is not exempt from international responsibility for the activity under the first sentence of Article VI of the Outer Space Treaty, if the activity in question is its national activity. Under the circumstances that the Outer Space Treaty does not specify the appropriate state and there is no internationally accepted view on it, each state will try to regulate national activities and is entitled to regulate activities under its jurisdiction. The question on which state's jurisdiction will prevail depends on the priority of each jurisdiction or agreement between the states involved.<sup>49</sup>

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<sup>46</sup> See F. VON DER DUNK, PRIVATE ENTERPRISE AND PUBLIC INTEREST IN THE EUROPEAN "SPACESCAPE": TOWARDS HARMONIZED NATIONAL SPACE LEGISLATION FOR PRIVATE SPACE ACTIVITIES IN EUROPE 19 (International Institute of Air and Space Law, Faculty of Law, Leiden University, 1998).

<sup>47</sup> *Id.* at 50-51.

<sup>48</sup> See S. Reif, B. Schmidt-Tedd and K. Wannemacher, *Report of the 'Project 2001' Working Group on Privatisation*, in 'PROJECT 2001' – LEGAL FRAMEWORK FOR THE COMMERCIAL USE OF OUTER SPACE: RECOMMENDATIONS AND CONCLUSIONS TO DEVELOP THE PRESENT STATE OF THE LAW, PROCEEDINGS OF AN INTERNATIONAL COLLOQUIUM, COLOGNE 416 (K. Böckstiegel ed., 2002).

<sup>49</sup> Von der Dunk observes, "(...) the 'obligation' for the appropriate state to actually exercise its jurisdiction seems to be devoid of practical importance. The function of this

Article VI of the Outer Space Treaty does not specify any particular contents, timing, form or mode of authorization, and other provisions of the Treaty and other space treaties do not either. Hence, states have a wide range of discretion in granting authorization to national activities. But as the first sentence of Article VI of the Outer Space Treaty provides that states are responsible for ensuring that national activities are carried out in conformity with the provisions of the Outer Space treaty, states are obliged to have national activities be in conformity with various provisions of the Outer Space Treaty in authorizing and supervising national activities.

Article VI of the Outer Space Treaty does not say much about supervision, except for requiring supervision to be continuing. States have also discretion in interpreting and conducting continuing supervision of national activities.

#### *III.2.2.2. Review of Authorization and Supervision System of the Act from International Space Law Perspective*

The licensing system for a launch vehicle provided for in the Article 11 of the Act is a typical way of authorizing national activities. The competent authority issuing a license, requirements for being issued a launch license, disqualified persons and punishment for violators are clearly stated in relevant provisions. Considering the discretion accorded to states due to non-existence of specific details on authorization in the Outer Space Treaty, there is no problem in the licensing system of the Act in respect of a launch vehicle.

As seen at the previous section, national activities requiring authorization are not limited to launching of a launch vehicle. National activities are considered to comprise activities falling within the jurisdiction of the state, which includes all activities undertaken either from the territory of, and/or by nationals of, and/or with space objects registered by the state concerned. The

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clause should probably be read more as presenting an exhortation. Relevant states should arrange for at least one of them to exercise jurisdiction by providing for (national) regulation in order to make the private activity in question subject to legal restraints." See VON DER DUNK, *supra* note 46, at 21.

licensing system of the Act does not cover the whole range of national activities of this interpretation, but deals with launch vehicles only. The Act leaves the launch and operation of a space object other than a launch vehicle outside of the licensing system. A space object other than a launch vehicle does not need a license, but needs preliminary registration and after-launch registration with the Ministry of Science and Technology. Registration may amount to a kind of control, but falls short of authorization. A person who makes preliminary registration and after-launch registration is required to report a launch plan and relevant information to the Minister of Science and Technology in accordance with Article 8 of the Act, but the Minister has no power to approve, change or prohibit the activities related to the launch or operation of the space object concerned.<sup>50</sup> Furthermore, items that need to be reported for registration of a space object do not include safety aspect of its launch and operation that is one of the key elements of the authorization system.

Regarding the continuing supervision of national activities, the Act introduces various systems such as requiring a new license for a change of licensed items, revocation of a license and suspension and rectification of activities. However, the problem is again that the supervision system does not cover the entire scope of national activities.

### III.2.3. CONCLUSION

The Act has a system of authorization and supervision for a launch vehicle, but lacks it in respect of a space object other than a launch vehicle. In other words, the launch and operation of a satellite that are considered as Korean national activities in the meaning of Article VI of the Outer Space Treaty can go ahead without authorization and supervision of the Korean government. This situation does not match the provisions of Article VI of the Outer Space Treaty. Nor is it in the interests of the

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<sup>50</sup> Under Article 8(4) of the Act, the Minister of Science and Technology may demand rectification or supplementation of the launch plan of the space object, but only in limited cases where the ability to discharge the liability for damage is considered not sufficient. See Act, *supra* note 1, at art. 8(4).

Korean government, because the Korean government shall be responsible for national activities over which it has no legal means of control under the Act. The authorization and supervision system needs to be expanded to cover activities related to a space object other than a launch vehicle.

### III.3. REGISTRATION

#### *III.3.1. Registration System of the Act*

Provisions of the Act related to registration of space objects are Article 8 (domestic registration of a space object), Article 9 (international registration of a space object), Article 10 (administration of registry) and Article 29 (negligence fine).

The registration system of the Act is unique in that Article 8 adopts a two-step approach, which consists of preliminary registration and after-launch registration. Preliminary registration shall be filed with the Minister of Science and Technology by a person who intends to launch a space object other than a launch vehicle, not later than 180 days before the anticipated date of launch. The person who has filed preliminary registration shall register the space object with the Minister of Science and Technology within 90 days after its entry into satellite orbit.<sup>51</sup>

Space objects that need to be registered under the Act are limited to objects other than launch vehicles.<sup>52</sup> Article 8(1) of the Act excludes launch vehicles from space objects to be registered.<sup>53</sup> As a result, satellites do not need to be licensed but reg-

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<sup>51</sup> Since the entry into force of the Act, there have been three cases of preliminary registration and two cases of after-launch registration as of November 2006. All of them are for satellites. Three cases of preliminary registration are for KOMPSAT-2, KOREASAT-5 and Hannuri-1. KOMPSAT-2 is a multi-purpose remote-sensing satellite launched on July 28, 2006. KOREASAT-5 is a communications and broadcasting satellite launched on August 22, 2006. Hannuri-1 was a small scientific experimental satellite made by a university team, but its launch failed, making its after-launch registration unnecessary. KOMPSAT-2 and KOREASAT-5 were registered with the Ministry of Science and Technology after their successful launch.

<sup>52</sup> In fact, space objects other than launch vehicles will be satellites for the time being, considering the present level of Korea's space activities and technology.

<sup>53</sup> As explained in Section II.3., the first draft text of July 2004 by the Ministry of Science and Technology did not exclude launch vehicles from space objects to be registered, but the government bill submitted to the National Assembly in December 2004 did exclude. Many parts of the first draft had been changed during the process of consul-

istered, while launch vehicles need to be licensed but are not to be registered.

Cases requiring preliminary registration and after-launch registration are when a Korean national intends to launch a space object in or outside Korea, when a non-Korean national does in Korea or in the area or facility under Korea's jurisdiction and when a non-Korean national does outside Korea by using a launch vehicle owned by the Korean government or a Korean national.

Article 8(3) enumerates items to be included in a launch plan to be submitted when filing preliminary registration: the purpose of the space object to be registered, its owner, life expectancy, place and anticipated date of launch, basic trajectory, provider and specifications of the launch vehicle to be used, matters related to the discharge of liability in case of a space accident, manufacturer and manufacturing date and number of the space object, etc. If the Minister of Science and Technology, after reviewing the launch plan, finds the ability to discharge the liability for damage in case of a space accident to be insufficient, the Minister may demand rectification or supplementation under Article 8(4). Article 8(5) provides that a change happening after preliminary registration and after-launch registration shall be reported to the Minister of Science and Technology within 15 days after the knowledge of the change.

An exception in registration is provided in the proviso of Article 8(5), which says that the registration obligation does not apply to a space object registered with a foreign state upon agreement with the government of the launching state in accordance with the Registration Convention.

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tations inside the government, and the exclusion of launch vehicles was one of the changes that happened. Contents of intra-governmental consultations and discussions were not made public and the reason for the exclusion of launch vehicles is unknown.

This author suspects that registration requirement for a launch vehicle was stricken out due to the consideration of reducing government control and regulation on the private sector. Registration would have been perceived as a kind of control, though less strong than license. Thus, requirements of both registration and license for a launch vehicle would have been viewed as unnecessary double burden for the private sector. So the Act ultimately came to adopt a system in which launch vehicles are subjected to stronger control of license and satellites are subjected to less strong control of registration, neither being subjected to double burden of both kinds of control.

Violation of the obligations of preliminary registration, after-launch registration or report of changes will result in a negligence fine<sup>54</sup> in accordance with Article 29(1) and (2).

Article 10 requires the Minister of Science and Technology to maintain registries for preliminary registration and after-launch registration. Article 9 is about international registration of a space object that has been registered domestically. Paragraph 1 of Article 9 requires the Minister of Science and Technology to register space objects with the United Nations via the Minister of Foreign Affairs and Trade, except satellites to be registered with the United Nations by the Minister of Information and Communication in accordance with Article 44(1) of the Radio Wave Act.<sup>55</sup>

### III.3.2. OBSERVATION FROM INTERNATIONAL SPACE LAW PERSPECTIVE

#### *III.3.2.1. International Space Law on Registration*

The registration of space objects is important for the orderly administration of space activities. The Outer Space Treaty mentions the registration of space objects indirectly in Article VIII, by providing that the state of registry shall retain jurisdiction and control over the object and any personnel thereof while in

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<sup>54</sup> The maximum amount of the fine is 10 million won (approximately US\$ 10,000) in case of non-registration and 5 million won (approximately US\$ 5,000) in case of non-report of changes.

<sup>55</sup> As a result of the provisions of Article 9(1) of the Act and Article 44(1) of the Radio Wave Act, two types of space objects are left for the Minister of Science and Technology to register with UN. First, space objects which are neither launch vehicles nor satellites are those. However, considering the present level of Korea's space capabilities, there will be very few space objects of such kind at least in the near future. See Act, *supra* note 1, at art. 9(1); and Radio Wave Act, *supra* note 23.

Second, satellites which are launched by non-Korean nationals and domestically registered with the Minister of Science and Technology in accordance with Article 8(2) of the Act are also left for the Minister to register with UN. This is because Article 44(1) of the Radio Wave Act says that the Minister of Information and Communication shall register a satellite launched by a Korean national with the United Nations in accordance with the Registration Convention. Radio Wave Act, *supra* note 23. Thus, Article 44(1) of the Radio Wave Act covers satellites launched by Koreans only, excluding satellites launched by non-Koreans in Korea. For the text of Article 44 of the Radio Wave Act, see *supra* note 23.

outer space. A separate document, the Registration Convention was produced for providing details on registration.

Article II of the Registration Convention requires a launching state to register a space object launched into earth orbit or beyond by entering the object in its registry. The term 'space object' is meant to include "component parts of a space object as well as its launch vehicle and parts thereof" under Article I(b). The launching state is required to maintain a registry and inform the United Nations of the establishment of the registry. Where there are two or more launching states, they shall jointly determine which state to register the object. The contents of the registry are to be determined by the state of registry.<sup>56</sup>

Article IV of the Registration Convention provides that the state of registry shall furnish to the United Nations, as soon as practicable, information concerning each space object carried on its registry. It includes the name of launching state or states, designator or registration number of the space object, date and location of launch, basic orbital parameters and general function of the space object. The state of registry is required to notify the United Nations of space objects which have been registered but are no longer in earth orbit, to the greatest extent feasible and as soon as possible.

### *III.3.2.2. Review of Registration System of the Act from International Space Law Perspective*

The first question could be asked about whether the registration system of the Act has the proper scope of application in respect of what kinds of space objects to be registered. The obligation of domestic registration applies only to a space object other than a launch vehicle under Article 8(1) and (5) of the Act. A launch vehicle is not the object of registration. Therefore, the Korean government is not likely to register with the United Nations a launch vehicle which is not domestically registered with it, because according to Article 9 of the Act the Minister of Sci-

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<sup>56</sup> Article I(c) of the Registration Convention provides that "The term 'State of registry' means a launching State on whose registry a space object is carried in accordance with article II." Registration Convention, *supra* note 3, at art. I(c).

ence and Technology is to register a space object with the United Nations when the space object is registered with the Minister in accordance with Article 8(5) of the Act.<sup>57</sup> As a result, a launch vehicle will neither be registered with the Korean government, nor with the United Nations, even though the launch vehicle is launched or licensed by the Korean government and Korea is its launching state. By contrast, Article II(1) of the Registration Convention requires a launching state to register a space object launched into earth orbit or beyond, which is meant to include component parts of a space object as well as its launch vehicle and parts thereof under Article I(b). In this regard, the registration system of the Act which totally excludes a launch vehicle from registration is not in agreement with the Registration Convention. Major space-faring countries are observed to register at least some of their launch vehicles, even though their respective practices of registration are not identical and consistent in all cases.<sup>58</sup>

The second point is related to the concept of launching state. It is the launching state that shall register a space object launched into Earth orbit or beyond under Article II(1) of the Registration Convention. The term “launching state” is defined in Article I(a) of the Registration Convention as a state which launches or procures the launching of a space object or a state from whose territory or facility a space object is launched. Strictly speaking, only launching states can and shall register space objects. In comparison, Article 8 of the Act requires registration in case (i) a Korean national launches a space object in or outside Korea, (ii) a non-Korean national launches a space

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<sup>57</sup> It may be possible for the Korean government to register launch vehicles with the United Nations regardless of the provisions of Article 9 of the Act, because it can have discretion to do so and has sufficient information on the launch vehicles licensed by it. But such a move, if it happens, would not be a matter of law, but a matter of fact.

<sup>58</sup> There are many entries of launch vehicles or their parts in the “United Nations Register of Space Objects Launched into Outer Space” which is the register maintained by the United Nations receiving notifications on registration of space objects from UN member countries in accordance with the Registration Convention. See United Nations Office for Outer Space Affairs, *U.N. Register of Space Objects Launched into Outer Space*, [www.unoosa.org/oosa/en/SORegister/docsstatidx.html](http://www.unoosa.org/oosa/en/SORegister/docsstatidx.html) (last visited Aug. 6, 2007). On the practice of registration of space objects by European Space Agency member states, see Yoon Lee, *Registration of space objects: ESA member states' practice*, 22(1) SPACE POL'Y 42 (2006).

object in the territory of Korea or in the area or facility under the jurisdiction of Korea, and (iii) a non-Korean national launches a space object outside Korea by using a launch vehicle owned by the Korean government or a Korean national. When comparing the definition of launching state of the Registration Convention and the cases requiring registration under the Act, it is clear that the two are not identical. This means that there can be cases in which registration is required by the Act even when Korea is not a launching state. In reverse, there can be cases in which registration is not required by the Act when Korea is a launching state. The provision on registration of the Act is not in total agreement with the Registration Convention in this regard. But the potential problem is diluted by the proviso of Article 8(5) of the Act, because the obligation of registration is not applicable to a “space object registered with a foreign state on agreement with the government of the launching state in accordance with the Registration Convention.”<sup>59</sup>

Other features of the registration system of the Act such as the two-step approach of preliminary registration and after-launch registration, provisions on the timing of registration and documents to be submitted for registration seem to be mostly domestic aspects of registration which are under the discretion of the state concerned.

### *III.3.3. Conclusion*

The Act has three articles fully devoted to registration and one article on negligence fine. They provide substantive and procedural details related to registration. Considerable weight is given to registration by the Act. Registration seems to be considered not just as a procedural necessity, but also as a means of control and supervision over a space object other than a launch vehicle by legislators of the Act.

As seen in the preceding sections, a space object other than a launch vehicle is not subject to authorization of the Korean

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<sup>59</sup> It is not perfectly clear from the wording of the provision whether “a foreign state” and “the launching state” is one and the same state or not. But the two would be identical in most cases. Act, *supra* note 1, at art. 8(5).

government, while a launch vehicle stays outside of the registration system. The two-step approach of preliminary registration and after-launch registration can be viewed as a prudent system which is useful for the government to exercise a kind of control and supervision over activities during the stage between preliminary registration and launch. In fact, Article 8(4) says that the Minister of Science and Technology, after reviewing the launch plan submitted for preliminary registration, may demand rectification or supplementation if the Minister considers the financial ability for liability to be insufficient.

The exclusion of a launch vehicle from the registration system is a problem which needs to be addressed.

### III.4. LIABILITY

#### III.4.1. LIABILITY SYSTEM OF THE ACT

Article 14 of the Act concerns liability. It provides that “A person who has launched a space object<sup>60</sup> in accordance with Article 8 or 11 shall bear the liability for damage from a space accident caused by the space object. Matters such as the scope and limit of liability shall be stipulated by a separate Act.” There is no definition or explanation on damage and its scope in the Act. A space accident is defined as “an occurrence of damage to life, body or property due to crash, collision or explosion of a space object or other situation” in Article 2(d). There is no further elaboration on how this liability system relates to relevant rules of space treaties which hold a launching state internationally liable for damage caused by its space object. What is clear from Article 14 of the Act is that a person launching a space object is liable for damage caused by the space object.

Article 15 which is applicable only to a launch vehicle introduces mandatory liability insurance to be secured by an applicant for a launch vehicle license against the possibility of a space accident. The minimum amount of compensation to be covered by the insurance is to be stipulated by a Regulation of

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<sup>60</sup> A space object here includes a launch vehicle. Act, *supra* note 1, at art. 14.

the Ministry of Science and Technology, taking into account domestic and overseas insurance markets.

A financial ability to pay compensation for damage from a space accident is an item to be submitted to the government by a person who files preliminary registration for a space object other than a launch vehicle under article 8(3). The Minister of Science and Technology can demand rectification or supplementation by the person if the Minister considers his or her financial ability insufficient.

### III.4.2. OBSERVATION FROM INTERNATIONAL SPACE LAW PERSPECTIVE

#### *III.4.2.1. International Space Law on Liability*

Article VII of the Outer Space Treaty and provisions of the Liability Convention are main sources of rules of international space law on liability for damage caused by a space object. Under Article VII of the Outer Space Treaty, a launching state of a space object is internationally liable for damage to another state or to its natural or juridical persons by the space object. A launching state is defined as a state that launches or procures the launching of a space object or a state from whose territory or facility a space object is launched.<sup>61</sup> If a state comes under one of the four categories of the definition of a launching state, it becomes a launching state and is held liable for damage caused by the space object in question. Since there is no universally accepted interpretation on the four categories, however, it is not always clear which state is liable as a launching state.

Article I of the Liability Convention defines damage as “loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical, or property of international intergovernmental organizations.” Mental and psychological injuries are considered to be included in “other impairment of health”, but it is generally

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<sup>61</sup> See Outer Space Treaty, *supra* note 3, at art. VII, and Liability Convention, *supra* note 3, at art. I(c).

doubtful whether indirect damage such as loss of income could be claimed under the Liability Convention.<sup>62</sup>

Article VII of the Liability Convention makes clear that the provisions of the Convention are not applicable between a launching state and its nationals or foreign nationals participating in the operation of the space object.

Under the Liability Convention, only states<sup>63</sup> can present a claim for compensation for damage to a launching state. Individuals are not allowed to pursue a claim directly, but through states. A claim for compensation for damage shall be directed through diplomatic channels.

Article XI of the Liability Convention is about its relationship with the local remedy rule. It does not require the prior exhaustion of any local remedies for the presentation of a claim for compensation for damage to a launching state. It also says that nothing in the Convention shall prevent a state, or natural or juridical person from pursuing a claim in the courts or administrative tribunals or agencies of a launching state. Thus, there are two ways a claim can be pursued. One is a claim presented internationally by a state to a launching state in accordance with the Liability Convention, and the other is a claim pursued locally in the courts or other media of a launching state. But a state is not entitled to present a claim under the Liability Convention in respect of the same damage for which a claim is being pursued locally in a launching state.

#### *III.4.2.2. Review of Liability System of the Act from International Space Law Perspective*

Whereas Article VII of the Outer Space Treaty and provisions of the Liability Convention provide that a launching state

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<sup>62</sup> See F. von der Dunk, *Public Space Law and Private Enterprise: The Fitness of International Space Law Instruments for Private Space Activities*, in PROCEEDINGS OF THE PROJECT 2001 – WORKSHOP ON LEGAL ISSUES OF PRIVATIZING SPACE ACTIVITIES 27-28 (1999).

<sup>63</sup> They are: (i) a state which suffers damage, or whose natural or juridical persons suffer damage; (ii) a state in whose territory a natural or juridical person sustained damage, if the state of nationality has not presented a claim; and (iii) a state whose permanent residents sustained damage, if neither of the first two states has presented a claim. See Liability Convention, *supra* note 3, at art. VIII.

is internationally liable for damage caused by its space object to another state or to its natural or juridical persons, Article 14 of the Act says that a person having launched a space object shall bear the liability for damage from a space accident caused by the space object. The liability system of the Act seems to deviate from that of international space law in this regard. The question here is whether and how Article 14 of the Act can be interpreted as being compatible with the liability rules of international space law. Even though the Act does not provide any clue to this question, a basic guideline would be that the Act should be interpreted, to the extent possible, as not being in violation of liability rules of international space law under which a state, not an individual, is internationally liable for damage caused by its space object.<sup>64</sup> From this point of view, the following observations can be made on the liability system of the Act:

First, whatever Article 14 of the Act says, there is no change at all with the principle that Korea is internationally liable for damage to another state or to its natural or juridical persons caused by a space object for which Korea is a launching state in the sense of Article VII of the Outer Space Treaty and Article I(c) of the Liability Convention. As a state party to the Outer Space Treaty and the Liability Convention, Korea is internationally bound to their provisions regardless of its domestic law.

Second, accordingly, Article 14 of the Act which says a clearly different language from liability provisions of the Outer Space Treaty and the Liability Convention should be considered to have nothing to do with the liability internationally held for damage caused by a space object. International liability is one to be pressed on and borne by a state, not by an individual.

Third, if the above is correct, Article 14 of the Act is deemed to be a provision on the liability held domestically or locally for damage caused by a space object.

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<sup>64</sup> Article 6(1) of the Constitution of Korea, unofficially translated by the author, provides that "Treaties concluded and promulgated in accordance with the Constitution and generally accepted rules of international law shall have the same effect as domestic laws of the Republic of Korea." KOREA CONST. art 6(1). As a matter of principle under general international law, Korea cannot evade its international obligation for reasons of its domestic law in case of a conflict between domestic law and international law.

Fourth, there are two cases in which Article 14 of the Act is of use. One is when a local remedy is pursued in the courts or other forum of Korea by a foreign government or individual. The other is when a Korean national brings a lawsuit against the Korean government or another Korean national. Article VII of the Outer Space Treaty and provisions of the Liability Convention do not apply to these two cases for which Article 14 of the Act is applicable.

Fifth, if the intention of drafters and legislators of Article 14 of the Act was to indemnify the Korean government against the liability caused by private space activities, the Article does not serve the purpose at all. There is no provision on indemnification for the government in the Act.

#### III.4.3. CONCLUSION

It has been shown that the liability provision of the Act is not an appropriate one in implementing the liability regime of international space law. It is also a problem that the Act does not have indemnification or reimbursement provision for the government against possible loss caused by private activities.

It is not likely that such inappropriateness and deficiency is the intention of the Korean government and legislators. Article 14 of the Act needs to be revised or supplemented in such a way as to reflect relevant provisions of the Outer Space Treaty and the Liability Convention and be equipped with a provision to protect the government against financial burden that might be caused by private activities.

#### III.5. OTHER PROVISIONS

##### *III.5.1. Rescue and Return*

There are two provisions on rescue and return in the Act. Article 22 of the Act is about the rescue and return of an astronaut aboard a foreign space object who is in the territory of Korea or on the adjacent seas due to emergency landing, distress or accident. The Korean government shall provide possible assistance and return the astronaut to the launching state, the state of registry or the international organization that is re-

sponsible for launching. Article 23 of the Act is about the return of a space object that crashes or makes an emergency landing in the territory of Korea. The Korean government shall return the space object to the launching state, the state of registry or the international organization that is responsible for launching.

These provisions are just incomplete repetition of relevant provisions of the Outer Space Treaty<sup>65</sup> and the Rescue Agreement. They are basically obligations of a state having a bearing on the government and produce no added value as provisions of national space law. In this sense they do not seem to be an indispensable part of national space law. As a state party to the Outer Space Treaty and the Rescue Agreement, Korea is bound to their provisions on rescue and return, regardless of corresponding provisions in the Act.

What is notable is that Articles 22 and 23 of the Act provide that (...) the government shall return astronauts or a foreign space object to the launching state, the state of registry or the international organization which is responsible for the launching of the space object. As to the question on which state astronauts and space objects should be returned to, provisions of the Outer Space Treaty and the Rescue Agreement are not identical. While Articles V and VIII of the Outer Space Treaty provide that astronauts and space objects shall be returned to the state of registry, Articles 4 and 5(3) of the Rescue Agreement require them to be returned to representatives of the launching authority which is defined in Article 6 as the state or international intergovernmental organization responsible for launching.<sup>66</sup> Articles 22 and 23 of the Act seem to be phrased as including both options of the two treaties: the state of registry and the state or international intergovernmental organization responsible for launching.

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<sup>65</sup> See Outer Space Treaty, *supra* note 3, at arts. V & VIII.

<sup>66</sup> Bin Cheng says on the return of astronauts that "a State Party to both treaties can be faced with conflicting treaty obligations. The possibility of returning the astronauts to representatives of the launching authority instead of the launching authority itself, on the other hand, greatly facilitates the task of the territorial State." See BIN CHENG, *STUDIES IN INTERNATIONAL SPACE LAW* 278-9 (1997).

### III.5.2. Accident Investigation

The Act and its follow-up regulation, Presidential Decree to Implement the Space Development Promotion Act have detailed provisions on space accident investigation. Article 16 of the Act provides for the establishment and composition of the Space Accident Investigation Commission under the authority of the Minister of Science and Technology. The Article also enumerates persons whom the Commission may investigate in performing its function.<sup>67</sup>

The Presidential Decree has six articles on space accident investigation. Article 14 of the Decree specifies four categories of accidents to be investigated by the Commission.<sup>68</sup> Article 17 refers to missions of the Commission: finding out the cause of a space accident, collecting and analyzing data relating to a space accident, producing an investigation report on a space accident and other missions necessary for the investigation and analysis of a space accident. Articles 15, 16, 18 and 19 are respectively about the qualification of members of the Commission, its operation, its procedures and a separate Space Accident Investigation Commission to be established for a case related to national security.

There is no particular provision or rule on space accident investigation in space treaties. Thus, a state has discretion to regulate matters on space accident investigation in its national law to the extent that those regulations do not conflict with general rules of international space law and international law in general. Rules on state jurisdiction seem to be relevant, in particular. Article 26<sup>69</sup> of the Convention on International Civil

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<sup>67</sup> They are: (i) a person who made preliminary registration or registration of a space object; (ii) a person who was granted a launch license for a launch vehicle; and (iii) other persons involved in a space object such as its manufacturer or function-tester. Act, *supra* note 1, at art. 16.

<sup>68</sup> See *supra* note 33.

<sup>69</sup> Convention on International Civil Aviation, art. 26, Dec. 7, 1944, 15 U.N.T.S. 295, T.I.A.S. 1591 [hereinafter Chicago Convention]. Article 26 (Investigation of accidents) of the Chicago Convention reads as follows:

In the event of an accident to an aircraft of a contracting State occurring in the territory of another contracting State, and involving death or serious injury, or indicating serious technical defect in the aircraft or air navigation facilities,

Aviation may be a good example for reference. Under the Article the state of the place of accident is to institute an inquiry in the event of an accident and the state of registry is to be given the opportunity to be present at the inquiry as observers.

As shown at Section III.1.2.2. on the jurisdictional scope of the Act, the scope of accidents subject to investigation envisaged by Article 14 of the Presidential Decree is so broad as to possibly include accidents which occur at places outside the jurisdiction of Korea. It makes problem if a space accident falling under the category of Article 14 occurs in the territory of another state, in particular. Article 16(3) of the Act enumerating persons to be subject to investigation may also give rise to difficulties in relation to the exercise of jurisdiction, as already studied in Section III.1.2.2.

In these regards, the provisions on space accident investigation of the Act and the Presidential Decree have gone far in its scope of investigation.

#### IV. CONCLUSION

##### IV.1. GENERAL VIEW OF THE ACT

The Act is a typical national space law and covers various aspects of space or space-related activities. Its provisions can be classified into several categories. One of them is the provisions related to domestic policy and organizational aspects of space development promotion. Another part is the provisions to establish a framework for regulating national space or space-related activities.

As shown by the number and volume of relevant provisions, domestic policy and organizational aspects of space development

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the State in which the accident occurs will institute an inquiry into the circumstances of the accident, in accordance, so far as its law permit, with the procedure which may be recommended by the International Civil Aviation Organization. The State in which the aircraft is registered shall be given the opportunity to appoint observers to be present at the inquiry and the State holding the inquiry shall communicate the report and findings in the matter to that State.

*Id.*

promotion are given considerable weight in the Act. Such a stance of the Act seems to be reflecting the policy line of the Korean government to promote and develop its national space capacity.

Provisions on a regulatory framework are key elements for national space legislation. They comprise articles on license, registration, liability, insurance, accident investigation, punishment of violators and etc. They are based on international space law, especially space treaties to which Korea is a party.<sup>70</sup> Those provisions establish an overall framework for regulating activities, rather than provide detailed substantive rules in each area.

The following table categorizes provisions of the Act according to their contents:

Category	Contents	Articles
General	Purpose of the Act, Definitions, Relation with other laws, Tasks of the government, Confidentiality	Arts 1, 2, 3, 4, 25
Policy and organization for space development Promotion	National space program, National space organization, Utilization of satellite information, Support for private projects, Inter-agency cooperation, Data collection	Arts 5, 6, 7, 17, 18, 20, 21, 24, 26
Regulatory framework	Registration, Launch license, Liability, Insurance, Space accident investigation, Suspension and rectification, Punishment	Arts 8, 9, 10, 11, 12, 13, 14, 15, 16, 19, 27, 28, 29
Others	Rescue and return	Arts 22, 23

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<sup>70</sup> See *supra* note 3.

#### IV.2. ASSESSMENT FROM INTERNATIONAL SPACE LAW PERSPECTIVE

Provisions related to domestic space policy and organizational aspects were not subjects of analysis in this paper. Chapter III has analyzed provisions on a regulatory framework from the international space law perspective, because they are key provisions with international space law implications. Analysis of those provisions has shown that they have the following characteristics and problems, while following and reflecting rules of international space law.

First, the jurisdictional scope of provisions of the Act is in most cases within the limits generally accepted by rules on state jurisdiction of international space law and general international law. However, there are provisions which might lead to excessive jurisdiction if applied strictly. Articles 8(2)② and 11(1)② of the Act and Article 14 of the Presidential Decree for Implementing the Space Development Promotion Act are provisions having potential jurisdictional problems.

Second, the authorization system of the Act is focused on the launch activity of a launch vehicle. A launch license is required only for launching a launch vehicle. There is no authorization requirement for activities involving a space object other than a launch vehicle. Lack of authorization requirement for a space object other than a launch vehicle is not in step with Article VI of the Outer Space Treaty which requires authorization and continuing supervision of the activities of non-governmental entities in outer space by the appropriate State Party.

Third, the provisions of the Act on registration establish a distinctive system of registration of a space object. The two-step system of preliminary registration and after-launch registration is likely to be effective in checking activities involved. A problem is that registration is required only for a space object other than a launch vehicle under the Act. Total exclusion of launch vehicles from the registry is not in conformity with rules of space treaties and state practices on registration.

Fourth, the language of the liability provision, Article 14 of the Act is different from that of relevant provisions of the Outer Space Treaty and the Liability Convention. It has been argued

at Section III.4. that Article 14 of the Act should be viewed as a provision on the liability held domestically or locally for damage caused by a space object. In the same context, there is no indemnification provision for the government in the Act.

#### IV.3. PROPOSAL FOR IMPROVEMENT

Issues and questions raised in the above need to be addressed for the Act to better serve the purpose of the legislation.<sup>71</sup> There may be various solutions to them. Here is suggested a proposal for dealing with them without making major changes to the current provisions of the Act. Technical changes that should follow as a result of the suggested proposal will not be discussed in this paper.

It would be too difficult to find out an optimal wording for each provision which could satisfy both international law rules on state jurisdiction and the need to secure Korea's jurisdiction to the maximum extent permissible. Furthermore, there is no perfectly agreed rule on state jurisdiction over space or space-related activities under international law. Therefore, it is recommendable to introduce a general provision to disown potential jurisdictional problems while keeping provisions in question of the Act as they are now. A provision that the jurisdiction of Korea under the Act is to be exercised in conformity with relevant provisions of space treaties to which Korea is a party and relevant rules of general international law will be an example of such a kind.

Regarding the authorization and supervision of space activities, it is understandable that the Act is concentrating on licensing of activities involving a launch vehicle, for such activities could entail the liability of Korea as a launching state if an accident occurs. Thus, leaving Article 11 on launch license for a launch vehicle as it is, an addition of a general provision purporting to place in principle all kinds of activities under the authorization and supervision of the Korean government would meet the requirement of Article VI of the Outer Space Treaty. A

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<sup>71</sup> About the purpose of the legislation, see *supra* Chapter I.

provision saying that space development<sup>72</sup> is subject to the authorization and continuing supervision of the government to the extent necessary under domestic law and international law will be an example in this regard. Under this suggested provision, the Korean government can have discretion in the extent and mode of its authorization and supervision and prescribe details in its follow-up legislation such as the Presidential Decree or the Regulation of the Ministry of Science and Technology.

There is no reason or justification for the Act to totally and fundamentally exempt a launch vehicle from registration. Simply deleting the phrase “(a launch vehicle to be excluded in respect of this Article and Articles 9 and 10)” can solve the problem in Article 8(1) of the Act. By doing so, provisions on registration will be applicable to a launch vehicle.

In respect of liability and indemnification, a new provision needs to be installed separately from Article 14 of the Act. A provision that Korea is internationally liable for damage caused by its space object in accordance with relevant provisions of the Outer Space Treaty and the Liability Convention and in such a case a person who has launched the space object shall indemnify the Korean government against the claim will be an example. It can complement the current provision on liability of the Act in such a way as to make it compatible with relevant provisions of the Outer Space Treaty and the Liability Convention.

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<sup>72</sup> Article 2(a) of the Act defines space development as one of the following: (i) research and technology development activities related to design, production, launch, operation, etc. of space objects; or (ii) use and exploration of outer space and activities to facilitate them. *See Act, supra* note 1, at art. 2(a).

SPACE DEVELOPMENT PROMOTION ACT OF  
THE REPUBLIC OF KOREA\*

(Promulgated on 31 May 2005 and entered into force on 1 December 2005)

**Article 1 (Purpose)**

This Act is aimed at facilitating the peaceful use and scientific exploration of outer space and contributing to national security, the sound development of national economy and the improvement of people's living, by promoting space development in a systematic way and ensuring the efficient use and administration of space objects.

**Article 2 (Definitions)**

Definitions of terms used in this Act are as follows:

- (a) The term "space development" means one of the following:
  - (i) Research and technology development activities related to design, production, launch, operation, etc. of space objects;
  - (ii) Use and exploration of outer space and activities to facilitate them;
- (b) The term "space development project" means a project to promote space development or a project to pursue the development of education, technology, information, industry, etc. related to space development;
- (c) The term "space object" means an object designed and manufactured for use in outer space, including a launch vehicle, a satellite, a space ship and their components;
- (d) The term "space accident" means an occurrence of damage to life, body or property due to crash, collision or explosion of a space object or other situation;
- (e) The term "satellite information" means image, voice, sound or data acquired by using a satellite, or in-

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\* This English version is an unofficial translation by Yoon Lee.

formation made of their combination, including processed or applied information.

### **Article 3 (Tasks of the Government)**

1. The Government shall observe treaties related to outer space which the Republic of Korea has concluded with other countries or international organizations and seek the peaceful use of outer space.

2. The Government shall formulate and carry out comprehensive policies for space development.

### **Article 4 (Relationship with Other Laws)**

This Act applies to matters relating to the promotion of space development and the use and administration of space objects unless there are special provisions in other laws.

### **Article 5 (Establishment of Basic Program on Space Development Promotion)**

1. The Government shall formulate a basic program on space development promotion (hereafter referred to as the "Basic Program") containing the following items for the promotion of space development and the use and administration of space objects:

- (a) Matters relating to the goal and direction of space development policy;
- (b) Matters relating to the system and strategy for pursuing space development;
- (c) Matters relating to the plan for pursuing space development;
- (d) Matters relating to the expansion of the basis necessary for space development;
- (e) Matters relating to the funding and investment plan for space development;
- (f) Matters relating to the training of expert manpower for space development;
- (g) Matters relating to international cooperation to vitalize space development;
- (h) Matters relating to the promotion of space development projects;

- (i) Matters relating to the use and administration of space objects;
- (j) Matters relating to the utilization of outcomes of space development such as satellite information;
- (k) Other matters to be specified by a Presidential Decree relating to the promotion of space development and the use and administration of space objects.

2. The Government shall formulate the Basic Program every five years and establish it through deliberations by the National Space Committee as provided for in Article 6, paragraph 1. The same applies to a change of the Basic Program. However, it does not apply to a change of minor things to be specified by a Presidential Decree.

3. The Minister of Science and Technology shall make public the Basic Program established in accordance with paragraph 2, and formulate and carry out its implementing plan every year in consultation with heads of central administrative authorities concerned including the Director General of the National Intelligence Service (hereafter the Director General of the National Intelligence Service to be included in heads of central administrative authorities concerned). However, matters related to national security need not to be made public.

#### **Article 6 (National Space Committee)**

1. The National Space Committee (hereafter referred to as the “Committee”) shall be established under the authority of the President in order to deliberate matters relating to space development such as the establishment of the Basic Program.

2. The Committee shall deliberate the following matters. However, deliberations of the Committee may be omitted in respect of (f), if the omission is necessary for reasons such as national security.

- (a) Matters relating to the Basic Program;
- (b) Matters relating to important policies of the Government related to the Basic Program and matters relating to the coordination of major tasks among central administrative authorities concerned including the National Intelligence Service (hereaf-

ter the National Intelligence Service to be included in central administrative authorities concerned);

- (c) Important matters relating to the designation and operation of the Special Agency for Space Development as provided for in Article 7;
- (d) Matters relating to the evaluation on the use and administration of a space development project;
- (e) Matters relating to a funding and investment plan for a space development project;
- (f) Matters relating to a launch license of a space object;
- (g) Matters relating to the rectification of space development as provided for in Article 19, paragraph 2;
- (h) Other matters referred to the Committee by its chairperson.

3. The Committee shall be composed of 15 or less members including the chairperson.

4. The Minister of Science and Technology shall be the chairperson of the Committee and the following persons shall be members of the Committee:

- (a) Heads of central administrative authorities concerned and officials of administrative authorities concerned to be specified by a Presidential Decree
- (b) Individuals with expertise and experiences in the field of space to be appointed by the President

5. The Working-level Committee on Space Development Promotion headed by the Vice-Minister of Science and Technology shall be established under the Committee in order to help the Committee carry out its tasks efficiently.

6. Matters necessary for the composition and operation of the Committee and the Working-level Committee on Space Development Promotion shall be stipulated by a Presidential Decree.

#### **Article 7 (Designation of Special Agency for Space Development)**

1. The Minister of Science and Technology may designate and support a special agency to pursue space development pro-

jects in a systematic and efficient way (hereafter referred to as the “Special Agency for Space Development”).

2. The Special Agency for Space Development shall carry out the following tasks:

- (a) Carrying out of space development projects in accordance with the Basic Program;
- (b) Carrying out of comprehensive tasks such as the development, launch and operation of space objects;
- (c) Other tasks related to space development project to be specified by a Presidential Decree.

3. Necessary matters relating to the criteria for designating the Special Agency for Space Development and relating to support for it shall be stipulated by a Presidential Decree.

#### **Article 8 (Domestic Registration of a Space Object)**

1. A national of the Republic of Korea including a legal person (hereafter a legal person to be included) shall file preliminary registration with the Minister of Science and Technology not later than 180 days before the anticipated date of launch, as shall be stipulated by a Presidential Decree, if the national intends to launch a space object other than a launch vehicle (a launch vehicle to be excluded in respect of this Article and Articles 9 and 10) in or outside the Republic of Korea.

2. Cases where a person who is not a Korean national shall file preliminary registration with the Minister of Science and Technology in accordance with paragraph 1 are as follows:

- (a) When the person intends to launch a space object in the territory of the Republic of Korea or in the area or facility under the jurisdiction of the Republic of Korea;
- (b) When the person intends to launch a space object outside the Republic of Korea by using a launch vehicle owned by the Government or a national of the Republic of Korea.

3. A person who wants to file preliminary registration in accordance with paragraphs 1 and 2 shall enclose a launch plan containing all of the following items:

- (a) Matters relating to the purpose of using the space object;
- (b) Matters relating to the owner of the space object or the holder of the right to use the space object;
- (c) Matters relating to the life expectancy and the duration of use of the space object;
- (d) Matters relating to the place and the anticipated date of launch;
- (e) Matters relating to the basic trajectory of the space object;
- (f) Matters relating to the provider of a launch vehicle to be used for launching the space object and its specifications and functions;
- (g) Matters relating to the discharge of liability for damage in case of a space accident;
- (h) Matters relating to the manufacturer, manufacturing number and date of the space object;
- (i) Other matters relating to the launch, use and administration of the space object, to be specified by a Presidential Decree.

4. If the Minister of Science and Technology, after having reviewed the launch plan provided for in paragraph 3, considers the ability to discharge the liability for damage provided for in Article 14 to be insufficient, the Minister may demand its rectification and supplementation.

5. A person who has filed preliminary registration of a space object in accordance with paragraphs 1 and 2 shall register it with the Minister of Science and Technology within 90 days after its entry into a satellite orbit, as shall be stipulated by a Presidential Decree. However, it does not apply to a space object which has been registered with a foreign country upon agreement with the foreign country to that effect in accordance with the 'Convention on Registration of Objects Launched into Outer Space.'

6. A person who has filed preliminary registration in accordance with paragraphs 1 and 2 or who has registered a space object in accordance with paragraph 5 shall notify the Minister of Science and Technology of a change, if any, in the contents of

items of paragraph 3 within 15 days after his knowledge of the change.

#### **Article 9 (International Registration of a Space Object)**

1. When a space object is registered in accordance with Article 8, paragraph 5, the Minister of Science and Technology shall register the space object with the United Nations via the Minister of Foreign Affairs and Trade in accordance with the 'Convention on Registration of Objects Launched into Outer Space.' However, it does not apply to a satellite which is to be registered with the United Nations in accordance with Article 44, paragraph 1 of the Radio Wave Act.

2. If there arises a change in the contents which have been registered with the United Nations in accordance with paragraph 1 due to reasons such as the completion of life span of a space object, the Minister of Science and Technology shall notify the United Nations of the change via the Minister of Foreign Affairs and Trade.

#### **Article 10 (Administration of Registry)**

The Minister of Science and Technology shall maintain and administer the preliminary registry and the registry for space objects, as shall be stipulated by a Regulation of the Ministry of Science and Technology.

#### **Article 11 (Launch License for a Launch Vehicle)**

1. A person who intends to launch a launch vehicle shall have a license of the Minister of Science and Technology in one of the following cases. The same applies when a person wants to change what has been licensed. However, in case of a change of minor nature to be specified by a Presidential Decree a person shall report it within 30 days after the date of the change.

- (a) When the person intends to launch a launch vehicle in the territory of the Republic of Korea or in the area or facility under the jurisdiction of the Republic of Korea;
- (b) When the person intends to launch outside the Republic of Korea a launch vehicle owned by the

Government or a national of the Republic of Korea.

2. A person who wants to be granted a license in accordance with paragraph 1 shall apply to the Minister of Science and Technology with a launch plan to be specified by a Presidential Decree including a safety analysis report, a payload operation plan and a plan on discharging the liability for damage.

3. The Minister of Science and Technology shall take into consideration the following in granting a license:

- (a) Appropriateness of the purpose of using a launch vehicle;
- (b) Appropriateness of safety management of a launch vehicle and etc to be used for the launch;
- (c) Financial ability such as liability insurance against a space accident;
- (d) Other matters necessary for the launch and launch preparations such as moving a launch vehicle, to be specified by a Regulation of the Ministry of Science and Technology.

4. The Minister of Science and Technology may attach necessary conditions in granting a license in accordance with paragraph 1.

#### **Article 12 (Disqualification)**

A person who falls under one of the following categories may not be granted a launch license provided for in Article 11:

- (a) An incompetent or a quasi-incompetent;
- (b) An insolvent whose rights have not been restored;
- (c) Where a person was in violation of this Act and sentenced to imprisonment, and less than two years have passed since the date of completed execution of the sentence (cases being regarded as completed execution of the sentence to be included) or the date of exemption from its execution;
- (d) A person who was in violation of this Act, sentenced to imprisonment with suspension of its

execution and is now during the suspension period;

- (e) A legal person whose representative is one of the above-mentioned four categories.

### **Article 13 (Revocation of a Launch License and Hearing)**

1. The Minister of Science and Technology may revoke a launch license for a launch vehicle in one of the following cases:

- (a) Where the launch is delayed without justifiable reasons for not less than one year since the licensed anticipated date;
- (b) Where the license is obtained in a deceptive or other wrongful way;
- (c) Where a head of central administrative authorities concerned requests for the revocation of a license due to an anticipated serious threat to national security;
- (d) Where there is a problem in the safety of a launch vehicle such as leakage of fuel or a defect in the communication system before its launch;
- (e) Where a license for a change is not obtained in violation of the latter part of the provisions of Article 11, paragraph 1;
- (f) Where a licensee becomes to fall into one of the categories of Article 12; however, in respect of (e) of Article 12, this provision does not apply when the representative of a legal person in question is replaced within 3 months from the date of having been disqualified.

2. The Minister of Science and Technology shall hold a hearing when the Minister intends to revoke a launch license for a launch vehicle in accordance with paragraph 1. However, a hearing is not necessary in respect of (c) and (d) of paragraph 1.

### **Article 14 (Liability for Damage from Space Accident)**

A person who has launched a space object in accordance with Article 8 or 11 shall bear the liability for damage from a space accident by the space object. Matters such as the scope and limit of liability shall be stipulated by a separate Act.

**Article 15 (Liability Insurance)**

1. A person who wants to be granted a launch license for a launch vehicle in accordance with Article 11 shall be insured against liability, considering the possibility of a space accident, etc.

2. The minimum amount of compensation covered by the insurance to be secured in accordance with paragraph 1 shall be stipulated by a Regulation of the Ministry of Science and Technology taking into consideration domestic and overseas insurance markets.

**Article 16 (Composition of Space Accident Investigation Commission, etc.)**

1. The Minister of Science and Technology may establish a Space Accident Investigation Commission under the authority of the Minister in order to investigate a space accident to be specified by a Presidential Decree.

2. The Space Accident Investigation Commission shall be composed of 5 to 11 members including its chairperson. Members of the Commission shall be appointed by the Minister of Science and Technology from relevant experts and the chairperson shall be chosen by the Minister from the members of the Commission. In respect of matters related to national security to be specified by a Presidential Decree, a separate Space Accident Investigation Commission may be established as shall be stipulated by a Presidential Decree.

3. The Space Accident Investigation Commission may investigate any of the following persons in order to perform its duties. A person who is the object of the investigation shall comply with it unless he has legitimate reasons not to do.

- (a) A person who filed preliminary registration or registered a space object in accordance with Article 8;
- (b) A person who was granted a license for a launch vehicle in accordance with Article 11;
- (c) Other persons involved in a space object such as its manufacturer or a person who tested its function.

4. The Space Accident Investigation Commission may request heads of central administrative authorities concerned to provide cooperation such as entry control of an accident area or other matters necessary for the investigation. When requested, heads of central administrative authorities concerned shall comply with such request, unless they have legitimate reasons not to do.

5. Necessary matters relating to the timing of the composition of the Space Accident Investigation Commission, qualifications of its members and its operation shall be stipulated by a Presidential Decree.

#### **Article 17 (Utilization of Satellite Information)**

1. The Minister of Science and Technology may contrive necessary measures such as the designation or establishment of an organization in charge in order to promote the spread and utilization of satellite information acquired by satellites developed under the Basic Program. In respect of geographic information acquired in accordance with the Act on the Establishment and Utilization of National Geographic Information System, the Minister of Science and Technology shall consult the Minister of Construction and Transportation.

2. The Minister of Science and Technology may provide financial support necessary to promote the spread and utilization of satellite information within the budgetary limit.

3. The Government shall make efforts for the privacy of an individual not to be infringed on in the utilization of satellite information.

#### **Article 18 (Support for Private Space Development Projects)**

1. The Minister of Science and Technology shall contrive supportive measures such as the supply of advanced space development manpower, tax incentive, financial support and priority procurement in order to vitalize space development projects of the private sector and induce the expansion of research and development investment of the private sector.

2. The Minister of Science and Technology may request heads of central administrative authorities concerned to cooperate for supportive measures provided for in paragraph 1.

**Article 19 (Suspension and Rectification of Space Development)**

1. If the Minister of National Defense requests the suspension of space development being carried out by a national of the Republic of Korea on account of a military operation in case of war, disturbances or similar kinds of emergencies, the Minister of Science and Technology shall order the national to suspend space development.

2. If a head of central administrative authorities concerned requests the rectification of space development being carried out by a national of the Republic of Korea on account of the maintenance of public order or national security, the Minister of Science and Technology may, after deliberations by the Committee, order the national to rectify space development.

**Article 20 (Request for Assistance and Cooperation for Space Development)**

1. The Minister of Science and Technology may request heads of central administrative authorities concerned or heads of local governments to provide assistance and cooperation in respect of the following matters, if the Minister considers it necessary for pursuing space development. When requested, heads of central administrative authorities concerned or heads of local governments shall comply with such request, unless they have legitimate reasons not to do.

- (a) Matters relating to the entry control of surrounding areas including territorial sea and air space in relation to domestic launch of a space object;
- (b) Matters relating to communication, firefighting, emergency rescue, safety management, etc.

2. When the Minister of Science and Technology makes a request for assistance and cooperation in accordance with paragraph 1, the Minister shall limit it to the minimum necessary for space development.

**Article 21 (Pursuit of Space Development Project related to National Security)**

1. When the Minister of Science and Technology pushes forward a space development project related to national security, the Minister shall consult heads of central administrative authorities concerned in advance.

2. Necessary matters relating to the establishment and implementation of security measures in relation to the space development project of paragraph 1 shall be stipulated by a Presidential Decree.

**Article 22 (Rescue of Astronauts)**

If astronauts aboard a foreign space object are in the territory of the Republic of Korea or on adjacent high seas due to emergency landing, distress or accident, the Government shall provide possible assistance and return astronauts to the state of launch, the state of registry or the international organization which is responsible for the launch of the space object concerned.

**Article 23 (Return of a Space Object)**

If a foreign space object crashes or makes an emergency landing in the territory of the Republic of Korea, the Government shall return it safely to the state of launch, the state of registry or the international organization which is responsible for the launch of the space object concerned.

**Article 24 (Data Collection and Survey on Space Development, etc.)**

1. The Minister of Science and Technology may collect data or conduct survey on space development and space industry in order to promote space development in a systematic way and carry out space development in an efficient way.

2. The Minister of Science and Technology may request administrative authorities concerned, research institutes, educational institutes and companies to provide data or opinions, if the Minister considers it necessary for domestic survey provided for in paragraph 1.

3. Necessary matters relating to contents, timing and procedure of data collection and survey provided for in paragraph 1 shall be stipulated by a Presidential Decree.

#### **Article 25 (Obligation of Confidentiality)**

A person who is or was engaged in work in accordance with this Act shall not leak a secret obtained during his work or use it for purposes other than for this Act.

#### **Article 26 (Entrusting of Authority)**

The Minister of Science and Technology may, in accordance with the provisions of a Presidential Decree, entrust the following tasks among the Minister's authorities provided for in this Act to a Government-funded research institute or a relevant special institute in the field of science and technology which has been established in accordance with the Act on the Establishment, Management and Promotion of Government-funded Research Institutes in the Field of Science and Technology:

- (a) Safety judgment in relation to granting a license or a license for a change in accordance with Article 11, paragraph 1;
- (b) Matters relating to data collection or survey on space development and space industry in accordance with Article 24.

#### **Article 27 (Penal Regulations)**

1. A person who launched a launch vehicle without a license (including a license for a change, if any) provided for in Article 11, paragraph 1 shall be subject to imprisonment for a period not exceeding 5 years or to a fine not exceeding won 50,000,000.

2. A person who falls under one of the following categories shall be subject to imprisonment for a period not exceeding 3 years or to a fine not exceeding won 30,000,000:

- (a) A person not observing a suspension or rectification order provided for in Article 19;
- (b) A person violating Article 25.

**Article 28 (Dual Punishment)**

Where a representative, an agent or an employee of a legal person, or an agent or an employee of an individual committed a violation provided for in Article 27 in relation to the work of the legal person or the individual, the legal person or the individual shall be also subject to a fine of the same Article, in addition to the punishment of the actor having committed the violation.

**Article 29 (Negligence Fine)**

1. A person who falls under one of the following categories shall be subject to a negligence fine not exceeding won 10,000,000;

- (a) A person who did not file preliminary registration of a space object in violation of Article 8, paragraph 1 or 2;
- (b) A person who did not register a space object in violation of Article 8, paragraph 5;
- (c) A person who did not report a change in violation of the proviso of Article 11, paragraph 1.

2. A person who falls under one of the following categories shall be subject to a negligence fine not exceeding won 5,000,000;

- (a) A person who did not notify a change within 15 days or did notify it falsely in violation of Article 8, paragraph 6;
- (b) A person who refused, obstructed or evaded an accident investigation provided for in Article 16, paragraph 3.

3. Negligence fines provided for in paragraphs 1 and 2 shall be levied and collected by the Minister of Science and Technology, as shall be stipulated by a Presidential Decree.

4. A person who objects to a negligence fine having been imposed in accordance with paragraph 3 may file an objection with the Minister of Science and Technology within 30 days from the date of having been informed of the imposition of the negligence fine.

5. When a person on whom a negligence fine had been imposed in accordance with paragraph 3 filed an objection in ac-

cordance with paragraph 4, the Minister of Science and Technology shall notify the court of jurisdiction of it without delay. The court of jurisdiction which is informed shall judge the case in accordance with the Act on Litigation Procedure for Non-contentious Cases.

6. When neither an objection is filed nor a negligence fine is paid within the period provided for in paragraph 4, the negligence fine will be collected, following the example of a disposition for the recovery of taxes in arrears.

### **Addenda**

1. (Date of Entry into Force) This Act shall enter into force 6 months after of its promulgation.

2. (Interim Measures for Basic Program on Space Development Promotion) Until the basic program on space development promotion is established in accordance with Article 5, the mid-to long-term basic program on space development established through the deliberations of the National Committee on Science and Technology in accordance with the Framework Act on Science and Technology shall be regarded as the basic program on space development promotion.

3. (Interim Measures for Registration of Space Objects) Space objects which the Republic of Korea has registered with the United Nations at the time of the entry into force of this Act shall be regarded as having been registered in accordance with Article 8.

## CHINA'S ASAT TEST: A DEMONSTRATED NEED FOR LEGAL REFORM

*K.K. Nair*\*

China conducted an anti-satellite (ASAT) test on 11 Jan 2007 and, ever since, the space community has been in an agitated state. Apart from international outrage caused by the debris, what has been most shocking is the sheer inability of prevailing legislation to prevent such a debilitating and disastrous action. The test demonstrated the fact that prevailing laws with respect to outer space are in need of dire reform. Most aspects ranging from the delimitation of outer space, to the definitional issues surrounding “peaceful uses of outer space” are yet to be resolved in some acceptable manner. As a matter of fact, capitalising on the prevailing lacunae has become the norm rather than the exception. Thus, prevailing legislation on outer space affairs would need to factor in the existing security, technological, economic and other dynamics to adapt, evolve and prevail for changing times and circumstances.

The Chinese have apparently capitalised on the legal lacunae of Article 4 of the 1967 Outer Space Treaty which states that “...States party to the treaty undertake not to place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction...”<sup>1</sup> Thus, since the Chinese have neither used a nuclear weapon or any other weapon of mass destruction, in strictly legal terms, the test violates no existing legislation. Secondly, the Chinese have destroyed their own *Feng-Yun* satellite and hence it cannot be charged under Article 7 of the Outer Space Treaty which states

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<sup>1</sup> Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, art. 4, Jan. 27, 1967, 610 U.N.S.T. 205 (entered into force Oct. 10, 1967) [hereinafter Outer Space Treaty]. For a more detailed description on space related treaties, agreements and resolutions, visit site of UN Office of Outer Space Affairs at <http://www.unoosa.org/oosa/en/SpaceLaw/treaties.html> (last visited Aug. 10, 2007).

that "...States are internationally liable for damage to another state (and its citizens) caused by its space objects..."<sup>2</sup> Since no international property, that is space assets belonging to other nations, have been as yet damaged by the test, China cannot be charged under this provision. The Liability Convention would apply in case of damage to property of other nations.<sup>3</sup> The Chinese, in this case have destroyed only their own property but any other space assets getting damaged or degraded due to the consequent debris would cause the Chinese to be held accountable for their actions.

Nevertheless, the Chinese can be held accountable for not having fulfilled the provisions of Article-9 of the Outer Space Treaty. Article 9 states that "States must conduct international consultations before proceeding with activities that would cause potentially harmful interference with activities of other parties..."<sup>4</sup> In this case, the Chinese Academy of Launch Vehicle Technology (CALT) is responsible for the manufacture and design of launch vehicles and ballistic missiles. All space launch and tracking is controlled by the General Armaments Department (GAD) of the Peoples Liberation Army (PLA) and *Feng-Yun* (FY) satellites are a product of China's Central Meteorological Bureau and the Shanghai Academy of Space Technology (SAST).<sup>5</sup> All-in-all, the entire interception and destruction is a deliberate Chinese State endeavour. China is not known to have conducted any international consultation prior to the ASAT test which littered debris with enough potential to harm activities of other parties with assets at the same or contiguous altitudes.<sup>6</sup> Secondly, the premise that China underestimated the impact of

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<sup>2</sup> Outer Space Treaty, *supra* note 1, at art. 7.

<sup>3</sup> Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T 2389, T.I.A.S No. 7762 [hereinafter Liability Convention].

<sup>4</sup> Outer Space Treaty, *supra* note 1, at art. 9.

<sup>5</sup> See, K.K. NAIR, SPACE, THE FRONTIERS OF MODERN DEFENCE, 117-133 (Knowledge World Publishers, New Delhi, 2006).

<sup>6</sup> As a matter of fact, for over ten days since the test, China neither admitted to have conducted the test, nor was the US able to elicit a diplomatic response from China on the test. The first admissions by China came in only by January 22, 2007. See, Staff Writers, *China Admits Anti-Satellite Test, Says Not a Threat to Anyone*, SPACE WAR, Jan. 22, 2007, [http://www.spacewar.com/reports/China\\_Admits\\_Anti\\_Satellite\\_Test\\_Says\\_Not\\_A\\_Threat\\_To\\_Anyone\\_999.html](http://www.spacewar.com/reports/China_Admits_Anti_Satellite_Test_Says_Not_A_Threat_To_Anyone_999.html).

harmful debris littering LEO<sup>7</sup> is not plausible in view of the fact that in an earlier instance, on October 4, 1990, the upper stage of China's Long March 4A carrying a FY1-2 weather satellite had exploded littering debris around the altitude of 880-895 kms. Of the 84 debris catalogued on account of the above, up to 68 continue in orbit.<sup>8</sup> Thereafter in 1995, China had joined the Inter Agency Space Debris Coordination Committee and hence the possibility of China having underestimated the impact and effect of the test is remote.

After all is said and done, the test sets a bad precedent. Others could follow suit for military, political or any other consideration. Outer space could soon become unavailable to all humanity. The basic complication is that a large number of nations with a variety of interests and efforts in outer space would need to get down and arrive at a mutually acceptable and workable set of modern legislation on outer space affairs. Most legislation is arcane and while applicable today also, is largely designed for circumstances of the 1960s, 1970s or at best the 1980s. For example, Article 5 of the Outer Space Treaty bestows on space travellers the unique ambassadorial status of "envoys of all mankind" and allows certain privileges to be afforded to such envoys.<sup>9</sup> This is a vestige of the pioneer era when Astronauts and Cosmonauts were personnel of a select calibre, representing their particular States. However, with space tourism in the offing, a variety of passengers are imaginable who would be driven by the quest of pleasure and self-indulgence rather than national pride, scientific pursuit, social welfare, public development or any other such lofty motive. It would be interesting to mull a hypothetical scenario wherein Saudi multimillionaire Osama-Bin-Laden manages a space tour. Whether

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<sup>7</sup> See Agence France-Presse, *US unable to get China to talk about antisatellite weapon test: report*, DEFENCE TALK.COM, Jan 22, 2007, [http://www.defencetalk.com/news/publish/defence/US\\_unable\\_to\\_get\\_China\\_to\\_talk\\_about\\_antisatellite\\_weapon\\_test30010032.php](http://www.defencetalk.com/news/publish/defence/US_unable_to_get_China_to_talk_about_antisatellite_weapon_test30010032.php).

<sup>8</sup> Debris figures sourced from David O. Whitlock, *The History of On-Orbit Satellite Fragmentation*, 27, at table 2.1 (NASA's Orbital Debris Program Offices, 13<sup>th</sup> ed., May 2004).

<sup>9</sup> Outer Space Treaty, *supra* note 1, at art. 5.

the same lofty ambassadorial status would be extended to him is certainly a point worth mulling over.

The new millennium would hence need a new set of revision and reforms which would factor in the prevailing technological, political, commercial and military advances in outer space affairs. The above would demand enormous international effort. Nevertheless, a beginning should be made. Present day legislators, policy makers, non-government organisations, scientists, for instance, would need to explore, revise and reform the existing legalities for the sake of all humanity. To begin with, the issue of militarization and weaponisation would have to be put in the proper perspective. Broadly speaking the term militarization connotes the “non-aggressive” use of the medium of outer space for military functions such as, but not limited to, communications, navigation, and observation. Weaponisation, by contrast, implies the actual placement of weapons, or their use in outer space or from outer space. As most modern militaries across the world use satellites for better communications, navigation, and spying, the same is *fait accompli*, and not much can be done about it. But, weaponisation can surely be prevented for the good of all mankind. The Chinese ASAT test has made it imperative for the world sit together and find a solution for the same.

# LEGAL CERTIFICATION OF DIGITAL DATA: THE EARTH RESOURCES OBSERVATION AND SCIENCE DATA CENTER PROJECT

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*“Most certification today is pure ‘credentialism.’ It must begin to reflect our demand for excellence, not our appreciation of parchment.”*

William J. Bennett, US Secretary of Education, Sept. 3, 1986<sup>1</sup>

## I. INTRODUCTION

Remote sensing is the process of gaining information about an object or phenomenon while at some distance and without any direct contact with it.<sup>2</sup> This information is typically transferred through electromagnetic energy or light. Imagery gathered in this manner can convey complex facts in clear and concise pictures.

Like photographs, films, and videotapes, remote sensing images can help judges and jurors understand aspects of a case

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<sup>1</sup> JAMES B. SIMPSON, SIMPSON'S CONTEMPORARY QUOTATIONS (Houghton Mifflin Company, 1988), <http://www.bartleby.com/63/99/2499.html>.

<sup>2</sup> See ROBERT K. HOLZ, THE SURVEILLANT SCIENCE: REMOTE SENSING OF THE ENVIRONMENT 2 (1985); Sharon Hatch Hodge, *Satellite Data and Environmental Law: Technology Ripe for Litigation Application*, 14 PACE ENVTL. L. REV. 691 (1997).

that could not be brought into the courtroom. Once it is properly authenticated, this type of exhibit is usually admissible if it is helpful to the trier of fact's understanding of the issues. Imagery from satellites, for instance, can assist a judge and jury understand the issues in a case, and it can help maintain interest in otherwise tedious explanations of the complex information.<sup>3</sup>

The Department of Interior's United States Geological Survey at the Earth Resources Observation and Science Data Center (USGS/EROS) uses data collected from remote sensing satellites and other sources in order to provide customers with valuable information regarding Earth's changing land surfaces. USGS/EROS maintains, archives, and manages spatial images received from satellite signals sent directly to EROS or transmitted through ground collection locations. The archive includes aerial photographs taken as early as 1937 and continuing until the 1960s when satellites began producing images of every section of the Earth's surface.

By its charter and mission, USGS/EROS is responsible for providing an objective, accurate, and fair reproduction of the original source images and/or data to its customers. USGS EROS' charter reads in part:

EROS will expand and enhance the use of remote sensing as a tool for Earth and biological sciences, ensuring that monitoring efforts enable integrated science at regional and national scales. ... The EROS Data Center is a national data reception, processing, archiving, distribution, and research facility for remotely sensed data and other forms of geographic information.

It holds the world's largest collection of civilian remotely sensed data covering the Earth's land surface, archiving millions of satellite images and aerial photographs. This archive, co-located with its attendant engineering and scientific exper-

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<sup>3</sup> See Marc Steinberg, *A Picture Can Be Worth a Lot More Than a Thousand Words*, 214 N.Y.L.J. 10 (1995), 6 (Special Pullout Section), at col. 1 [hereinafter Steinberg]. "The greatest challenge facing trial attorneys today is the task of explaining complex legal issues to the lay jury or non-expert judge." See generally, RONALD J. RYCHLAK, REAL AND DEMONSTRATIVE EVIDENCE: APPLICATIONS AND THEORY (LexisNexis 2<sup>nd</sup> ed., 2003).

tise, provides a unique capability for developing and promoting science applications of remotely sensed data to identify, monitor, and understand changes on the landscape and across the interface between nature and society. ... The Land Processes Distributed Active Archive Center (LP DAC), located at EROS, distributed 1.2 million products (94 terabytes of ASTER and MODIS data to all users in the first quarter of 2005. ... 2.7 million products and 232 terabytes of data during all of FY 2004, approximately 22 percent of the data went to NASA data processing users, 7 percent of the data went to NASA science users, and 1.5 percent went to USGS science users. The remainder of the data was distributed to a wide spectrum of users – for education, global climate change research, land management, disaster response, and many other purposes – across the country and the world.<sup>4</sup>

In the past, USGS/EROS certified photographic prints for litigation and other purposes. With advances in technology, there is an increasing demand for USGS/EROS to supply customers with certified digital data instead of prints. In order to make this shift, USGS/EROS and the National Center for Remote Sensing, Air, and Space Law at the University of Mississippi (NCRSASL) undertook a study to determine whether exhibits prepared from digital data, if proper procedures were followed, could be certified so that they would be admitted into evidence during legal proceedings.

Following the study, USGS/EROS and NCRSASL developed a new certification process that will provide the same assurances of reliability with digital data that the old certification process did for photographic prints. The new certification process will consist of transferring downloaded, digital images to the EROS archive, where they will be stored in computer databases. When a customer request for an image is received, USGS/EROS will assign a unique number to that order. This order number will be printed on any CD, DVD, or similar item provided to the customer. It will also be embedded in the digital data requested, and retained in USGS/EROS files. If the data is then used to produce exhibits, opposing counsel or the court will be

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<sup>4</sup> USGS/EROS Charter, 2004 (on file with author).

able to use that order number to verify the validity of the exhibit. As such, properly prepared exhibits should be admissible in court for evidentiary purposes.

## II. EVIDENTIARY FOUNDATIONS

In order to have a real or demonstrative exhibit admitted into evidence, the proponent must lay a foundation for admission. In other words, before the court will receive an exhibit into evidence, it must be persuaded that the exhibit is fair and will help resolve a material issue in the case. The court must also conduct a balancing test, comparing the probative value of the exhibit to its potential to mislead or confuse the finder of fact.<sup>5</sup> Once an exhibit has been admitted into evidence, any other witness may use it without further testimony as to its foundation.

### A. *Photographic Evidence*

Generally, photographic evidence is admissible when it would have been appropriate for the trier of fact to view or examine the subject of the pictures at the time they were taken or when the photos would help the trier of fact better understand an issue in the case. When photographic evidence is relevant, but other considerations argue against its admission, the ruling rests initially with the judge.<sup>6</sup> These matters are normally left to

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<sup>5</sup> Hearsay and best evidence concerns are not part of the traditional foundation; objections as to these matters go to the trustworthiness of the evidence. As such, they should be dealt with before substantive questions concerning the exhibit are asked. There are four general factors that must be met in order to have tangible exhibits admitted into evidence. They are:

- 1) The competency of the witness to present testimony as to the item;
- 2) The relevance of the item to a material issue in the case;
- 3) A showing of identification or authentication that the item really is what it purports to be; and
- 4) A showing that the exhibit has sufficient trustworthiness to be used by the finder of fact.

<sup>6</sup> *United States v. Englebrecht*, 917 F.2d 376 (8<sup>th</sup> Cir. 1990), *cert. denied*, 499 U.S. 912 (1991).

the trial court's sound discretion,<sup>7</sup> and the court's ruling will not be reversed absent an abuse of discretion.<sup>8</sup>

The Federal Rules of Evidence define relevant evidence as "evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence."<sup>9</sup> In addition, some courts require a witness to "identify" the photograph by stating what the photograph shows.<sup>10</sup> The usual course is for a witness on the stand to identify the photograph as a correct representation of events which he saw or of a scene with which he is familiar. In fact he adopts the picture as his testimony, or, in common parlance, uses the picture to illustrate his testimony.<sup>11</sup> The most important thing, when laying the foundation for photographic evidence, is to establish that the photograph fairly and accurately represents its subject.<sup>12</sup>

### B. Scientific Evidence

Prior to 1993, evidence based upon novel scientific or technical processes was admissible only if it had been "sufficiently established to have gained general acceptance in the particular field in which it belongs."<sup>13</sup> This required the proponent to show

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<sup>7</sup> *Id.* (photograph of defendant posing by marijuana plant); *United States v. Harris*, 534 F.2d 207 (10<sup>th</sup> Cir. 1975) (photographs seized in raid on house of prostitution), *cert. denied*, 429 U.S. 941 (1976).

<sup>8</sup> *Young v. Illinois Central Gulf Railroad Co.*, 618 F.2d 332, 338 (5<sup>th</sup> Cir. 1980) (photos illustrating the warning given by railroad crossings were improperly excluded from evidence); *United States v. Blackwell*, 694 F.2d 1325 (D.C. Cir. 1982) (photographs of defendant holding a gun properly admitted).

<sup>9</sup> FED. R. EVID. 401.

<sup>10</sup> *See Lucero v. Stewart*, 892 F.2d 52 (9<sup>th</sup> Cir. 1989); *Tokar v. Crestwood Imports, Inc.*, 532 N.E.2d 382 (Ill. App. 1988); *McKee v. State*, 253 Ala. 235, 44 So. 2d 781 (1949).

<sup>11</sup> FED. R. EVID. 1002 advisory committee's note.

<sup>12</sup> *See Skaggs v. Davis*, 424 N.E. 2d 137 (Ind. App. 1981) (photograph of car properly admitted based on testimony that it accurately represented the car on the day of the accident, despite earlier contrary testimony); *Dillon v. State*, 422 N.E.2d 1188 (1981) (photographs showing victim's facial bruises admitted based on husband's testimony that they accurately depicted her appearance after the attack). *Cf.* *People v. Donaldson*, 181 N.E.2d 131 (Ill. 1962) (inadequate foundation where witness could not testify as to the subject's appearance at the time photograph was taken); *Hayes v. State*, 634 S.W.2d 359 (Tex. Crim. App. 1982) (photograph inadmissible where witness could not state with certainty that it accurately depicted the intersection in question).

<sup>13</sup> *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

that the relevant theory, technique, or instrumentality was generally accepted within the relevant scientific communities. The three foundational requirements were 1) that it be accepted as dependable by members of the profession involved, 2) that the specific instrumentality being used was in good working condition, and 3) that the person who did the work was qualified to do so. This standard was generally referred to as the *Frye* standard, and is still used in some states.<sup>14</sup>

In 1993, the Supreme Court handed down the decision of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, in which the Court concluded that the *Frye* standard is “absent from and incompatible with the Federal Rules of Evidence....”<sup>15</sup> According to the Supreme Court, Rule 702 does not incorporate the “general acceptance” test of *Frye*.

Nothing in the text of this Rule [702] establishes “general acceptance” as an absolute prerequisite to admissibility. Nor does respondent present any clear indication that Rule 702 or the Rules as a whole were intended to incorporate a “general acceptance” standard. The drafting history makes no mention of *Frye*, and a rigid “general acceptance” requirement would be at odds with the “liberal thrust” of the Federal Rules and their “general approach of relaxing the traditional barriers to opinion testimony.”<sup>16</sup>

In summary, with respect to “scientific evidence,” the trial court must make a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically reliable and whether that reasoning or methodology can properly be applied to the facts in issue.

Under the new standard, the trial court must undertake a twofold inquiry. The first prong requires that the evidence must assist the trier of fact. According to the court, this condition goes primarily to relevance. “Expert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful.”<sup>17</sup>

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<sup>14</sup> *Id.* at 1014.

<sup>15</sup> *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 507 U.S. 579, 589 (1993).

<sup>16</sup> *Id.* at 588.

<sup>17</sup> *Id.* at 590-592 (quoting 3 WEINSTEIN & BERGER ¶ 702[02], pp. 702-18).

Evidence must also be relevant and material, and it must not create a risk of confusion on the part of the finder of fact. *Daubert* requires the court to determine whether the evidence should be excluded for some evidentiary reason not related to the issue of new science.

The second prong requires the evidence to amount to “scientific knowledge.” In order to constitute “scientific knowledge,” the evidence must be derived by the scientific method, meaning the evidence must be supported by appropriate scientific validation.

The primary locus of this obligation is Rule 702, which clearly contemplates some degree of regulation of the subjects and theories about which an expert may testify. If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence, or to determine a fact in issue “an expert” may testify thereto. The subject of an expert’s testimony must be “scientific... knowledge.” The adjective “scientific” implies a grounding in the methods and procedures of science. Similarly, the word “knowledge” connotes more than subjective belief or unsupported speculation. The term “applies to any body of known facts or to any body of ideas inferred from such facts or accepted as truths on good grounds.”<sup>18</sup>

The main thrust is no longer to establish that the proposition is generally accepted in the expert’s field. Instead, “the focus... must be solely on principles and methodology, not on the conclusions that they generate.”<sup>19</sup>

Although the case law on digital photographic evidence is sparse, it does not appear that courts allowing these exhibits into evidence are subjecting them to either the *Daubert* or *Frye* test.<sup>20</sup> This is probably because digital data has been sufficiently accepted so as to obviate the need for testimony on these matters. If, however, a court were to subject digital images to either *Daubert* or *Frye*, litigants should be able to meet either

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<sup>18</sup> *Id.* at 589, 590.

<sup>19</sup> *Id.* at 595.

<sup>20</sup> Brian Barakat & Bronwyn Miller, *Authentication of Digital Photographs under the “Pictorial Testimony” Theory*, FLA.L.B.J. 38 (July/Aug. 2004)

burden. Satellite imagery and digital data are both sufficiently well established to meet those tests.

### *C. Judicial Notice*

When a new scientific process is first used to prepare an exhibit in court, the proponent must satisfy the relevant standard to show that the science underlying the exhibit is valid. Thus, when photographs were first offered into evidence, the proponent had to explain the workings of a camera and prove that they rendered reliable images. After courts have seen these new exhibits and accepted them into evidence several times, the proponent will no longer be required to prove the science behind the process; the court will take judicial notice of it. Continuing our example, at some point in time, proponents no longer had to explain how the camera worked; that part of the process was accepted by the court.

Federal Rule of Evidence 102(b) allows a judge to take judicial notice of an adjudicative fact when it is “not subject to reasonable dispute in that it is either (1) generally known within the territorial jurisdiction of the trial court or (2) capable of accurate and ready determination by resort to sources whose accuracy cannot reasonably be questioned.”<sup>21</sup> Courts have taken judicial notice of the process used to capture and produce traditional photographs. It is safe to assume that digital photographs will eventually reach the same status as traditional photographs, if they have not already done so. As more digital photographs are admitted as exhibits into court proceedings, courts will begin to take judicial notice without inquiring into the process used to capture, store, and produce digital images.<sup>22</sup>

## III. SATELLITE-BASED EXHIBITS

Satellite data can often provide the only visual evidence that captures an event. Nevertheless, more than thirty years since the first release of satellite data for non-military uses has

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<sup>21</sup> FED. R. EVID. 102(b).

<sup>22</sup> It should be noted that judicial notice does not preclude a court from determining whether an image is relevant and the proponent has laid the proper foundation.

passed, the technology remains greatly under-utilized by the legal community. The prospect for future use of this technology in the courtroom, however, seems to be increasingly promising.

The advent of Google Maps, including satellite imagery, and similar services making satellite imagery-based consumer products commonplace, is accelerating the attention paid by attorneys and the court, and they are beginning to use spatial information more and more often. Cases known by the authors to have used satellite imagery and related spatial information (aerial photographs, geographic information systems and global positioning system data) include: automobile accidents, automobile and train accidents, environmental disputes, toxic torts, environmental justice, petroleum refinery class actions, chemical plant class actions, Katrina-related damage claims, and many others.

One example of the power and importance of spatial information, and credibility and veracity of our nation's spatial information archive, is its use by parties on both sides of disputes arising out of the aftermath of Hurricane Katrina.

One Mississippi Gulf Coast resident appeared to be the only person in Mississippi who had secured payment from his insurer for wind damage from hurricane Katrina in the first few months following Hurricane Katrina.. His residence in Bay Saint Louis, Mississippi is a total loss, with only debris remaining on the property.

When homeowner "Jones" (a pseudonym) met his insurer's damage assessment team, he was told that he would probably receive a payout on his Federal Flood Insurance policy and his Mississippi Wind Pool insurance policies, but because the damage was caused primarily by surge and flooding, he would not be receive any payment from his homeowner's policy. Mr. Jones produced and shared with the adjustment team aerial and satellite imagery along with National Weather Service exhibits. It was clear from these exhibits that his home experienced several hours of winds in excess of 100 mph, which caused significant, if not total loss damage well before the floodwaters and storm surge came ashore at his location. Upon close examination of Mr. Jones' spatial information, the assessment team decided to pay the full value of his policy. Other home owners are using

similar spatial information to understand what caused the destruction of their homes and as evidence for legal decision-makers who are charged with deciding many of these cases.

Similar to Mr. Jones' case, an internationally recognized plaintiff's lawyer recently has repeatedly used spatial information at trial and in settlement negotiations to successfully gain fair treatment for thousands of homeowners along the Gulf Coast (e.g., *Leonard v. Nationwide Civil Action*, No.1:05CV475 LTS-RHW (Miss. 2006)).

Another example of the value Earth imaging provides to legal decision-makers involved a dump truck driver who was struck by a freight train while proceeding across an un-gated railroad crossing. One of the key pieces of evidence in the trial was a series of aerial photographs and satellite images, some obtained from USGS/EROS Data Center. The time series analysis covered the period from 1938 through 2005, and was used to objectively understand and communicate how the railroad company maintained their right of way. This was important because the plaintiff alleged he didn't see the train due to heavy vegetation on railroad right of way. Analysis of the imagery revealed that the railroad company appeared to consistently keep its right of way trimmed and that there was some vegetation on private property that could have obscured the driver's line of sight. Based in part on the spatial evidence, the jury found for the defendant. After the case was decided by the jury, discussions with attorneys and jurors revealed that the aerial photographs and satellite imagery offered into evidence was very helpful in their understanding of the issues from an objective perspective. It seems that in some cases, not only is a picture worth a thousand words, but it may be the most revealing and understandable evidence offered in a complex case.

#### A. Security Concerns

The admissibility of domestic satellite evidence that might otherwise be considered confidential was addressed in the landmark case of *Dow Chemical Company v. United States*.<sup>23</sup> In

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<sup>23</sup> *Dow Chemical Company v. United States*, 476 U.S. 227 (1986).

that case, Dow objected on privacy grounds to the use of aerial photography that provided excellent, detailed images of a large industrial complex. The trial court found remote sensing more invasive than the human eye and concluded that information that could be derived from the data violated Dow's expectation of privacy.<sup>24</sup> The Supreme Court, however, held that "the mere fact that human vision is enhanced somewhat... does not give rise to constitutional problems."<sup>25</sup> The aerial search of a large industrial complex for investigatory purposes did not violate Dow's protection against warrantless searches or expectation of privacy.<sup>26</sup>

At the international level, satellite imagery has been used by the International Court of Justice in boundary dispute cases and arbitrations. "[T]he use of satellite data as evidence before national and international courts has been characterized as a "matter of concern in the legal world, particularly in certain instances in court proceedings...the use of satellite data in international litigation will become a matter of routine in a not dis-

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<sup>24</sup> *Id.* at 227. The attorney for the defendant, Jane M. Gootee, presented her perspective and provided suggestions when using remote sensing in environmental enforcement, defense, and litigation. See Jane M. Gootee, *Aerial Searches: A Defendant's Perspective -Dow Chemical v. United States*, in *Earth Observation Systems: Legal Considerations for the '90s*, 42 (American Society for Photogrammetry and Remote Sensing and American Bar Association, 1990).

<sup>25</sup> *Dow Chemical*, 476 U.S. at 238. The court noted, however, that privacy expectations for the private residence are higher because the private residence is the place of "intimate activities associated with family privacy," and the expectation of such privacy is not reasonably or legitimately extended to an industrial complex. See *id.* at 228.

<sup>26</sup> In *State of Washington v. Jackson*, 46 P.3d 257 (Wash. Ct. App. 2002), the defendant was convicted of first-degree murder, and he appealed. The Court of Appeals held, in part, that:

in a matter of first impression, police installation of Global Positioning System (GPS) tracking device on defendant's vehicles did not offend either Fourth Amendment or state constitutional provision protecting a person's home and private affairs from warrantless searches; (4) seeking grant of judicial permission in form of search warrant to install GPS tracking devices on defendant's vehicles was appropriate."

Defendant's privacy interests were insufficient to require warrants, given that monitoring of his public travels in his truck by use of GPS device was merely sense augmenting, revealing open view information of what might easily have been seen from lawful vantage point without such aids.

tant future [therefore] some kind of basic rules ought to be developed to smoothen the transition to the new technology."<sup>27</sup>

### B. Foundations and Objections

In general, the reliability of evidence derived from a scientific theory or principle depends on three factors: 1) the validity of the underlying theory, 2) the validity of the technique applying that theory, and 3) the proper application of the technique on a particular occasion.<sup>28</sup> This includes insuring the proper working order of instrumentation, following proper procedures, and employing properly qualified persons using the technique and interpreting the results.

Courts are already familiar with aerial photographs. Like other photographs, they are admitted if they are relevant, accurate, and a proper foundation is laid.<sup>29</sup> Satellite images are similar. They can assist a jury in understanding the issues, and can help maintain interest in explanations of complex information.<sup>30</sup> In addition, these pictures are often the only evidence that fully captures an event.<sup>31</sup> In order to use satellite data, the proponent must qualify his expert witnesses,<sup>32</sup> authenticate and prove the

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<sup>27</sup> Maureen Williams, *Space Law and Remote Sensing Activities Discussion Paper*, U.N./Brazil Workshop Disseminating and Developing International and National Space Law: the Latin American & Caribbean Perspective at 295 (2004), available at [http://www.unoosa.org/pdf/publications/st\\_space\\_28E.pdf](http://www.unoosa.org/pdf/publications/st_space_28E.pdf).

<sup>28</sup> PAUL C. GIANNELLI & EDWARD J. IMWINKELRIED, 1 SCIENTIFIC EVIDENCE 1-2 (1993).

<sup>29</sup> *Hubert v. City of Marietta*, 224 Ga. 706, 164 S.E.2d 832, 834 (1968) (foundation laid when knowledgeable witness testified that aerial photograph was accurate).

<sup>30</sup> See Steinberg, *supra* note 3, at 10 ("The greatest challenge facing trial attorneys today is the task of explaining complex legal issues to the lay jury or non-expert judge.").

<sup>31</sup> See, e.g., *NutraSweet Co. v. X-L Engineering Co.*, 227 F.3d 776 (7<sup>th</sup> Cir. 2000) (plaintiffs used aerial photographs to establish the dumping sequence in which Volatile Organic Compounds were dumped on X-L's land and then migrated through the groundwater onto NutraSweet's land); *St. Martin v. Mobil Exploration & Producing U.S. Inc.*, 224 F.3d 402 (5<sup>th</sup> Cir. 2000) (plaintiffs introduced aerial photographs to show open ponds produced by the oil companies that were eroding their marsh, presenting a series of photographs that showed the progression of the deterioration of the marsh); *In re Vernon Sand & Gravel, Inc.*, 93 B.R. 580 (Bkrcty. N.D. Ohio 1988) (aerial photographs were found to be determinative on the question of a discrepancy as to the acreage of land involved).

<sup>32</sup> The proponent will need to consider witnesses who can (a) testify about the accuracy and reliability of the technology, the equipment, the processing techniques; (b) certify the data supplier's possession and transfer of custody of the images prior to trial;

contents of the data, and establish that proper and accepted digital imagery processing techniques were used. The need for the latter two steps arises particularly because digital satellite imagery can easily be manipulated. In fact, satellite data are almost always manipulated.<sup>33</sup> Therefore, it is essential to establish the authenticity of the data and trace its chain of custody so as to demonstrate to the court that it has not been inappropriately manipulated or altered.

Federal Rule of Evidence 901(B)(9) allows “evidence describing a process or system used to produce a result and showing that the process or system produces an accurate result.” This may be established by testimony that the satellite data collection company and the transporter properly handled the data and that the expert who processed and interpreted the data used an approved scientific method. The authenticating witness must be familiar with the field and office procedures that produced the exhibit and be able to explain why errors and mis-

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and (c) reference similar more conventional data (aerial photographs, maps) and any other factors that would dispel the fear of possible manipulation of the images. Furthermore, the best expert witnesses would be able not only to authenticate the data but also to explain it in a manner that the average juror can understand. *See* RYCHLAK, *supra* note 3, at 477 (“Hiring an Expert”). *See also* *St. Martin v. Mobil Exploration & Producing U.S. Inc.*, 224 F.3d 402 (5<sup>th</sup> Cir. 2000) (aerial photos, combined with testimony from an expert witness and testimony from others familiar with the land, led the court to conclude that defendants caused the degradation to the land.); *United States v. Lopez-Lopez*, 282 F.3d 1 (1<sup>st</sup> Cir. 2002) (customs Service agent could testify as expert in drug case to explain how drug importation schemes use Global Positioning System to facilitate air drops and boat-to-boat transfers); *Johnson v. Hamrick*, 155 F. Supp.2d 1355 (N.D. Ga. 2001) (black citizens brought action challenging city’s at-large system for electing city council; plaintiffs tendered an expert in GIS who used GIS software to create a proposed districting system). *But see* *Velsicol Chemical Corp. v. State, Dept. of Environmental Protection*, 442 A.2d 1051 (N.J. Super. Ct. App. Div. 1982) (court found that “maps and overlays which showed the incidence of mean high tide flow, based upon infrared aerial photographs, and which were based upon a report of natural color photography and of field observation was insufficient to sustain State’s burden of proof where no witnesses responsible for preparation of report testified to application therein of biological methodology, its gathering, collating and analysis of scientific data.”).

<sup>33</sup> In *State v. Wright*, 752 A.2d 1147 (Conn. App. 2000), the defendant was convicted of drug offenses and he appealed. The Appellate Court held that a computer-generated engineering map showing that defendant’s residence was 1125 feet from an elementary school was admissible. A GIS technician testified that he went to the actual locations depicted on the map to determine their locations, and that the coordination system that formed the basis of the map generation was checked by the state and by private engineering companies and that the map was a fair and accurate representation of the distance.

takes are unlikely to have crept into the system.<sup>34</sup> The data suppliers should be able to certify that proper, accepted digital imagery processing techniques were employed and that the satellite images were produced by the data processor in a routine way.<sup>35</sup> Other bases for admissibility of satellite data include the hearsay exceptions in Rules 803(6) and 803(8) for business or public records,<sup>36</sup> or the silent witness exception, which relates to devices that accurately record events when they occur.<sup>37</sup>

Satellite images can be presented in the form of charts, summaries, or calculations and allowed as evidence under Federal Rules of Evidence 1006.<sup>38</sup> The data may also be presented as an illustration of a witness's testimony.<sup>39</sup> If an enhanced im-

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<sup>34</sup> See *Velsicol Chemical Corp. v. State, Dept. of Environmental Protection*, 442 A.2d 1051 (N.J. Super. Ct. App. Div. 1982) (court found that "maps and overlays which showed the incidence of mean high tide flow, based upon infra-red aerial photographs, and which were based upon a report of natural color photography and of field observation was insufficient to sustain State's burden of proof where no witnesses responsible for preparation of report to testified to application therein of biological methodology, its gathering, collating and analysis of scientific data.").

<sup>35</sup> FED. R. EVID. 406; See also Carole E. Powell, *Computer Generated Visual Evidence: Does Daubert Make a Difference?*, 12 GA. ST. U. L. REV. 577, 585 (1996).

<sup>36</sup> Gregory P. Joseph, *Computer Evidence*, 22 LITIG. 4 (Fall 1995); Andrew C. Wilson et al., *Tracking Spills and Releases: High-tech in the Courtroom*, 10 TUL. ENVTL. L.J. 371 (1997). The vast majority of computer-generated documents reaching the courtroom today do so under the business records exception. However, in regard to GIS data, other potential routes for admissibility are through an exception for public records maintained by a public agency, through other statutory exceptions, as demonstrative evidence to aid the trier of fact (i.e. jury) in understanding testimony, or for the limited purposes of showing the basis of an expert's opinion. Harlan J. Onsrud, *Evidence Generated from GIS*, available at [http://www.spatial.maine.edu/~onsrud/pubs/GIS\\_Evidence.html](http://www.spatial.maine.edu/~onsrud/pubs/GIS_Evidence.html). See also *United States v. Asarco Inc.*, 214 F.3d 1104 (9<sup>th</sup> Cir. 2000) (court found that a GIS database was part of the EPA's administrative record).

<sup>37</sup> See Mario Borelli, *The Computer as Advocate: An Approach to Computer Generated Displays in the Courtroom*, 71 IND. L.J. 439, 446 (1996); Andrew C. Wilson et al., *Tracking Spills and Releases: High-tech in the Courtroom*, 10 TUL. ENVTL. L.J. 371 (1997).

<sup>38</sup> FED. R. EVID. 1006 provides that "[t]he contents or voluminous writings, recordings, or photographs which cannot conveniently be examined in court may be presented in the form of a chart, summary, or calculation." See generally Hodge, *supra* note 2, at 718; Howard A. Latin et al., *Remote Sensing Evidence and Environmental Law*, 64 (6) CAL. L. REV., 1300, 1443 (Dec. 1976).

<sup>39</sup> See Latin, *supra* note 38, at 1441. The introduction of satellite imagery in conjunction with an expert's testimony may also counter an opponent's objection that any such evidence should be excluded as hearsay. Under Fed. R. Evid. 703, expert testimony may include hearsay if the basis of the testimony is reasonably relied upon by members of the expert's field. *United States v. Elkins*, 885 F.2d 775 (11<sup>th</sup> Cir. 1989), *cert. denied*,

age is submitted as independent evidence, the data must be authenticated according to Federal Rule of Evidence 901(b)(9).<sup>40</sup>

Under FRE 901(a), the chain of custody must be shown when the condition of the evidence is at issue, which can happen when the evidence is satellite data.<sup>41</sup> To establish the chain, the proponent must show: 1) the accuracy and reliability of the data, including all formulas, calculations, and assumptions used in defining and analyzing it, 2) the accuracy of the data as it was entered into the computer, 3) the reliability and capability of the computer hardware and software, 4) the process of software used for the computer graphics, and 5) the reliability of the final presentation. The data supplier can usually support links in the chain of custody with certification of the data,<sup>42</sup> and demonstrate that data security within the workplace was maintained at all times.

In addition, FRE 406, which relates to the routine practice of the person or organization, can be used to support the chain of custody.<sup>43</sup> Also, a chain of custody document can be developed which allows a supervisor to confirm the chain. The expert who processed the data may be in the best position to testify about the chain of custody of satellite data.<sup>44</sup>

If the exhibit is inadmissible due to failure to meet a hearsay exception or failure to meet authentication requirements, it

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494 U.S. 1005 (1989). *Accord* Grimes v. Employers Mut. Liability Ins. Co., 73 F.R.D. 607, 611 (D.C. Alaska 1977).

<sup>40</sup> See FRE 901 (b)(9) requires that the party present proof that the process or system used produces an accurate result. The best evidence rule requires that an original writing, recording or photograph be used before a secondary source can be admitted, but this would not normally present a serious problem. See FED. R. EVID. 1002.

<sup>41</sup> The federal courts are split regarding chain of custody requirements under the FRE. See GIANNELLI, *supra* note 28, at 208.

<sup>42</sup> Hodge, *supra* note 2.

<sup>43</sup> FED. R. EVID. 406 (Routine Practice of Person or Organization). See GIANNELLI, *supra* 28, at 212.

<sup>44</sup> In *Velsicol Chemical Corp. v. State, Dept. of Environmental Protection*, 442 A.2d 1051 (N.J. Super. Ct. App. Div. 1982), the court found that maps and overlays showing the incidence of mean high tide flow, based upon infra-red aerial photographs and based upon a report of natural color photography and of field observation, were insufficient to sustain State's burden of proof where no witness responsible for preparation of report testified to application therein of biological methodology, its gathering, collating and analysis of scientific data.

may be possible to use it simply to illustrate the testimony of a witness.

### *C. Similar forms of Remote Sensing Evidence*

In general, the rules that apply to satellite digital data also apply to other evidence that is not visible to the naked eye, such as X-ray evidence. Unlike regular photographs, exhibits prepared with remote sensing data, whether satellite data or X-rays, show scenes that are not visible to the naked eye. This makes a big difference in what must be done to establish the foundation, because no witness is able to testify that the exhibit is a fair and accurate representation of a scene with which he or she is familiar.

In cases in which it is not possible to have a person testify that the exhibit accurately and fairly depicts a scene with which he or she is familiar, the foundation may be established with testimony regarding the process used to create the exhibit and internal identification procedures. This may include a sort of "chain" testimony, or a court's willingness to accept testimony related to the exhibit, despite relatively weak foundational support.<sup>45</sup>

Some courts have held that the silent witness theory, which treats remotely-sensed exhibits as self-authenticating, applies to common exhibits, like X-ray evidence. These courts essentially presume the reliability of the X-ray and identification procedures used by a hospital.

Modern day practice is such that the radiologist very likely does not see the patient, the treating doctor is not present when the X-rays are exposed or read, and he may well rely heavily upon the radiologist's report in diagnosing and treating his patient's condition. X-rays are made with proper identifying marks and the trained radiologist can determine from the film itself as to whether the exposure is proper and the film diagnostic. When

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<sup>45</sup> See *People v. Beasley*, 109 Ill. App. 3d 446, 440 N.E.2d 961 (1982) (photographic enlargements of fingerprints admitted without testimony establishing an accurate representation when a latent-print examiner testified that he had prepared the enlargements and identified them as defendant's prints).

these safeguards are accepted in the hospital, we see no reason why they should not be similarly accepted in court.<sup>46</sup>

Other courts have allowed testimony by physicians to establish authenticity, even though they were not present at the taking of the X-rays.<sup>47</sup>

The second part of the foundation for remotely-sensed exhibits is proving that the exhibit accurately reflects the scene it purports to depict. When it comes to X-rays, this can be accomplished by having the expert testify as to what he or she saw through a microscope or fluoroscope, or by proving skill in technique, that the equipment was in good working order and was used properly, the manner in which the X-ray was taken, and by offering the expert's opinion of the validity of the X-ray based on his or her experience.<sup>48</sup>

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<sup>46</sup> *Banks v. Bowman Dairy Co.*, 65 Ill. App. 2d 113, 116-17, 212 N.E.2d 4, 6 (1965). *See also Hoffman v. City of New York*, 535 N.Y.S.2d 342 (N.Y. Sup. 1988) (admissible as "business records"); *King v. Williams*, 279 S.E.2d 618 (S.C. 1981) (hospital chain of possession); *Texaco, Inc. v. Pursley*, 527 S.W.2d 236 (Tex. App. 1975) (hospital records of X-rays supported their admission).

<sup>47</sup> *See Texaco, Inc. v. Pursley*, 527 S.W.2d 236 (Tex. App. 1975); *Oxford v. Villines*, 232 Ark. 103, 334 S.W.2d 660 (1960); *Chailland v. Smiley*, 363 S.W.2d 619 (Mo. 1963) (en banc). *But see Woodruff v. Naik*, 351 S.E.2d 233 (Ga. App. 1986) (improper qualification of foundation witness). If the court requires strict authentication, the foundation can be difficult to establish. First, the proponent will have to establish that the X-ray is of the person, or the anatomical part, or the object lodged in the anatomy that it purports to be.

*See United States v. La Favor*, 72 F.2d 827 (9<sup>th</sup> Cir. 1934) (identification held insufficient); *T.C. Young Constr. Co. v. Brown*, 372 S.W.2d 670, 673 (Ky. 1963) (identification sufficient). This can usually be done with the testimony of a qualified expert such as a physician or X-ray technician. *See Chailland v. Smiley*, 363 S.W.2d 619 (Mo. 1963) (en banc). Another way of identifying the X-ray is with the procedure that the hospital uses to identify the X-ray, which is usually done by marking the X-ray with the person's name and the date when the X-ray is taken. In *United States v. Goslee*, 389 F. Supp. 490 (W.D. Pa. 1975), the court held that X-rays are to be routinely admitted into evidence, even though no one can actually verify that a specific X-ray is accurate, because the X-ray process as a whole is considered to be reliable and accurate. Labels on an X-ray, which identify it as the X-ray of a certain person could constitute hearsay if offered to prove whose X-ray it is, but they would likely come under the business records exception. Fed. R. Evid. 803(6). CAT scans, magnetic resonance images, and sonograms that are labeled by typing the identification into the computer that is used to process the images would be treated similarly. In such a case, an X-ray technician or attending physician can corroborate identification. *See Harth v. Nicholas Liakis & Son, Inc.*, 103 Misc. 2d 217, 425 N.Y.S.2d 523 (1980); *see* 5 A.L.R. 3d 327.

<sup>48</sup> In *Bayou Des Families Development Corporation v. U.S. Corps of Engineers*, 541 F. Supp. 1025 (E.D. La. 1982), the District Court held that Army Corps of Engineers did not abuse its discretion in denying developer's after-the-fact application for a permit to

In order to show that the equipment was dependable and in good working order, the proponent will have to prove that the particular machine in question works well, not just the X-ray process in general. This burden can usually be met by showing that the machine used was of standard quality.<sup>49</sup>

In addition, it may be necessary to prove that the operator was sufficiently qualified to operate the machine.<sup>50</sup> When it comes to X-rays, the operator may be a physician, but a medical degree is not necessary. X-rays are usually taken by or under the supervision of a radiologist, and he or she should be able to testify that the X-rays are accurate representations and should be admitted into evidence.<sup>51</sup>

There is also sort of a "changed circumstances" issue that must be resolved with remotely-sensed evidence. The proponent of the evidence must establish the similarity of the scene depicted in the exhibit and the scene at the time relevant to the trial. The fact that the image was captured weeks or months after the event in question does not necessarily affect its evidentiary value, as long as there is proof that the condition portrayed in the exhibit remained essentially unchanged from the time of the event to the time that the image was captured.<sup>52</sup>

#### IV. USGS

USGS/EROS maintains a comprehensive archive of the planet's land surface. It provides scientists, the U.S. government, and many other organizations invaluable information re-

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construct a levee and pumping station to facilitate development. An expert used remote sensing to show indications of wetland hydrology. The court stated, "Dr. Huffman is trained in remote sensing techniques. His examination of aerial infra-red photographs of the area taken in 1978, 1974, and 1973, together with his on-site investigation, led him to the opinion that the entire area in question... is and has been continuously since at least 1970 a wetland."

<sup>49</sup> See *Lackenmeyer v. Glotfelty*, 284 Ill. App. 397, 2 N.E.2d 180, 185 (1936); *Eaker v. International Shoe Co.*, 154 S.E. 667 (N.C. 1930).

<sup>50</sup> See *Woodruff v. Naik*, 351 S.E.2d 233 (Ga. App. 1986) (lack of witness qualifications held harmless error); *Howell v. George*, 30 So. 2d 603 (Miss. 1947) (sufficient to show X-ray was made by regular operator at hospital).

<sup>51</sup> *Williams v. Atruda*, 58 A.2d 562 (R.I. 1948).

<sup>52</sup> See *Cooney v. Hughes*, 310 Ill. App. 371, 34 N.E.2d 566 (1941) (no error in admitting X-ray taken 17 months after injury).

lating to changes in the Earth's surface. This information can aid in understanding previous environments, reviewing existing conditions, preparing for potential disasters, and predicting potential outcomes. As such, it can be invaluable for litigation purposes.

#### *A. Digital Photographic Evidence*

The most fundamental difference between traditional and digital photographs is how they are captured and stored. Digital image data are stored in electronic pixels, which are digital values conveying position and specific value (usually color). Analog images are captured and stored in film negatives, which are analog values captured in physically tangible media.

As with traditional photographs, digital images are admissible in court if they are relevant to an issue, accurately portray the scene, and are established by a proper foundation.<sup>53</sup> It would normally be sufficient, as it is with traditional photographs, to present a witness's testimony that the photograph is a fair and accurate portrayal of the scene, regardless of how the image was captured.<sup>54</sup> As the Supreme Court of Georgia stated in *Almond v. State*: "we are aware of no authority, and appellant cites none, for the proposition that the procedure for admitting pictures should be any different when they were taken by a digital camera."<sup>55</sup> However, since a witness is almost never able to testify as to whether the digital data received by USGS/EROS is a fair and accurate portrayal of the scene, the foundation must be established using other methods. A proper foundation may include proving the authenticity of the image and its contents, showing that accepted processing techniques were used, or detailing a chain of custody.

#### *B. Previous and Current Procedures*

Beginning in the 1970s, USGS/EROS collected image data from satellites, stored the data collected in a secure location,

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<sup>53</sup> RYCHLAK, *supra* note 3, at 505.

<sup>54</sup> *State v. Wilson*, 135 N.J. 4, 15, 637 A.2d 1237 (1994).

<sup>55</sup> *Almond v. State*, 274 Ga. 348, 553 S.E. 2d 803 (2001).

and provided customers with physical, photographic, print-out copies of the images. Upon request, USGS/EROS would provide a certified copy of an image. This was particularly helpful to litigants who wanted to use such images in court.

The certification process for photographic images involved: 1) providing a statement describing the copy or reproduction requested; 2) affixing the USGS seal to the reproduced data; and 3) supplying a signature that provided the source or authenticity of the data.<sup>56</sup> These steps assured the customer that he or she had received a true copy of the information contained in the USGS/EROS files. Certified copies of the images were routinely accepted into evidence during courtroom proceedings based on the process used by USGS/EROS to collect, store, and reproduce the data, even though there was almost never a witness available to testify that the exhibit was a “fair and accurate” depiction of the scene.

In recent years, customer demands for physical printouts have decreased, while production costs of generating physical printouts have increased. At the same time, several suppliers have discontinued providing the raw materials needed to produce the printouts and have converted to digital products. Due to these changes, USGS/EROS has made the decision to provide customers with digital data compiled on DVDs, CDs, or in other formats.

With digital data, it is no longer possible to certify that a photograph delivered to a customer is a true copy of an image stored in USGS/EROS archives. As such, USGS/EROS contacted the NCRSASL to develop a procedure that would permit data to be certified in a way that would satisfy the evidentiary of litigation. The new certification process, set forth below, does that. It provides the same level of assurance to the customer and to the court that the old process did. As a result, exhibits

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<sup>56</sup> USGS/EROS certification is done in accordance with The Department of Interior Manual. See Department of Interior Departmental Manual, *Certification of Documents*, Part 310, Ch. 10 (2003), available at [http://elips.doi.gov/elips/DM\\_word/3562.doc](http://elips.doi.gov/elips/DM_word/3562.doc).

prepared from digital data provided by USGS/EROS should be fully admissible in court.<sup>57</sup>

Under the new process, USGS/EROS will download images in digital format from remote sensing satellites, and then transfer the data to the EROS archive in Sioux Falls, South Dakota where they will be stored in computer databases. When USGS/EROS receives a request for data, it will assign a unique product number to each order and provide the requested data to the customer in digital format. The product order number will be printed on the CD or DVD, imbedded in the digital data, and retained in USGS/EROS files.

This digital certification will verify that the data provided to the customer is the same data that is contained in the USGS/EROS archives. Once the digital data have left that USGS/EROS facility, they are subject to manipulation. In fact, there will almost always be a certain amount of manipulation, just so that the data can be converted into a usable format, such as a printout. It is also reasonable to assume that litigants will use magnification, colorization, and other process to make the exhibit clear to the finder of fact.

If a party has made a legitimate modification for clarity or visibility, that party should be able to provide the USGS/EROS product order number and other relevant information (such as changes made for purposes of clarity)<sup>58</sup> to the court or opposing party so that a fair evaluation can be made. With this new digital certification process, it should be easy to determine whether the image has been altered in an illegitimate way, rendering it inadmissible.

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<sup>57</sup> It is important to realize the limited nature of the certification. The old process only certified that the photo given to the customer was a true copy of the photo (or film negative) held in the USGS/EROS archives. A photo conceivably might have been tainted before it was received by USGS/EROS, or it might have been modified after leaving USGS/EROS. The certification made such modification more difficult, but it did not completely eliminate the possibility. The digital certification process does the same, and in fact, provides more security for litigation processes.

<sup>58</sup> The data suppliers should be able to certify that proper, accepted digital imagery processing techniques were employed and that the satellite images were produced by the data processor in a routine way. FED. R. EVID. 406; *See also* Powell, *supra* note 35, at 585.

### *C. Evaluation*

Some specific evidentiary rules could have an impact on the admissibility of digital data that has been provided by – and even certified by – USGS/EROS, but none of them pose significant problems to the use of such data in court. Nor do they suggest that there are problems with the new certification process.

#### 1. Best Evidence Rule

The Federal Rules of Evidence 1002, generally referred to as the “best evidence rule,” requires the proponent, in order to prove the content of a writing, photograph, etc., to provide the original writing, photograph, etc.<sup>59</sup> It can be argued that a digital photograph will qualify as an original under Rule 1002 since an original includes the negative and any printout made from it,<sup>60</sup> and a print made from a digital photograph is essentially the same as one developed from a film camera. However, considering the possibility that a digital printout would not constitute an original under the Federal Rules of Evidence, Rule 1003 allows the admission of a duplicate unless “1) a genuine question is raised as to the authenticity of the original, or 2) in the circumstances it would be unfair to admit the duplicate in lieu of the original.”<sup>61</sup>

#### 2. Silent Witness Theory

A digital photograph can also be offered into evidence as substantive evidence under the “silent witness theory.” If this approach is used, the proponent will most likely be required to offer evidence of the process used to capture, store, and produce the image, and that the process produced an accurate result.<sup>62</sup> In

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<sup>59</sup> FED. R. EVID. 1002.

<sup>60</sup> FED. R. EVID. 1001(3).

<sup>61</sup> FED. R. EVID. 1003. Another possibility of meeting the requirements of Rule 1002 would be to consider digital photographs as data, which, according to Rule 1001(3), would allow “any printout or other output readable by sight, shown to reflect the data accurately” to qualify as an original. FED. R. EVID. 1001(3). Therefore, litigants using USGS/EROS data should not encounter any problems in meeting the “best evidence rule” requirements when submitting their exhibits into evidence.

<sup>62</sup> FED. R. EVID. 901(b)(9).

addition, it may be necessary to establish a detailed chain of custody, which would include

- 1) proving the accuracy and reliability of the data
- 2) proving the accuracy of the data as it was entered into the computer
- 3) showing the reliability and capability of the computer hardware/software
- 4) illustrating the process used for the computer graphics
- 5) and proving the reliability of the final product

The USGS/EROS certification of digital data will make it much easier for proponents of exhibits prepared from digital data to meet these requirements.

### 3. Hearsay Exception

When demonstrative evidence is offered for the truth of the matter asserted, as opposed to illustrate or clarify other evidence, there is the possibility of a hearsay objection. The proponent of an exhibit prepared from USGS/EROS data should be able to overcome this objection by showing that the digital data are business records, and therefore not excluded by the hearsay rule. Federal Rule of Evidence 803(6) allows records of regularly conducted activity to be admitted into evidence regardless of the hearsay rule if the

- 1) record was made in the regular course of business
  - 2) record was made at or near the time of the act, condition, or event
  - 3) custodian of the record or other qualified witness testifies to the record's identity and mode of preparation, and
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- 4) sources of information and method and time of preparation were such as to indicate the record's trustworthiness.<sup>63</sup>

Records kept in the ordinary course of business include any "memorandum, report, record, or data compilation."<sup>64</sup> These records are not kept for purposes of litigation, but are relied upon by government, business, and science professionals. As such, the data from USGS/EROS should easily survive a hearsay objection.

## V. CONCLUSION

Digital data can be captured and stored in such a way that they may be used to produce exhibits that are admissible into evidence at judicial proceedings. The new certification process at USGS/EROS will permit such use of digital data because the data, when they leave the USGS/EROS facility, have been adequately preserved when considering traditional, common law authentication factors. Moreover, because of the product number assigned to each order, it will be easy to uncover any illegitimate or unfair alteration. If digital data has been altered for a legitimate reason, such as visibility, the proponent should be able to explain the procedures and permit the opposing party to re-create the exhibit, relying upon the USGS/EROS order number and other legitimate post-production modifications. In such cases, the digital certification process will greatly facilitate admissibility.

In order to confirm that this new certification process will satisfy the needs of litigants, the authors of this paper contacted four judges: one state Supreme Court justice, one state Appellate Court judge, one federal Circuit Court judge, and one Federal District Court judge. All four of the judges had experience

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<sup>63</sup> FED. R. EVID. 803(6).

<sup>64</sup> FED. R. EVID. 803(6). The court in *United States v. Sanders*, while ruling on a hearsay objection, concluded that "computer business records are admissible if 1) kept pursuant to a routine procedure designed to assure their accuracy, 2) created for motives that tend to assure accuracy, and 3) not themselves mere accumulation of hearsay." *United States v. Sanders*, 749 F.2d 195, 198 (1984).

at both the trial and appellate court levels. While judges do not usually give advisory opinions,<sup>65</sup> these four all agreed that, if the process were properly implemented, it should be possible to make admissible exhibits from the certified data provided by USGS/EROS.

The new certification process will require some minor changes in procedures at USGS/EROS, but the changes are not burdensome, and will almost certainly take less time to comply with than did the old photo certification process. Most importantly, exhibits prepared from USGS/EROS digital data, when properly handled by litigants and their attorneys, should be admissible in court for evidentiary purposes. This new certification process should be emulated by other agencies and organizations that handle digital data.

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<sup>65</sup> The letter soliciting judicial input explained: "Essentially, we are asking you to look at this plan and determine whether you agree that, if proper procedures are followed, it will result in admissible exhibits. This is strictly an internal USGS matter, and your thoughts will not be disseminated to the public, used in court, or otherwise considered as a judicial ruling."



# THE EFFECT OF THE LIABILITY CONVENTION ON NATIONAL SPACE LEGISLATION

*Susan Trepczynski\**

## I. INTRODUCTION

Space activities are subject to both international and national law. Under international law, responsibility and liability for space activities falls upon States, regardless of whether the State participated, directly or indirectly, in the activity. National law supplies rules and regulations for space activities, but must operate within the framework established by the relevant international laws. Consequently, when developing national space law, States must take their international responsibilities and potential liabilities into account.

One issue that merits consideration is how liability imposed on States by international law impacts national space legislation. Particularly important in light of increasing private and commercial space activities, is whether the liability provisions of international space law negatively impact attempts to encourage commercialization and privatization of space activities through national legislation.

In exploring the effect of international liability on national space legislation, this paper provides a brief overview of relevant treaty provisions, followed by a discussion of the U.S. and Australian national space laws. Finally, an analysis of the interplay between international obligations and national law attempts to determine whether or not international liability provisions inhibit national attempts to advance privatization and commercialization of space activities.

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## II. STATE LIABILITY UNDER INTERNATIONAL SPACE LAW

Five multilateral treaties form the corpus of international space law.<sup>1</sup> These treaties are supplemented by declarations and legal principles,<sup>2</sup> as well as U.N. Resolutions.<sup>3</sup> The most important of these documents with respect to State liability are the Outer Space Treaty (OST) and Liability Convention.

### A. *The Outer Space Treaty*

The OST, the foundational international space law document, addresses State liability in two provisions – Articles VI and VII.

While Article VI does not directly discuss State liability, it establishes that States “shall bear international responsibility for *national activities* in outer space . . . whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities

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<sup>1</sup> 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 (entered into force Oct. 10, 1967) [hereinafter OST]; 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, 672 U.N.T.S. 119 [hereinafter Rescue Agreement]; Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762 [hereinafter Liability Convention]; Convention on Registration of Objects Launched into Outer Space, Jan. 14 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter Registration Convention]; and Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 18, 1979, 18 ILM 1434, 1363 UNTS 3 [hereinafter Moon Agreement].

<sup>2</sup> Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, G.A. Res. 1962, U.N. GAOR, 18th Sess., Supp. No. 15, U.N. Doc. A/5515 (1964); Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, G.A. Res. 37/92, U.N. Doc. A/RES/37/92 at 98 (1982); The Principles Relating to Remote Sensing of the Earth from Outer Space, G.A. Res. 41/65, U.N. Doc. A/RES/41/65 at 115 (Dec. 3, 1986); The Principles Relevant to the Use of Nuclear Power Sources in Outer Space, GA Res. 47/68, U.N. Doc. A/Res/47/68 at 88 (1992); The 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, U.N. Doc. A/AC.105/572/Rev. 1 (1996).

<sup>3</sup> See United Nations Office for Outer Space Affairs, *Index of Online General Assembly Resolutions Relating to Outer Space*, <http://www.unoosa.org/oosa/en/SpaceLaw/gares/index.html> (listing General Assembly Resolutions relating to space).

are carried out in conformity with” the OST.<sup>4</sup> State responsibility for the space activities of private entities also makes States liable for these activities.<sup>5</sup> Article VI further requires the “appropriate State” to provide “authorization and continuing supervision” of the space activities of its non-governmental entities. Because authorization and supervision are specific treaty obligations, a State is liable if a breach causes damage to another State.<sup>6</sup>

The international State liability regime established by Article VII links liability with launching State status. A State becomes a launching State in four ways: by launching an object into space; by procuring the launch of an object into space; if its territory is used for a launch; or if its facilities are used for a launch.<sup>7</sup> A State fitting into any of these categories is “internationally liable for damages . . . [caused] by [the launched] object or its component parts on the Earth, in air space or in outer space.”<sup>8</sup>

The significance of these treaty provisions is twofold. First, States are liable for all national activities in space, regardless of

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<sup>4</sup> OST, *supra* note 1, at art. VI [emphasis added]; *see also* BIN CHENG, *STUDIES IN INTERNATIONAL SPACE LAW* 607 (Oxford: Clarendon Press, 1997) (noting “[c]ontracting States . . . bear international responsibility for launchings that qualify as being ‘national’, whether carried on by themselves or by non-governmental entities”).

<sup>5</sup> *See* Julio Barboza, *Sine Delicto (Causal) Liability and Responsibility for Wrongful Acts in International Law*, in *INTERNATIONAL LAW ON THE EVE OF THE TWENTY-FIRST CENTURY: VIEWS FROM THE INTERNATIONAL LAW COMMISSION* 317-319 (New York: United Nations, 1997) (pointing out that in all official UN languages besides English “liability” and “responsibility” have the same meaning, and “‘responsibility’ and ‘liability’ are used interchangeably”); BRUCE A. HURWITZ, *STATE LIABILITY FOR OUTER SPACE ACTIVITIES IN ACCORDANCE WITH THE 1972 CONVENTION ON INTERNATIONAL LIABILITY FOR DAMAGE CAUSED BY SPACE OBJECTS* 22 (Netherlands: Kluwer, 1992) (noting State responsibility for national activities leads to liability for any private activities that would make it a launching State).

<sup>6</sup> *See e.g.* HENRI A. WASSENBERGH, *PRINCIPLES OF OUTER SPACE LAW IN HINDSIGHT* 30 (Netherlands: Kluwer, 1991).

<sup>7</sup> OST, *supra* note 1, at art. VII. Due to the broad scope of State responsibility in Article VI, “[c]ontracting States . . . bear international responsibility for launchings that qualify as being ‘national’, whether carried on by themselves or by non-governmental entities.” CHENG, *supra* note 4, at 607.

<sup>8</sup> OST, *supra* note 1, at art. VII. For any launch, more than one State could be a launching State (*e.g.* one State could procure a launch taking place from the territory of another), in which case liability is shared among all launching States. CHENG, *supra* note 4, at 637 (discussing multiple launching States).

whether there is actual State involvement.<sup>9</sup> Second, linking liability and launching State status makes launching States permanently liable for space objects, even if they have no control over a particular space object.<sup>10</sup>

### B. *The Liability Convention*

The Liability Convention elaborates upon OST Article VII.<sup>11</sup> The launching State basis for liability is maintained by the Liability Convention, which further defines and sets out the basic rules of that liability.<sup>12</sup>

Damage caused by a space object is a prerequisite to State liability.<sup>13</sup> Article I(a) establishes State liability for both personal and property damage, though the scope of each type of damage is unclear.<sup>14</sup> Article I(a) further defines “space object” to include “component parts of a space object as well as its launch vehicle and parts thereof.”

Unlike the OST, the Liability Convention differentiates between absolute and fault-based liability, depending on where the damage occurred. If a space object causes damage on the Earth’s surface or to an aircraft in flight, the launching State is

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<sup>9</sup> See generally CHENG, *supra* note 4, at 644 (stating that as a consequence of State responsibility and liability “States have a critical interest in regulating, as well as, under the [OST], a duty to control and supervise, private national space activities in order to ensure that these activities conform to their [treaty] obligations”).

<sup>10</sup> *Id.* at 239 (pointing out a State “may be held responsible for activities in extraterrestrial space over which it has no jurisdiction recognized by the treaty, and liable for any damages resulting therefrom”).

<sup>11</sup> See Liability Convention, *supra* note 1, at preamble (“[r]ecognizing the need to elaborate effective international rules and procedures concerning liability for damage causes by space objects”); CARL Q. CHRISTOL, *SPACE LAW: PAST, PRESENT, AND FUTURE* 216 (Netherlands: Kluwer, 1991); I. H. PH. DIEDERIKS-VERSCHOOR, *AN INTRODUCTION TO SPACE LAW* 26 (Netherlands: Kluwer, 1993).

<sup>12</sup> Liability Convention, *supra* note 1, at art. II. Article I(c) defines “launching State” in the same manner as the OST, but Article I(b) clarifies “[t]he term ‘launching’ includes attempted launching.” *Id.* at art. I.

<sup>13</sup> *Id.* at arts. II, III.

<sup>14</sup> Commentators differ as to whether indirect damages are recoverable. See HURWITZ, *supra* note 5, at 13-15 (arguing indirect damages are included, but recognizing publicists disagree on the issue); VERSCHOOR, *AN INTRODUCTION TO SPACE LAW*, *supra* note 11, at 35 (arguing only direct damages are recoverable); CHRISTOL, *supra* note 11, at 218-19 (advocating using a causal link to determine recoverable damages).

absolutely liable.<sup>15</sup> If a space object damages another space object “elsewhere than on the surface of the Earth,” the launching State is liable only if at fault.<sup>16</sup> The Liability Convention provides for joint and several liability between multiple launching States,<sup>17</sup> and opens the door to apportionment agreements between joint launching States, effectively allowing a launching State to contract out of liability, at least with respect to joint launching States.<sup>18</sup> The Liability Convention is inapplicable to damage caused to nationals of the launching State<sup>19</sup> and to foreign nationals participating in the launch or operation of the space object.<sup>20</sup>

The remainder of the Liability Convention addresses procedures for presenting claims,<sup>21</sup> the measure and payment of damages,<sup>22</sup> and the possibility of, and procedures for, setting up a Claims Commission to decide claims not settled through diplomatic channels.<sup>23</sup> These provisions do not directly address substantive liabilities of the State, are not of particular importance to the analysis of how international obligations influence national legislation, and will not be discussed further.

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<sup>15</sup> Liability Convention, *supra* note 1, at art. II. A State can be exonerated from absolute liability under certain circumstances, such as gross negligence of the claimant State. *Id.* at art. VI.

<sup>16</sup> *Id.* at art. III.

<sup>17</sup> *Id.* at art. IV; see CHENG, *supra* note 4, at 637-38 (discussing liability among multiple launching States).

<sup>18</sup> Liability Convention, *supra* note 1, at art. V(2) (stating “participants in a joint launching may conclude agreements regarding the apportioning among themselves of the financial obligation in respect of which they are jointly and severally liable,” but the agreement cannot “prejudice the right of a State sustaining damage to seek the entire compensation due under this Convention from any or all of the launching States which are jointly or severally liable”).

<sup>19</sup> *Id.* at art. VII(a).

<sup>20</sup> *Id.* at art. VII(b).

<sup>21</sup> *Id.* at arts. VII-XI.

<sup>22</sup> *Id.* at arts. XII-XIII.

<sup>23</sup> *Id.* at arts. XIV-XX. While the Claims Commission can be compulsory, its decisions are not binding unless the Parties agree, limiting its impact on a dispute. See CHENG, *supra* note 4, at 614-15.

## III. NATIONAL LEGISLATION DIRECTED AT SPACE ACTIVITIES

While most States have not enacted space-specific national legislation, many space-faring States do have such laws.<sup>24</sup> For the most part, domestic space legislation is not extensive, often covering only a few pages.<sup>25</sup> The U.S., however, has enacted a significant body of national legislation, supplemented by rules and regulations.<sup>26</sup>

A. *The United States*

The Commercial Space Launch Activities Act (CSLA)<sup>27</sup> and its associated regulations (CSLR),<sup>28</sup> form the primary body of national law addressing commercial launch activities. This legislation includes several provisions likely prompted by considerations of State responsibility and liability under international law.

## 1. Commercial Space Launch Activities Act

Several CSLA provisions ensure the U.S. does not bear the entire burden of liability in the event a space object (for which the U.S. is the launching State) causes damage to third parties. The relevant Congressional findings state the U.S. should regulate commercial launches “only to the extent necessary . . . to ensure compliance with international obligations of the United States and to protect the public health and safety, safety of property, and national security and foreign policy interests of

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<sup>24</sup> See United Nations Office for Outer Space Affairs, *National Space Law Database*, <http://www.unoosa.org/oosa/en/SpaceLaw/national/index.html> (listing States with national space legislation, and providing copies of that legislation).

<sup>25</sup> *Id.*

<sup>26</sup> See generally Joanne Irene Gabrynowicz, *Space Law: Its Cold War Origins and Challenges in the Era of Globalization*, 37 SUFFOLK U. L. REV. 1041,1047-51 (2004) (providing an overview of U.S. space law); Patrick André Salin, *An Overview of US Commercial Space Legislation and Policies – Present and Future*, 27 AIR & SPACE L. 209 (2002) (discussing U.S. domestic legislation aimed at commercial activities).

<sup>27</sup> Commercial Space Launch Activities Act, 49 U.S.C. §§ 70101-70305 (2006) (commonly known, prior to recent amendments, as the Commercial Space Launch Act of 1984) [CSLA].

<sup>28</sup> 14 C.F.R. §§ 400-460.53 (2006) [CSLR].

the United States.”<sup>29</sup> Thus, international State liability appears to be a primary consideration in determining the scope of domestic commercial launch regulations.

U.S. law requires a license be obtained before undertaking various launch-related activities; activities which are essentially coextensive with the international law definition of a launching State. Under Section 70104 a license is required: (1) to launch a vehicle from or reenter a vehicle to U.S. territory, or to operate a launch site in the U.S.; (2) for a U.S. citizen to launch or reenter a vehicle outside U.S. territory, or to operate a launch site outside U.S. territory; (3) for a U.S. citizen to launch or reenter a vehicle, or to operate a launch site from territory not controlled by any State, unless the U.S. has an agreement with a foreign government under which the foreign government has jurisdiction and control over such activities; or (4) for a U.S. citizen to launch or reenter a vehicle, or to operate a launch site in the territory of a foreign country, if the U.S. has an agreement with that country giving the U.S. jurisdiction over such activities.<sup>30</sup> These provisions track neatly with the international space law definition of a launching State suggesting a primary consideration of the licensing scheme is to make sure the U.S. is aware of, and maintains control over, all activities that could lead to its international liability.

Holders of launch licenses are required to procure sufficient liability insurance to cover the “maximum probable loss” arising from claims brought by third parties or the U.S. government.<sup>31</sup> With respect to third party claims,<sup>32</sup> regardless of what the maximum probable loss is determined to be, licensees are not required to obtain insurance for more than \$500,000,000 or “the maximum liability insurance available on the world market at reasonable cost” (if that cost is less than \$500,000,000) for each

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<sup>29</sup> CSLA, *supra* note 27, § 70101(a)(7) [emphasis added].

<sup>30</sup> *Id.* § 70104(a). The definition of a U.S. citizen is provided at § 70102(1).

<sup>31</sup> *Id.* § 70112(a)(1).

<sup>32</sup> “Third party” is broadly defined, including any person except the U.S. government, government contractors involved in launch or reentry services, the licensee, the licensee’s contractors, subcontractors, or customers (and the customer’s contractors and subcontractors) involved in launch or reentry services, and the crew of, or participants in the flight. *Id.* § 70102(21).

launch or reentry.<sup>33</sup> The purpose of the insurance requirement is to protect the U.S. government, “to the extent of [its] potential liability for involvement in launch services or reentry services, at no cost to the Government.”<sup>34</sup> While obtaining insurance would undoubtedly be required of licensees in the absence of launching State liability, this last provision is likely a response to launching State liability, since in many private launchings government involvement would not exist if not for internationally presumed ‘involvement’ based on launching State status.

The CSLA prohibits individual states from adopting any inconsistent “law, regulation, standard or order,” making subjects it addresses federal matters.<sup>35</sup> Although there are numerous reasons to subject launch activities to federal rather than state law, taking another approach could subject the U.S. to launching State liability without its knowledge and may be a violation of its duty of authorization and supervision under OST Article VI.<sup>36</sup> The CSLA must be carried out in a manner consistent with obligations assumed by the U.S. in treaties, conventions or agreements with other States, recognition that U.S. space policy must function within international law boundaries.<sup>37</sup>

## 2. Commercial Space Launch Regulations

The CSLR, administered through the Office of Commercial Space Transportation,<sup>38</sup> implement the provisions of the CSLA.<sup>39</sup> The basis for the Regulations is the CSLA, as well as “applicable

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<sup>33</sup> *Id.* § 70112(a)(3). If third party claims exceed the liability policy limits, the government may, subject to certain conditions, pay the residual of claims against the licensee. *Id.* § 70113. Such payments may or may not be required by launching State obligations under international law, depending upon whether, *inter alia*, the damage was caused by a space object.

<sup>34</sup> *Id.* § 70112(a)(4) [emphasis added].

<sup>35</sup> *Id.* § 70117(c).

<sup>36</sup> See generally NATHAN C. GOLDMAN, AMERICAN SPACE LAW: INTERNATIONAL AND DOMESTIC 142-44 (San Diego: Univelt, 1996) (discussing scope of federal preemption in U.S. space law field).

<sup>37</sup> CSLA, *supra* note 27, § 70117(e).

<sup>38</sup> CSLR, *supra* note 28, § 401.1.

<sup>39</sup> *Id.* § 404.1.

treaties and international agreements to which the United States is party.”<sup>40</sup>

Licensees are required to allow monitoring of activities by federal officials, whether or not those activities are the subject of the license.<sup>41</sup> In this way, not only is the government aware of launching activities subject to the license, but it is also provided with the means to continuously authorize and supervise space-related activities of private entities as required by OST Article VI.<sup>42</sup> The CSLR provide for license modification, if consistent with the CSLA, and suspension or revocation if license conditions are not met.<sup>43</sup> In addition, civil penalties are authorized for violation of the CSLA, any regulations, or any terms and conditions of the license.<sup>44</sup>

Section 413.3 contains requirements regarding who must obtain a license, covering all bases under which the U.S. would be considered a launching State. Its provisions also ensure “national activities” are covered, allowing the U.S. to meet its international duty of authorization.<sup>45</sup> Another provision designed to help the U.S. meet its international obligation of authorization and continuing supervision is Section 415.13, which gives the FAA the exclusive right to transfer a launch license.<sup>46</sup> In order to qualify for a transfer license, the transferee must meet all license requirements.<sup>47</sup>

The U.S. licensing process involves a policy approval, without which a license will not be granted.<sup>48</sup> If “the FAA determines that a proposed launch would jeopardize . . . international

<sup>40</sup> *Id.* § 400.1.

<sup>41</sup> *Id.* § 405.1.

<sup>42</sup> The CSLR make the licensee “responsible for the continuing accuracy of representations contained in its application for the entire term of the license,” requiring an application for modification of license if material representations change. *Id.* § 415.73.

<sup>43</sup> *Id.* § 405.3.

<sup>44</sup> *Id.* § 406.9.

<sup>45</sup> A license issued by the government can be considered “authorization” for that activity by the government, as without the license, the activity could not legally be carried out. *Id.* § 413.3 (describing “[w]ho *must* obtain a license”) [footnote emphasis added].

<sup>46</sup> *Id.* § 415.13.

<sup>47</sup> *Id.* § 415.13(b).

<sup>48</sup> *Id.* § 415.21. Subsequent sections contain additional requirements for the policy approval process. *Id.* §§ 415.23 – 415.27.

obligations of the United States,” the approval will not be granted and the license will not issue.<sup>49</sup> Items relevant to international State liability considered during the approval process are foreign ownership interests, flight specifics including launch site and potential ground impact areas, and information on orbits and estimated orbital lifetimes.<sup>50</sup> The U.S. thereby makes international space law obligations a factor in the licensing process, and any policy concerns about the relationship between those obligations and the prospective launch are grounds to deny a license.

The licensing process also includes a safety review.<sup>51</sup> Considerations relevant to potential international liability for launch activities taken into account in this process include a determination of the flight risk,<sup>52</sup> a “hazard identification and risk assessment,”<sup>53</sup> a review of in-orbit safety considerations,<sup>54</sup> and a review of the applicant’s accident investigation plan.<sup>55</sup>

An additional license condition is a payload review.<sup>56</sup> In order to qualify for a license, the FAA must determine, among other things, “whether [the payload’s] launch would jeopardize . . . international obligations of the United States.”<sup>57</sup>

Finally, licensees must provide all information necessary for U.S. registration obligations pursuant to Registration Convention Article IV.<sup>58</sup> The connection between registration and launching State liability arises because only a launching State may register a space object.<sup>59</sup> Therefore, the international pre-

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<sup>49</sup> *Id.* § 415.21.

<sup>50</sup> *Id.* § 415.25.

<sup>51</sup> *Id.* § 415.31.

<sup>52</sup> *Id.* § 415.35. This regulation includes calculations to determine whether flight risks are acceptable, based on the projected number of casualties in the event of a mishap. *Id.* § 415.35(a).

<sup>53</sup> *Id.* § 415.35(b).

<sup>54</sup> *Id.* § 415.39.

<sup>55</sup> *Id.* § 415.41.

<sup>56</sup> *Id.* § 415.51. Subsequent sections contain additional payload review requirements. *Id.* §§ 415.53 – 415.63.

<sup>57</sup> *Id.* § 415.51.

<sup>58</sup> *Id.* § 415.81.

<sup>59</sup> Registration Convention, *supra* note 1, at art. II(1) (stating “the launching State shall register the space object”). The Registration Convention defines “launching State” in the same way as the OST and Liability Convention. *Id.* at art. I(a).

sumption is, if the U.S. registered a space object pursuant to the Registration Convention, it is the launching State of that object and liable for any damage caused by that object.

### *B. Australia*

Like the U.S., Australia has enacted national space legislation and regulations. The primary space-specific legislation is the Space Activities Act of 1998 (1998 Act),<sup>60</sup> followed in 2001 by the Space Activities Regulations (2001 Regulations).<sup>61</sup> Both the 1998 Act and the 2001 Regulations contain provisions likely included to address launching State liability and State responsibility for national space activities under international law.

#### 1. Space Activities Act of 1998

The objectives of the 1998 Act demonstrate the primary concerns of the Act are to implement international obligations and enact national laws that operate within the scope of those obligations.<sup>62</sup> The objectives include establishing “a system for the regulation of space activities carried on either from Australia or by Australian nationals outside Australia;”<sup>63</sup> basically covering any activities for which Australia would be a launching State.

The extent to which Australia’s national laws are based on international obligations is demonstrated in the definitions section, which defines several terms according to their international space law definition.<sup>64</sup> For example, “damage,” “fault,” “gross negligence,” and “launching State,” have the same meaning as in the Liability Convention.<sup>65</sup> Interestingly the 1998 Act departs from international definitions in a few significant instances. Although no definitive air/space boundary exists in

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<sup>60</sup> Space Activities Act of 1998, Acts of Parliament of the Commonwealth of Australia No. 23 (assented to Dec. 21, 1998) [hereinafter 1998 Act].

<sup>61</sup> Space Activities Regulations 2001, Statutory Rules 2001 No.186 [hereinafter 2001 Regulations].

<sup>62</sup> 1998 Act, *supra* note 60, § 3.

<sup>63</sup> *Id.* § 3(a).

<sup>64</sup> *Id.* § 8.

<sup>65</sup> *Id.*

international law, Australia has established a national definition of that boundary by defining both “launch” and “space object” (terms not defined in international law) based upon passing the 100 km altitude mark.<sup>66</sup> By defining terms that are undefined in international space law, and basing the definitions of those terms on a boundary line that does not exist under international law, Australia might have created potential conflicts between its national laws and international treaty obligations.<sup>67</sup>

Australia has three types of licenses – space licenses, launch permits, and overseas launch certificates.<sup>68</sup> A space license applies to the operation of Australian launch sites and a launch permit applies to “the launch of a particular space object, or a particular series of launches of space objects,”<sup>69</sup> by any person, from Australian territory.<sup>70</sup> An overseas launch certificate is required for launches outside Australia, for which an Australian national is responsible.<sup>71</sup> It is possible a space license and a launch permit may be required for any given launch.<sup>72</sup> As with the U.S., Australia requires space licenses, launch permits, or overseas launch certificates in any circumstances that qualify Australia as a launching State.<sup>73</sup> By requiring a permit, Australia can control its exposure to liability, as well as authorize and

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<sup>66</sup> *Id.* (stating “launch a space object means launch the object into an area beyond the distance of 100 km above mean sea level, or attempt to do so” and “space object means a thing consisting of: (a) a launch vehicle; and (b) a payload (if any) that the launch vehicle is to carry into or back from an area beyond the distance of 100 km above mean sea level or any part of such a thing”). The definition of “launch vehicle” also references the 100 km distance. *Id.*

<sup>67</sup> If an Australian “craft,” not an aircraft, was operating below 100 km (was intended to operate below that line) and caused damage (within the meaning of the Liability Convention) to another State, a dispute could arise between the States regarding whether the Liability Convention applied, the craft was a space object, and the craft was in space. Because international space conventions do not set a boundary, States are presumably free to decide the matter for themselves. Given these circumstances, a dispute would not necessarily be easily settled.

<sup>68</sup> 1998 Act, *supra* note 60, §§ 11-15. There are also requirements pertaining to the return to Australia of Australian-launched objects. *Id.* § 13. There are separate requirements for the return to Australia of overseas-launched objects. *Id.* § 24.

<sup>69</sup> *Id.* § 26(1). A launch permit can also authorize the return of particular space objects to specified locations in Australia. *Id.* § 26(2).

<sup>70</sup> *Id.* §§ 11, 15.

<sup>71</sup> *Id.* § 12.

<sup>72</sup> *Id.* § 26(3)(a).

<sup>73</sup> *Id.* §§ 11-15.

continuously supervise national activities as required by OST Article VI. In the event a launch takes place without the required permit, the 1998 Act provides for criminal sanctions.<sup>74</sup>

A space license “*may*”<sup>75</sup> be granted once numerous conditions are met, including a determination there is no reason, based on international obligations, the license should not be granted.<sup>76</sup> Furthermore, “standard space license conditions” include allowing officials access to the launch site, space object, and all requested information.<sup>77</sup> License transfers are permitted, but must be made by the appropriate official, and only if the transferee could have qualified for a license.<sup>78</sup> Finally, the government has the discretion to modify, revoke or suspend a license, or to subject it to an annual review.<sup>79</sup> These provisions ensure applicants understand at the outset that Australia maintains significant control over all launch activities.

Launch permits are also subject to numerous conditions.<sup>80</sup> Permits are effectively subject to conditions placed on space licenses because, in order to qualify for a launch permit, applicants must have a space license “covering the launch facility and the kind of launch vehicle concerned.”<sup>81</sup> Applicants must also meet “insurance/financial requirements”<sup>82</sup> (discussed below) and, as with a space license, there must be no reason, based on “international obligations” the permit should not issue.<sup>83</sup>

If a particular launch involves joint launching States, consideration may be given to “whether there is an agreement between Australia and that other country under which that coun-

<sup>74</sup> *Id.*

<sup>75</sup> *Id.* § 18 [emphasis added]. The use of the term “*may*” signifies there is no entitlement to a license, allowing Australia to avoid automatic authorization procedures, which may be insufficient to meet OST Article VI obligations.

<sup>76</sup> *Id.* § 18(e).

<sup>77</sup> *Id.* § 20.

<sup>78</sup> *Id.* § 22.

<sup>79</sup> *Id.* §§ 24-25A.

<sup>80</sup> *Id.* §§ 26-34.

<sup>81</sup> *Id.* § 26(3)(a). Furthermore, “[i]f the launch facility specified in a launch permit is in Australia, the permit has no effect during any period when the holder of the permit does not also hold a space licence . . . covering the facility and the kind of launch vehicle concerned.” *Id.* § 27.

<sup>82</sup> *Id.* § 26(3)(d).

<sup>83</sup> *Id.* § 26(3)(g).

try assumes any liability, and indemnifies Australia, for any damage that the space object or objects may cause; and the terms of that agreement” in deciding whether to issue a launch permit.<sup>84</sup> This provision was likely a reaction to two aspects of the Liability Convention. First, joint launching States are jointly and severally liable for damages caused to third States, meaning Australia could be fully liable for damages caused by a joint launching State, though it may have had no control over the object.<sup>85</sup> Secondly, damage caused by one joint launching State to nationals of another joint launching State is excluded from the scope of the Liability Convention in many circumstances.<sup>86</sup> Therefore, it makes sense for Australia to factor the existence of indemnity agreements into the launch permit approval process, because such agreements may be the only way of assuring compensation if it, or its nationals, suffer damages in a joint launch.

As with space licenses, launch permits are transferable, but only if the transferee could fulfill all requirements for the permit,<sup>87</sup> and if the transferee’s use will be limited to the scope of activities covered by the original permit.<sup>88</sup> Space licenses can be varied, transferred, suspended, or revoked at the discretion of the government.<sup>89</sup> Consequently, Australia retains control over launch activities taking place on its territory, allowing it to limit its exposure as a launching State.

Overseas launch certificates “may” be granted to Australian nationals after the necessary conditions are met.<sup>90</sup> Requiring Australian nationals to obtain overseas launch certificates is a

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<sup>84</sup> *Id.* § 26(4).

<sup>85</sup> Liability Convention, *supra* note 1, at arts. IV-V. Article V(2) permits joint launching States to conclude indemnification agreements between themselves, precisely the type of agreement the Australian legislation looks for in deciding whether to issue a launch permit.

<sup>86</sup> *Id.* at art. VII (excluding damage caused to nationals of the launching State and “[f]oreign nationals during such time as they are participating in the operation of that space object from the time of its launching or at any stage thereafter until its descent, or during such time as they are in the immediate vicinity of a planned launching or recovery area as the result of an invitation of that launching State”).

<sup>87</sup> 1998 Act, *supra* note 60, § 31(1).

<sup>88</sup> *Id.* §§ 31(2)-31(5).

<sup>89</sup> *Id.* §§ 33-34.

<sup>90</sup> *Id.* § 35.

response to obligations stemming from OST Article VI and the subsequent launching State status that attaches if an Australian national is responsible for an overseas launch.<sup>91</sup>

The conditions for obtaining overseas launch certificates include fulfilling the same insurance/financial requirements as domestic launch permit applicants,<sup>92</sup> a determination the launch is not unduly dangerous,<sup>93</sup> and a determination that granting the certificate will be in accordance with international obligations.<sup>94</sup> Also similar to domestic launch permits, the existence of indemnity agreements with other involved launching States, and the content of those agreements, can be considered in determining whether to grant a launch certificate.<sup>95</sup> The transfer of launch certificates is restricted in a manner similar to space licenses and launch permits,<sup>96</sup> and, like licenses and permits, certificates may be amended, suspended or revoked by the government.<sup>97</sup>

Insurance and financial requirements are applicable to launch permits and overseas launch certificates.<sup>98</sup> Launching State liability is mentioned in connection with the insurance provisions, which require holders of launch permits or overseas launch certificates to obtain insurance covering not only any liability the holder might incur, but also “any liability the Commonwealth might incur, under the Liability Convention or otherwise under international law.”<sup>99</sup> The amount of insurance that must be obtained is the lesser of \$750 million or the maximum probable loss.<sup>100</sup>

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<sup>91</sup> See CHENG, *supra* note 4, at 639 (noting States are liable for activities of their nationals that, if undertaken by the State, would qualify it as a launching State).

<sup>92</sup> 1998 Act, *supra* note 60, § 35(2)(a)(i). Unlike domestic launch permit requirements, it is possible for the Australian government to determine these financial requirements need not be satisfied. *Id.* § 35(2)(a)(ii).

<sup>93</sup> *Id.* § 35(2)(b).

<sup>94</sup> *Id.* § 35(2)(c).

<sup>95</sup> *Id.* § 35(3).

<sup>96</sup> *Id.* § 38.

<sup>97</sup> *Id.* §§ 40-41.

<sup>98</sup> *Id.* §§ 47-49.

<sup>99</sup> *Id.* §§ 48(1)-48(2).

<sup>100</sup> *Id.* § 48(3). The amounts may be changed by the regulations. *Id.*

A Launch Safety Officer is appointed to each licensed launch facility.<sup>101</sup> The duties of the Launch Safety Officer include ensuring compliance with the 1998 Act, the 2001 Regulations, and the terms of the license.<sup>102</sup> The inclusion of a Launch Safety Officer allows Australia to exercise continuing supervision over its national activities, as required by OST Article VI.

The 1998 Act address liability for damage caused by space objects,<sup>103</sup> covering all situations in which Australia would be the launching State.<sup>104</sup> While compensation to third parties is generally only payable in accordance with its provisions,<sup>105</sup> the 1998 Act “does not prevent Australia from complying with any obligation to pay compensation under the Liability Convention, or otherwise under international law,”<sup>106</sup> recognizing domestic legislation cannot erase international launching State liability. In fact, the 1998 Act essentially restates the substantive liability provisions of the Liability Convention.<sup>107</sup> The advantage of holding a valid launch permit or overseas launch certificate is that Australia will pay any amount due for a Liability Convention claim greater than the insured amount required by the launch permit or certificate.<sup>108</sup> Finally, the 1998 Act “also has the effect it would have if its operation were expressly confined to . . . giving effect to the UN Space Treaties.”<sup>109</sup>

## 2. Space Activities Regulations of 2001

The 2001 Regulations contain detailed provisions expanding on parts of the 1998 Act.<sup>110</sup> Examples include space license

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<sup>101</sup> *Id.* § 50. Division 8 is devoted to the powers and duties of the Launch Safety Officer. *Id.* § 50-58.

<sup>102</sup> *Id.* § 51.

<sup>103</sup> *Id.* §§ 63-75.

<sup>104</sup> *Id.* § 63. Section 63(3)(c) clarifies sections 63-75 apply regardless of whether the launch or return was authorized under the 1998 Act, which comports with Liability Convention provisions holding a launching State liable whether or not it authorized the activity creating Launching State status.

<sup>105</sup> *Id.* § 64(1).

<sup>106</sup> *Id.* § 64(2).

<sup>107</sup> *Id.* §§ 67-68.

<sup>108</sup> *Id.* § 74.

<sup>109</sup> *Id.* § 108(2)(a).

<sup>110</sup> 2001 Regulations, *supra* note 61.

conditions<sup>111</sup> and specifics that must be included in an application for a space license<sup>112</sup> or the transfer of a space license.<sup>113</sup> Under the 2001 Regulations, the financial standing and organizational structure of a space license applicant may be considered in the application review process.<sup>114</sup> The 2001 Regulations contain similar provisions with respect to launch permits<sup>115</sup> and overseas launch certificates.<sup>116</sup>

The 2001 Regulations invoke the Liability Convention with respect to exemption certificates.<sup>117</sup> The 1998 Act provides for exemptions allowing otherwise prohibited conduct to be issued, but references the Regulations as containing mandatory considerations for deciding whether to issue an exemption.<sup>118</sup> One such consideration is “the probability of the Commonwealth being exposed to liability, under the Liability Convention or otherwise under international law, for damage caused by the conduct.”<sup>119</sup>

Insurance and financial requirements are addressed in the 2001 Regulations.<sup>120</sup> Applicants for launch permits and overseas launch certificates must demonstrate “direct financial responsibility” for the launch<sup>121</sup> by providing evidence of “net assets sufficient to cover any liability the holder might incur for damage to third parties caused by the launch or return, or other evidence showing the holder is able to comply with any obligation to pay compensation for such damage.”<sup>122</sup> The Regulations also detail the components of maximum probable loss calculations, including the value of third party casualty and property loss, as well as environmental damage and economic loss.<sup>123</sup> If such damages are caused to another State, the Liability Convention

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<sup>111</sup> *Id.* § 2.04.

<sup>112</sup> *Id.* § 2.06.

<sup>113</sup> *Id.* § 2.08.

<sup>114</sup> *Id.* § 2.10.

<sup>115</sup> *Id.* §§ 3.01-3.12.

<sup>116</sup> *Id.* §§ 4.01-4.07.

<sup>117</sup> *Id.* § 6.01.

<sup>118</sup> 1998 Act, *supra* note 60, at § 46.

<sup>119</sup> 2001 Regulations, *supra* note 61, § 6.01(c).

<sup>120</sup> *Id.* §§ 7.01-7.03.

<sup>121</sup> *Id.* § 7.01(1).

<sup>122</sup> *Id.* § 7.01(2)(a).

<sup>123</sup> *Id.* § 7.02.

holds Australia liable as a launching State for at least the casualty and property losses.<sup>124</sup> Finally, the 2001 Regulations detail how the appropriate insurance coverage associated with overseas launch certificates is determined, basing it largely on an assessment of “the amount of liability to pay compensation that the Commonwealth might incur, under the Liability Convention,”<sup>125</sup> indicating the primary force behind the insurance requirement for overseas launch certificates is launching State liability.

#### IV. THE EFFECT OF INTERNATIONAL OBLIGATIONS ON NATIONAL LEGISLATION

##### A. *Do International Obligations Inhibit National Legislation?*

Before discussing the impact of international liability obligations on national legislation, it is important to briefly describe the nature of these obligations. While space treaty obligations are the original source of State liability and responsibility, thus allowing States to avoid their application by simply not becoming party to the treaties, these obligations are now acknowledged as being part of customary international law.<sup>126</sup> If OST Article VII is part of customary international law, the Liability Convention, an elaboration of Article VII, must also logically be regarded as part of customary international law, at least with respect to its substantive liability provisions.<sup>127</sup>

Regardless of the status of the treaty obligations themselves, other principles of customary international law essentially mimic the effect of certain treaty obligations. For example, a well-recognized principle of international law is that a State cannot allow its territory to be used to cause injury to another State.<sup>128</sup> Therefore, as long as a launch takes place from

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<sup>124</sup> See *supra* note 14 and accompanying text.

<sup>125</sup> 2001 Regulations, *supra* note 61, § 7.03(1)(a).

<sup>126</sup> See e.g. CHENG, *supra* note 4, at 175 (stating “[t]here is no doubt that a number of the treaty rules relating to outer space have become ‘customary’ international law” including OST Articles VI and VII).

<sup>127</sup> See *supra* note 11 and accompanying text.

<sup>128</sup> See *Trail Smelter Case (U.S. v. Can.)* 3 R.I.A.A. 1911 (1941) (finding “[a] State owes at all times a duty to protect other States against injurious acts by individuals

territory controlled by one State and causes damage in another State, the first State is liable under general principles of international law, whether or not it is party to any of the space treaties, and whether or not the treaty obligations themselves form part of customary international law.

Since, for the most part, the State responsibility and liability obligations of the space treaties have either become part of customary international law, or are mimicked by other sources of customary international law, any effect such obligations may have on national legislation must be accepted as part of the duty of a State to its global neighbors.<sup>129</sup>

The question then becomes whether these obligations negatively impact domestic space legislation, specifically the ability of such legislation to effectively promote private and/or commercial space activity within a given jurisdiction. The analysis of relevant provisions of the U.S. and Australian legislation shows international State responsibility and liability does factor into the content of national legislation. There is, however, a difference between acknowledging and following international obligations in national legislation and having the content of that legislation be negatively influenced by such obligations.

While many provisions of the U.S. and Australian legislation accord with international rules of State responsibility and liability, for the most part those provisions are also necessary from a national perspective. Regardless of international State

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from within its jurisdiction"); *Corfu Channel Case (United Kingdom v. Albania)*, Judgment of 9 April 1949, [1949] I.C.J. Rep. 4 at 22 (holding a State has a duty "not to allow knowingly its territory to be used for acts contrary to the rights of other States"); *Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion*, 1996 I.C.J. Rep. 241, at ¶ 29 (July 8) (stating "[t]he existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law"). The general acceptance of this duty is further demonstrated by its inclusion in various international agreements, such as those relating to the environment. *See e.g.*, Report of the United Nations Conference on Environment and Development, June 3-14, 1992, Rio Declaration on Environment and Development, princ. 2, U.N. Doc. A/CONF.151/5/Rev. 1(1992).

<sup>129</sup> It is unlikely any revision of the space treaties could do away with launching State liability, at least not with respect to the launch itself and the immediate aftermath (perhaps defined as the period before an object is deemed safely in orbit or, in the case of suborbital flights, until the flight is safely completed). *See supra* note 128 and accompanying text.

liability States would likely require licenses and liability insurance,<sup>130</sup> and these are the provisions of national space law most directly connected to and influenced by international State responsibility and liability.<sup>131</sup> Simply because licensing and insurance requirements are inextricably connected to the space industry due to its nature does not mean national legislation is unaffected by international space law. It also does not mean international law cannot be improved upon. In fact, revising certain international requirements would allow for corresponding changes in national legislation, opening the door to increased opportunities for national private and commercial space activities.

*B. Should International Liability Rules be Amended?*

Given many treaty rules at issue here have evolved into customary international law, the force of any amendment made to the OST or Liability Convention in this regard would be questionable. However, revision of certain provisions could be accomplished without altering the State liability that is part of customary international law, and would have a positive effect on private and commercial space activities.

The first area of international space law that needs amendment is the link between launching State status and liability. Today the rule is effectively 'once a launching State, always a launching State,' meaning a launching State is forever liable for any damage the object causes.<sup>132</sup> Basing liability on launching State status inhibits commercial activity because it forces States to maintain links to space objects, even if the object is removed from the jurisdiction of the State; for example, in

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<sup>130</sup> An analogy can be drawn to air law, which also contains requirements for licensing and insurance. For a general discussion of air law, see I.H. PH. DIEDERICKS-VERSCHOOR, *AN INTRODUCTION TO AIR LAW* (Netherlands: Kluwer, 2001).

<sup>131</sup> See Part III, above, discussing the effect of international law on national law, and revealing national law provisions most influenced by international requirements deal with either licensing or insurance.

<sup>132</sup> See, e.g. Henry R. Hertzfeld and Frans G. von der Dunk, *Symposium: Issues In Space Law: Bringing Space Law into the Commercial World: Property Rights without Sovereignty*, 6 *CHI. J. INT'L L.* 81, 89 (stating that "defining a liable entity based on the launch results in the consequence of once a liable state, always a liable state").

the case of on-orbit satellite transfers.<sup>133</sup> While it may be possible to procure an indemnity agreement each time a space object is sold to a foreign national, it remains to be seen what effect that agreement might have with respect to third party claims,<sup>134</sup> especially if the buyer and/or the buyer's State, are unwilling or unable to cover the costs of damage caused by the space object.

A fairly simple, straightforward solution to the linking of liability and launching State status, which would preserve the concept of State liability for space objects, is linking liability to nationality, based on which State has jurisdiction and control over the object.<sup>135</sup> This would allow the transfer of space objects to include the transfer of liability to the State of nationality of the transferee; a logical outcome, as only the transferee has the benefit of the space object, and should therefore bear any international responsibility associated with the benefit of that ownership.<sup>136</sup>

A second area for improvement is the basis and limits of liability. For damage caused on the ground, launching States

<sup>133</sup> See, e.g., *id.* (discussing difficulties created by the link between launching State and liability, and noting,

even after space hardware changes hands in outer space, the originally liable state(s) will, under the Liability Convention, remain so until the space object under consideration ceases to exist, even if the space hardware concerns a complete satellite (space object), which, after its sale in orbit, no longer remains under any control of the original launching State(s)).

*Id.*

<sup>134</sup> See *supra* note 18 (providing language from the Liability Convention). Based on the Liability Convention, as between a launching State and a state suffering damage, the launching State will always be liable in the first instance, and whatever it is able (or not able) to recover pursuant to indemnity agreements is irrelevant to that liability.

<sup>135</sup> See, e.g. CHENG, *supra* note 4, at 475-491 (discussing difficulties created by international space law, and suggesting that "what seems needed is serious consideration whether . . . especially since commercial and private activities in outer space have now fully taken off, it would not be best to revert to the well-established concept of nationality"); VERSCHOOR, AN INTRODUCTION TO AIR LAW, *supra* note 130, at 22-25 (discussing the use of nationality with respect to aircraft and ships).

<sup>136</sup> Of course this would necessitate changes in the Registration Convention, which only allows a launching State to register a space object, and does not contain provisions for transfer of registration. (Registration Convention, *supra* note 1, at art. I(c)). If nationality were used to create the basis of liability, it would make sense to require registration be in the name of the State of nationality, and to allow registration to be transferable if the space object is sold to a foreign national. See *generally* Convention on International Civil Aviation, arts. 17-12, 83bis, Dec. 7, 1944, 15 U.N.T.S. 295, ICAO Doc. 7300/8 (demonstrating use of nationality in air law).

face absolute liability with no limitation on amount.<sup>137</sup> The reasoning behind these liability rules is based upon the classification of space activities as ultra-hazardous.<sup>138</sup> However, the Liability Convention was concluded over 30 years ago when space activities were relatively new, and almost exclusively undertaken by States. Today space activities are increasingly undertaken by private entities for commercial reasons. While mishaps with launches and other space activities and objects do occur (as they do with aircraft and automobiles), the industry has matured to the point where absolute, unlimited liability based on the label of 'ultra-hazardous' no longer makes sense.<sup>139</sup> It is this basis of liability which drives insurance rates, in turn increasing the costs of space activities, particularly launches. If launching States were not faced with absolute, unlimited liability, the high insurance coverage mandated by national laws would be reduced, making entry into the space field less costly, and therefore more attractive, to increased numbers of private ventures.<sup>140</sup>

## V. CONCLUSION

State responsibility and liability under international space law undoubtedly influences the content of national space law. The most significant, and perhaps detrimental effects, seem to be related to the near-unbreakable (and today illogical) bond between the launching State and international liability, and the basis and unlimited nature of that liability. While launching State liability itself is firmly anchored in customary international law (whether based on space treaties or other sources), it

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<sup>137</sup> Liability Convention, *supra* note 1, at art. II.

<sup>138</sup> VERSCHOOR, AN INTRODUCTION TO SPACE LAW, *supra* note 11 at 33-34.

<sup>139</sup> See generally CHRISTOL, *supra* note 11 (noting "policy considerations . . . raise the question whether there should be an international limit on liability" and that "such limits have been established for international nuclear, maritime, and air transport activities," which have similarities to the risks involved in space activities).

<sup>140</sup> See generally GOLDMAN, *supra* note 36, at 150-52 (discussing types of insurance and applicability to space activities); VERSCHOOR, AN INTRODUCTION TO SPACE LAW, *supra* note 130, at 175-77 (discussing aviation insurance). Even though liability may be "limited" by "maximum probable loss" determinations for private entities, which allows insurance premiums to be set accordingly, limiting liability would lower premiums. A solution based on the aviation model could be effective.

is possible to reduce, even eliminate, these detrimental effects by making changes to the space treaties, while preserving the aspects of State liability that are rooted in customary international law. These changes would be beneficial to private and commercial enterprises, thereby aiding in the growth and development of the space industry.



# INTERNATIONAL AND U.S. NATIONAL LAWS AFFECTING COMMERCIAL SPACE TOURISM: HOW ITAR TIPS THE BALANCE STRUCK BETWEEN INTERNATIONAL LAW AND THE CSLAA

*Charles W. Stotler\**

## INTRODUCTION

### I. SUMMARY

With the historic dawn of space tourism, new terrain in the landscape of commercial space activity was discovered. A flurry of entrepreneurial space activity ensued. The importance of this activity with regard to the health and sustenance of the United States as a leading power in the global community has been recognized. U.S. National laws have been enacted to sustain America's successful competition in this burgeoning industry. Yet, as with other legislation reactive to threats to security and sovereignty, laws can impede liberty and constrain free enterprise as much as they can empower them. American policy must be inline with our most fundamental of human natures: compulsion for discovery—a want to know what is out there beyond the horizon.

This document presents a brief history of space tourism coupled with a detailed examination of the laws directly affecting the space tourism industry. It moves from the history of space tourism to an exposé of the pertinent treaties governing space law promulgated by the United Nations. Next, it examines the Commercial Space Launch Amendments Act and the International Traffic in Arms Regulations, ever mindful of the effects of these laws on the space tourism industry. In conclusion, it attempts rebut claims that domestic policies of the

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United States have been deleterious to the advancement of the commercial space industry, presenting a wider context in which to view the policies.

## II. A BRIEF HISTORY OF SPACE TOURISM

In April of 2001, Dennis Tito, a former NASA employee, became the first space tourist.<sup>1</sup> He was followed one year later by South African, Mark Shuttleworth, and by American Dr. Greg Olsen in October of 2005.<sup>2</sup> Each of these space flight participants paid a cool \$20,000,000 for a flight on board a Russian Soyuz rocket to the International Space Station.<sup>3</sup> Space Adventures Ltd., the only company currently offering orbital space flights, organized these trips.<sup>4</sup> For a mere \$15,000,000 more, space tourists can participate in a space walk.<sup>5</sup> For \$100,000,000, they can fly around the moon.<sup>6</sup> Space Adventures also offers clients a lower cost suborbital flight for \$102,000.<sup>7</sup> On 18 September 2006, Anousheh Ansari, sponsor of the Ansari X-Prize, became the world's first female space tourist.<sup>8</sup> Most recently, Hungarian Charles Simonyi returned from a \$25,000,000, 10 day visit to the International Space Station.<sup>9</sup> The cost of space flights is rising precipitously: Space Adventures now lists prices ranging from \$30-\$40 million for an orbital space flight.<sup>10</sup>

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<sup>1</sup> *Tourists Visit the International Space Station*, SPACE TODAY ONLINE, <http://www.spacetoday.org/Astronauts/SpaceTourists.html> (last visited Aug. 13, 2007).

<sup>2</sup> *Id.*

<sup>3</sup> Chris Conway, *Outer Space and the Profit Motive*, NEW YORK TIMES, Nov. 26, 2006, [http://www.nytimes.com/2006/11/26/weekinreview/26basics.html?\\_r=1&oref=slogin](http://www.nytimes.com/2006/11/26/weekinreview/26basics.html?_r=1&oref=slogin).

<sup>4</sup> Space Adventures, *Orbital Space Flight*, <http://72.29.31.40/index.cfm?fuseaction=orbital.welcome> (last visited Aug. 13, 2007).

<sup>5</sup> Conway, *supra* note 3.

<sup>6</sup> Space Adventures Ltd. has partnered with the Russians to send two space tourists around the moon. *Id.*

<sup>7</sup> Space Adventures, *Suborbital Space Flight*, <http://72.29.31.40/index.cfm?fuseaction=suborbital.welcome> (last visited Aug. 13, 2007).

<sup>8</sup> WIKIPEDIA, [http://en.wikipedia.org/wiki/Anousheh\\_Ansari](http://en.wikipedia.org/wiki/Anousheh_Ansari) (last visited Aug. 13, 2007).

<sup>9</sup> *Space tourist makes safe return*, BBC NEWS, Apr. 21, 2007, <http://news.bbc.co.uk/1/hi/sci/tech/6578835.stm>.

<sup>10</sup> Space Adventures, *Orbital Space Flight*, [http://72.29.31.40/index.cfm?fuseaction=orbital.Scheduled\\_ISS\\_Missions](http://72.29.31.40/index.cfm?fuseaction=orbital.Scheduled_ISS_Missions) (last visited Aug. 13, 2007).

Space Adventures, Ltd. isn't the only name making waves in the commercial space tourism industry. On 4 October 2004, financier Paul Allen and designer Burt Rutan garnished the Ansari X-Prize of \$10,000,000, when SpaceShipOne completed two suborbital space flights in five days.<sup>11</sup> The spaceship was ferried to an altitude of 46,000 feet by its carrier plane White Knight, before ascending to suborbital space.<sup>12</sup> In the wake of this success, Rutan has teamed with Sir Richard Branson, to form The Spaceship Company to build a fleet of commercial suborbital spaceships for Branson's Virgin Galactic.<sup>13</sup> Tickets will cost approximately \$200,000 and Virgin Galactic is already accepting reservations for the projected 2009-2010 flights.<sup>14</sup> They hope to send over 50,000 people to space over a ten year period.<sup>15</sup>

### III. STIMULATING THE COMMERCIAL SPACE INDUSTRY

In these most recent developments in space flight, it must be noted that a new rift has formed between East and West. The Russian space program is unabashedly subsidizing itself through tourism. They have increased their ticket price to \$21,000,000 and have still booked all seats for the next two years.<sup>16</sup> NASA has moved in the opposite direction, refusing to participate in space tourism.<sup>17</sup> Instead, the west has successfully embraced an old concept to stimulate innovation: the prize contest.<sup>18</sup>

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<sup>11</sup> Leonard David, *SpaceShipOne Wins \$10 Million Ansari X Prize in Historic 2nd Trip to Space*, SPACE.COM, Oct. 4, 2004, [http://www.space.com/missionlaunches/xprize2\\_success\\_041004.html](http://www.space.com/missionlaunches/xprize2_success_041004.html).

<sup>12</sup> *Id.*

<sup>13</sup> Leonard David, *Virgin Galactic details its space travel plans*, MSNBC.com, Nov. 10, 2006, <http://www.msnbc.msn.com/id/15654772/>.

<sup>14</sup> See Virgin Galactic: <http://www.virgingalactic.com/> (last visited July 29, 2007).

<sup>15</sup> *Virgin Galactic details its space travel plans*, *supra* note 13.

<sup>16</sup> Chris Conway, *Russia, Outer Space and the Profit Motive*, NEW YORK TIMES, Nov. 26, 2006, [http://www.nytimes.com/2006/11/26/weekinreview/26basics.html?\\_r=1&oref=slogin](http://www.nytimes.com/2006/11/26/weekinreview/26basics.html?_r=1&oref=slogin).

<sup>17</sup> Allard Beutel, spokesman for NASA, stated that space tourism "[is] not our charter; it's not our mandate; it's not what we do. Our job is space exploration and science and R&D." Conway, *supra* note 16.

<sup>18</sup> For a thorough discussion of the prize contests and its effects on the aviation industry and prospects for the space industry, see Spencer H. Bromberg, Comment, *Public Space Travel-2005: A Legal Odyssey into the Current Regulatory Environment for*

In 1919, Lord Northcliffe's *Daily Mail* prize of £10,000 was awarded by then British Secretary of State Winston Churchill to John Alcock and Arthur Whitten Brown after they completed the first non-stop flight across the Atlantic.<sup>19</sup> Eight years later, the Orteig Prize of \$25,000 spurred Charles Lindbergh's first ever solo flight across the Atlantic in his plane the Spirit of St. Louis.<sup>20</sup> The Ansari X-Prize, mentioned above, followed in this tradition. The most recent and most ambitious prize contest is the America's Space Prize, offered by Nevada millionaire, Robert Bigelow.<sup>21</sup> With cowboy cavalier, Bigelow offers \$50,000,000 to the first United States domiciliary who launches a vehicle, two times within 60 days, capable of carrying at least 5 passenger, docking with his orbital expandable space habitat, and remaining there for six months, at an altitude of 250 miles, all before 10 January 2010.<sup>22</sup>

The United States government is realizing the power of the prize contest. The Commercial Space Achievement Award consists of a medal, of a design to be determined by the Secretary of Commerce,<sup>23</sup> to be awarded to an individual or corporation that substantially advances space technology and applications directly related to commercial space activity.<sup>24</sup> A cash prize may be included in the award.<sup>25</sup> The Government is also hoping to invigorate commercial space endeavors through a policy of purchasing space goods and services whenever they are available, or when they could be made available commercially in response

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*United States Space Adventurers Pioneering the Final Frontier*, 70 J. AIR L. & COM. 639 (2005).

<sup>19</sup> These innovators had to climb out onto the wings of the aircraft, while in flight, to remove ice, and removed the front wheel of the plane to make it lighter, necessitating their crash landing in Ireland. See *Century of Flight*, <http://www.century-of-flight.net/Aviation%20history/daredevils/Atlantic%202.htm> (last visited July 29, 2007).

<sup>20</sup> See Charles Lindbergh, *An American Aviator*, <http://www.charleslindbergh.com/plane/orteig.asp> (last visited July 29, 2007).

<sup>21</sup> See Bigelow Aerospace, [http://www.bigelowaerospace.com/multiverse/space\\_prize.php](http://www.bigelowaerospace.com/multiverse/space_prize.php) (last visited July 29, 2007).

<sup>22</sup> *Id.* The reward advertisement is in the form of a classic old-west "Wanted: Dead or Alive" poster.

<sup>23</sup> 15 U.S.C.S. § 5808(a) (2007).

<sup>24</sup> *Id.* § 5808(b)(3).

<sup>25</sup> *Id.* § 5808(a) & (d).

to a Government procurement.<sup>26</sup> In commercial space projects which pose a reasonable potential for developing non-Federal markets to meet Federal needs in a cost effective manner, the Government even proposes becoming an anchor tenant for the project,<sup>27</sup> purchasing sufficient quantities of the commercial space products or service so that the project remains viable.<sup>28</sup>

It is clear from these statutes that a policy of promotion of commercial space endeavors has been enacted. Yet, commentators<sup>29</sup> and industry moguls<sup>30</sup> feel that the current legislative climate is counter-productive to the growing commercial space industry. The above analogies to the wild-west were intentional and apropos. Like uninhabited western territories, space presents a new arena where there is little legislation and much speculation, particularly with such things as standing, jurisdiction, property rights, criminal law and tort liability. Is Bigelow allowed some sort of easement against humanity for the orbital path of his space hotel? Does he retain a property right over discoveries made in space during his endeavors to create and run a space hotel? Should a homicide occur in Bigelow's space hotel, who has jurisdiction to prosecute the suspect? Does someone have standing to sue Bigelow for a slip-float in his hotel? All of these questions illustrate the fact that space law may be rife with revolutionary work for attorneys, but none of these scenarios can ripen into issues if the commercial space industry is hampered by legislation to the extent that the projects will not get off of the ground. With this in mind, the current state of international and U.S. National space law will be examined with

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<sup>26</sup> 15 U.S.C.S. § 5801(8) (2007).

<sup>27</sup> *Id.* at (9).

<sup>28</sup> *Id.* § 5802(2).

<sup>29</sup> See Catherine E. Parsons, *Space Tourism: Regulating Passage to the Happiest Place Off Earth*, 9 CHAP. L. REV. 493 (2006), and Bromberg, *supra* note 18.

<sup>30</sup> "The challenges [of the commercial space industry] are not so much technological (although those are great as well) as they are political and managerial....Without a conducive, healthy regulatory environment you are probably either patently optimistic or delusional to continue (I'm not sure where I fit). However, I'm now in the exploration of space business and at this point in time America is having an identity crisis. America's political passion for space is arguably indifferent and considering such laws as the ITAR (International Traffic in Arms Regulations), the regulatory environment is somewhat less than appealing." Bigelow Aerospace, statement by Robert T. Bigelow, <http://www.bigelowaerospace.com/multiverse/> (last visited July 29, 2007).

respect to issues which currently exist for entrepreneurs trying to go where no entrepreneur has gone before.

#### INTERNATIONAL SPACE LAW REGARDING COMMERCIAL SPACE TOURISM

Four core treaties,<sup>31</sup> promulgated by the United Nations Committee on the Peaceful Uses of Outer Space (COPOUS), govern International Space Law: (i) the Treaty on Principles Governing the Activities of the States in the Exploration and Use of Outer Space ("Outer Space Treaty")<sup>32</sup>; (ii) Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space ("Rescue Agreement")<sup>33</sup>; (iii) the Convention on International Liability for Damage Caused by Space Objects ("Liability Convention")<sup>34</sup>; and (iv) the Convention on Registration of Objects Launched into Outer Space ("Registration Convention").<sup>35</sup> Each of these treaties holds powerful language pertinent to the laws governing the commercial use of space and will be discussed in seriatim, with particular attention paid to the language affecting space tourism.

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<sup>31</sup> The fifth major treaty, the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies of 1979 ("Moon Treaty"), was not ratified by Congress and is not in force in the U.S. or any major space-faring nation. Several Congressmen and special interest groups, including the L5 Society, regarded the Moon Treaty as being overly restrictive of the ability of a State to develop natural resources in space. See GLENN H. REYNOLDS AND ROBERT P. MERGES, OUTER SPACE: PROBLEMS OF LAW AND POLICY 114 (Westview Press 2d ed. 1997). Although not ratified by Congress, the Moon Treaty might express an *opinio juris communis* and reflect a customary international law by formulating it and specifying its scope. See *Texaco Overseas Petroleum et al. v. Libyan Arab Republic*, International Arbitral Award, 17 I.L.M. 1 (Jan. 19, 1977).

<sup>32</sup> Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Jan. 1, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 2005, 18 U.S.T. 2410 [hereinafter Outer Space Treaty].

<sup>33</sup> 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, 672 U.N.T.S. 119, 19 U.S.T. 7570 [hereinafter Rescue Agreement].

<sup>34</sup> Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187, 24 U.S.T. 2389 [hereinafter Liability Convention].

<sup>35</sup> Convention on Registration of Objects Launched into Outer Space, adopted on Nov. 12, 1974, GAOR, 1023 U.N.T.S. 15, 28 U.S.T. 695 [hereinafter Registration Convention].

I. TREATY ON PRINCIPLES GOVERNING THE ACTIVITIES OF THE STATES IN THE EXPLORATION AND USE OF OUTER SPACE

The Outer Space Treaty of 1967 is the foundational treaty of international law with respect to the exploration and use of space. It furnishes a general basis for the peaceful uses of outer space and provides a framework for the development of outer space law.<sup>36</sup>

According to the terms of the Outer Space Treaty, the exploration and use of outer space shall be carried out for the benefit of all countries and shall be the providence of all mankind.<sup>37</sup> Outer space is not subject to national sovereignty,<sup>38</sup> nor shall it be used for anything other than peaceful purposes, although the use of military personnel is not prohibited.<sup>39</sup> Astronauts of one State are required to assist astronauts of another State.<sup>40</sup> The word 'astronaut' renders the clause uncertain as to whether it applies to space tourists or merely to the crew of space flights. Treaties, generally, are agreements between nations and have indirect effect on citizens of those nations, unless otherwise specified. Given that the Outer Space Treaty was established before space tourism was a practical consideration, it is strange to not extend the language to include space tourists.

Other language in the Outer Space Treaty, such as that in Article VI, has direct bearing on non-governmental organizations. States bear international responsibility for national activities in outer space, whether such activities are conducted by governmental agencies or non-governmental entities.<sup>41</sup> Through direct construction, this clause does not apply to suborbital activity, as a general rule has developed that an object in orbit is in space.<sup>42</sup> The altitude at which space begins is subject to debate, but U.S. National space law, as will be shown, addresses

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<sup>36</sup> See Outer Space Treaty, *supra* note 32, at Foreword, p. vi.

<sup>37</sup> *Id.* at art. I.

<sup>38</sup> *Id.* at art. II.

<sup>39</sup> *Id.* at art. IV.

<sup>40</sup> *Id.* at art. V.

<sup>41</sup> *Id.* at art. VI.

<sup>42</sup> See REYNOLDS, *supra* note 31, at 12.

this discrepancy.<sup>43</sup> What is important to note for the purposes of liability, is that it is the State that bears responsibility for non-governmental organizations, including commercial space flights, with respect to orbital activity.

With respect to liability, the Treaty further established that each State that launches, procures a launch, or from whose territory an object is launched is liable for damages to another State or to its natural or juridical persons.<sup>44</sup> The discussion to follow regarding the Commercial Space Law Amendments Act (CSLAA) is couched within this notion of State to State liability. It appears that U.S. National law was molded by this notion of State to State liability.

Finally, the Treaty creates a binding legal regime and some property rights through Article VIII. A State shall retain jurisdiction and control over an object launched into outer space, so long as that object appears on that State's registry, and ownership is not affected by the object's presence in space.<sup>45</sup>

The three remaining treaties deal specifically with concepts included in the Outer Space Treaty.<sup>46</sup> The Rescue Agreement elaborates upon Article V, pertaining to the treatment of astronauts. The Liability Convention supplements Articles VI and VII. Finally, the Registration Convention deals with Article VIII, further developing the binding legal regime of space law.

## II. AGREEMENT ON THE RESCUE OF ASTRONAUTS, THE RETURN OF ASTRONAUTS AND THE RETURN OF OBJECTS LAUNCHED INTO OUTER SPACE

The Rescue Agreement was formed out of an effort to give further concrete expression to the duties of signatory parties to the Outer Space Treaty, in respect to the assistance of astronauts in distress.<sup>47</sup> Most importantly, particularly to the discussion herein of space tourism, the Rescue Agreement extends the

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<sup>43</sup> The definition of launch includes orbital and suborbital space. See 49 U.S.C.S. § 70102(4) (2007).

<sup>44</sup> Outer Space Treaty, *supra* note 32, at art. VII.

<sup>45</sup> *Id.* at art. VIII.

<sup>46</sup> See *id.* at Foreword, p. vi.

<sup>47</sup> Rescue Agreement, *supra* note 33, at Preamble.

terms of the Outer Space Treaty, which covered only astronauts, to include personnel of a spacecraft.<sup>48</sup> ‘Personnel’ denotes a person at work.<sup>49</sup> However, the phrase is broader than the term ‘astronaut’ and the discrepancy is worth noting in regard to the interplay of U.S. legislation with the Rescue Agreement.

The Rescue Agreement provides procedures, for parties to the agreement, in terms of the notice to States that personnel of a spacecraft are in distress,<sup>50</sup> the rescue and rendering of assistance to the personnel,<sup>51</sup> and the safe and prompt return of the personnel.<sup>52</sup> The agreement also addresses the return of space objects.<sup>53</sup>

### III. CONVENTION ON INTERNATIONAL LIABILITY FOR DAMAGE CAUSED BY SPACE OBJECTS

While the Rescue Agreement is clearly the most important of the treaties from a humanitarian vantage—the health and safety of people clearly outweighs monetary concerns—the Liability Convention is the most important of the treaties from a lawyer’s perspective. The convention sets out a scheme of absolute, fault-based, and joint and several liability, the application of which depends on circumstances.

Absolute liability is prescribed for a launching State when damage is caused on the surface of the earth or to an aircraft in flight by that State’s space object.<sup>54</sup> A launching State includes a State that launches or procures a launch, as well as any State from whose territory or facility a space object is launched.<sup>55</sup> This is important because it means that a State is absolutely liable for damage caused by commercial launches executed from within its territory. If a Virgin Galactic flight, launched from within the United States, crashes into Auckland, the United

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<sup>48</sup> *Id.* at art. 1.

<sup>49</sup> Definition courtesy at MERRIAM-WEBSTER, <http://www.m-w.com/dictionary/personnel> (last visited July 29, 2007).

<sup>50</sup> Rescue Agreement, *supra* note 33, at art. 1.

<sup>51</sup> *Id.* at art. 2.

<sup>52</sup> *Id.* at art. 4.

<sup>53</sup> *Id.* at art. 5.

<sup>54</sup> Liability Convention, *supra* note 34, at art. II.

<sup>55</sup> *Id.* at art. I.

States would be absolutely liable. Exoneration from absolute liability is available if a launching State establishes that the damage has resulted from gross negligence or from an intentional act or omission on the part of a claimant State or of natural or juridical persons it represents.<sup>56</sup> Therefore, in the scenario described above, if Virgin Galactic is grossly negligent, then the United States may be exonerated from liability.

Fault-based liability is prescribed for a launching State when damaged is caused, elsewhere than on the surface of the earth to a space object or to persons or property on board a space object, by the space object of another launching State.<sup>57</sup> That this Article extends liability to persons on board a space object is extremely important, for a space tourist is a person on board a space object. The Liability Convention further elaborates the scope of fault-based liability in Article IV. Should damage result to a third State, or to its natural or juridical persons, through damage to one State's space object by another State's space object, those States are jointly and severally liable to the third State.<sup>58</sup> Should that damage occur on the surface of the earth, those States are absolutely liable to the third State.<sup>59</sup> If Robert Bigelow's space hotel reenters earth's atmosphere and showers debris on a neighborhood in Paris, the United States would be absolutely liable. Should damage occur to the space object of a third State, or to persons or property on board that space object, liability is based on the fault of those States, or on the fault of persons for whom those States are responsible.<sup>60</sup> Herein, again, the language of the Convention covers space tourists, in that they may be persons on board a third State's space object. Moreover, that the language extends to cover the fault of persons for whom those State are responsible is indicative that the Convention extends to commercial space launches that might fall within the responsibility of a State. Finally, the Convention allows for the burden of compensation, in the case of

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<sup>56</sup> *Id.* at art. VI.

<sup>57</sup> *Id.* at art. III.

<sup>58</sup> *Id.* at art. IV (1).

<sup>59</sup> *Id.* at art. IV (1)(a).

<sup>60</sup> *Id.* at art. IV (1)(b).

joint and several liability, to be apportioned between those States that were at fault.<sup>61</sup>

Given the scope of absolute liability, rendering the United States liable for commercial enterprises in many situations, it is not difficult to understand the want of law makers to regulate the industry. Whether or not this is beneficial remains to be seen.

It is important to note that the Liability convention does not apply to damage cause by a space object of a launching State to nationals of that launching State.<sup>62</sup> If a commercial launch vehicle, launched from the United States or procured for launch in another State by the United States, crashes into a house in New Jersey, the Liability Convention does not apply. The Convention, however, does not prevent a State, or the natural or juridical persons of that State, from pursuing a claim in the courts of that State.<sup>63</sup> Only States can bring a claim under the Liability Convention,<sup>64</sup> although nationals can present claims through their State. There is a one year statute of limitations on claims, conditioned on knowledge of the damage or a reasonable expectation of due diligence to discover the damage.<sup>65</sup> Finally, the Liability Convention makes no differentiation between space vehicles traveling to orbital or suborbital space, begging the question of the application of the general rule that objects in orbit are in space.

#### IV. CONVENTION ON REGISTRATION OF OBJECTS LAUNCHED INTO OUTER SPACE

The Registration Convention builds upon Article VIII of the Outer Space Treaty,<sup>66</sup> establishing procedures for registration of space objects launched into orbit or beyond.<sup>67</sup> As with the Liability Convention, a launching State is defined as a State which

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<sup>61</sup> *Id.* at art. V (2).

<sup>62</sup> *Id.* at art. VII.

<sup>63</sup> *Id.* at art. XI (2).

<sup>64</sup> *Id.* at art. VIII.

<sup>65</sup> *Id.* at art. X.

<sup>66</sup> The Registration Convention, *supra* note 35, at art. II (2).

<sup>67</sup> *Id.* at art. II (1).

launches or procures the launch of a space object, or from whose territory a space object is launched.<sup>68</sup> This is important because it indicates that a commercial space vehicle launched from the United States must be registered, but only if it is to proceed into orbit or beyond. The Registration Convention, according to its own terms, does not cover commercial space vehicles rising only to suborbital space—an important discrepancy between international and domestic law in the case of SpaceShipOne, which travels only to suborbital altitudes.

## U.S. NATIONAL SPACE LAW REGARDING COMMERCIAL SPACE TOURISM

### I. THE COMMERCIAL SPACE LAUNCH AMENDMENTS ACT

At the outset of a discussion of the Commercial Space Launch Amendments Act, it is important to note that, by the terms of the Act itself, all actions carried out pursuant to the Act must be consistent with obligations the United States has assumed under treaties, conventions, and agreements with foreign countries.<sup>69</sup> Therefore, the above mentioned treaties, conventions, and agreements apply to activities carried out under the CSLAA.

The purpose of the CSLAA is to promote economic growth and entrepreneurial activity through the use of the space environment and to encourage the United States private sector to provide launch vehicles, reentry vehicles and associated services.<sup>70</sup> Congress has found that space transportation is an important element of the transportation system of the United States and that there is a need to develop a strong space transportation infrastructure with significant private sector involvement.<sup>71</sup> The power to promote and encourage this commercial activity has been vested in the Secretary of Transportation, in that the Secretary is to oversee and coordinate commercial launches and reentries through the issuance of permits and li-

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<sup>68</sup> *Id.* at art. I (a)(i) & (ii).

<sup>69</sup> 49 U.S.C.S. § 70117(e)(1) (2007).

<sup>70</sup> *Id.* § 70101(b)(1) & (2).

<sup>71</sup> *Id.* § 70101(a)(8).

censes authorizing these operations.<sup>72</sup> The Secretary of Transportation has delegated his authority and responsibilities under the CSLAA to an Associate Administrator of the Office of Commercial Space Transportation,<sup>73</sup> which is a line of business of the Federal Aviation Administration.<sup>74</sup>

Launches include placing and attempting to place a vehicle and any payload, crew, or space flight participant in a suborbital trajectory, in Earth orbit in outer space, or otherwise in space.<sup>75</sup> Herein, unlike the international laws discussed above, suborbital activity is explicitly covered by the CSLAA. A space flight participant is any individual, who is not crew, carried within a launch vehicle or reentry vehicle.<sup>76</sup> A commercial company can, therefore, pursuant to the CSLAA, fly a paying passenger—space flight participant—into suborbital and orbital space. Space tourists are paying passengers. The suborbital flights and associated activities being offered by Virgin Galactic, as well as the proposed orbital activity being offered by Robert Bigelow, must meet the terms of the CSLAA.

The Secretary of Transportation has been delegated a dual-fold duty, in that, not only is he required to encourage, facilitate, and promote commercial space launches and reentries by the private sector,<sup>77</sup> but he also may promulgate regulations to encourage, facilitate, and promote the continuous improvements of the safety of launch vehicles designed to carry humans.<sup>78</sup> The duty is dual-fold in that, in the opinion of some writers, encouraging commercial space activity and promulgating regulations regarding safety and improvements are counter-productive aims.<sup>79</sup> It is their opinion, based on comparisons to the development of the aviation industry, that regulation will stifle the burgeoning space transportation industry.<sup>80</sup> An introduction to

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<sup>72</sup> *Id.* § 70101(b)(3).

<sup>73</sup> 14 C.F.R. § 401.3 (2007).

<sup>74</sup> *Id.* § 401.1.

<sup>75</sup> 49 U.S.C.S. § 70102(4).

<sup>76</sup> *Id.* § 70102(17).

<sup>77</sup> *Id.* § 70103(b)(1).

<sup>78</sup> *Id.* § 70103(c).

<sup>79</sup> See Parsons, *supra* note 29, and Bromberg, *supra* note 18.

<sup>80</sup> *Id.*

the statutory requirements and regulations is advantageous to a discussion of the whether these requirements and regulations might stifle the industry.

*(i) Restrictions: Licenses and Permits*

The CSLAA places restrictions on launches, operations, and reentries, in that a license or permit is required for any person to launch a launch vehicle, operate a launch or reentry site, or reentry a reentry vehicle in the United States.<sup>81</sup> This requirement applies to citizens of the United States, even when conducting these space-related activities outside of the United States,<sup>82</sup> unless an agreement exists between the United States and a foreign country wherein that country has jurisdiction over the space activities.<sup>83</sup> Even when the space activities are conducted within a foreign country by a citizen of the United States, a license or permit will be required if there is an agreement between that foreign country and the United States, wherein the United States has jurisdiction over the space activities.<sup>84</sup> It is important to note, in reference to the discussion of the International Traffic in Arms Regulations (ITAR) to follow, that the CSLAA expressly permits the export of space activities, subject only to a permit or license. After a license or permit is issued, the Secretary can prohibit, suspend or terminate a launch if he decides that the launch, operation, or reentry is detrimental to public health and safety, safety of property, national security or foreign policy interest.<sup>85</sup> This is a rather broad power, the exercise of which may inhibit the commercial space industry.

The CSLAA outlines requirements for the issuance of a license or permit. Permits are issued for experimental purposes regarding only reusable suborbital rockets launched or reentered solely for the purpose of research and development, a show of compliance with licensing procedure in order to obtain a

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<sup>81</sup> 49 U.S.C.S. § 70104(a)(1) (2007).

<sup>82</sup> 49 U.S.C.S. § 70104(a)(2) (2007).

<sup>83</sup> *Id.* § 70104(a)(3).

<sup>84</sup> *Id.* § 70104(a)(4).

<sup>85</sup> *Id.* § 70108(a).

license, or for crew training prior to obtaining a license.<sup>86</sup> A permit may not be used for carrying property or human beings for compensation or hire.<sup>87</sup> The experimental permit may be a particularly useful tool for the advancement of commercial space transportation, in that it authorizes an unlimited number of launches and allows modifications to a design without necessitating the issuance of a new permit.<sup>88</sup>

While a permit is sufficient for launches and reentries, it does not, however, authorize a person to operate a launch or reentry site.<sup>89</sup> Therefore, a separate license is needed to operate a launch or reentry site when launching and reentering a vehicle under a permit. Yet, the CSLAA also holds that only 1 license or permit is required to conduct activities involving crew or space flight participants, including launch and reentry.<sup>90</sup> This discrepancy is not clarified by the regulations promulgated by the FAA, pursuant to this act. Under the regulations, anyone operating a launch or reentry site must obtain a license.<sup>91</sup> The license to operate a launch or reentry site appears to be the same license that authorizes launches and reentries.<sup>92</sup> There-

<sup>86</sup> *Id.* § 70105a(d).

<sup>87</sup> *Id.* § 70105a(h).

<sup>88</sup> *Id.* § 70105a(e).

<sup>89</sup> *Id.* § 70104(a)(4).

<sup>90</sup> *Id.* § 70104(d).

<sup>91</sup> 14 C.F.R. §§ 413.3(2) & (4) (2007).

<sup>92</sup> 14 C.F.R. § 420.41 License to operate a launch site -- general.

(a) A license to operate a launch site authorizes a licensee to operate a launch site in accordance with the representations contained in the licensee's application, with terms and conditions contained in any license order accompanying the license, and subject to the licensee's compliance with 49 U.S.C. subtitle IX, ch. 701 and this chapter.

*Id.*

If an individual is a licensee under 49 U.S.C. subtitle IX ch. 701, as well as under this regulation, and the same application covers both, then the term "licensee" used herein refers to one and the same individual, and one and the same license. Therefore, a license to operate a launch site must be the same license as is required under the CSLAA. There is no separate license to operate a launch site that differs from a license to launch or reenter a vehicle. The regulation governing the operation of a reentry site is more vague:

14 C.F.R. § 433.3 Issuance of a license to operate a reentry site.

(b) A license to operate a reentry site authorizes a licensee to operate a reentry site in accordance with the representations contained in the licensee's applica-

fore, while it appears that one license may cover all of the activities associated with a launch and reentry, a permit does not, and a permit holder must obtain a license for the operation of a launch or reentry site. The advantages a permit offers for the encouragement of commercial space activity might be negated by this necessity.

Licenses come in two forms: a launch-specific license and a launch operator license. The former authorizes one or more launches within the same parameters, for a specified number of launches or within a period of time.<sup>93</sup> The latter authorizes launches within a wide range of parameters and is valid for five years.<sup>94</sup>

All requirements of United States law applicable to space activity are requirements for a license or permit.<sup>95</sup> This is particularly important in regard to the interplay of the CSLAA and the ITAR, to be discussed below.<sup>96</sup> The Secretary may also prescribe additional requirements if a launch vehicle is to carry a human being for compensation or hire.<sup>97</sup> These additional requirements, however, are limited to safety regulations,<sup>98</sup> restricting or prohibiting design features or operating practices of a commercial human space flight, which have either resulted in serious or fatal injury or contributed to an unplanned event that posed a high risk of causing a serious or fatal injury.<sup>99</sup> This limi-

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tion, subject to the licensee's compliance with terms and conditions contained in any license order accompanying the license.

14 C.F.R. § 433.3(b).

This regulation does not directly reference the CSLAA, as with the regulation governing a license to operate a launch site. It does, however, speak of the "licensee's application," which presumably is the application required under the CSLAA. The term licensee herein also refers to one and same individual as the CSLAA, and therefore, the license permitting the operation of launch and reentry sites is the same license discussed under 49 U.S.C.S. §70104(d), holding that only one license or permit is required for activities involving crew or space flight participants. However, the requirement may be site specific, as a vehicle may come down at a different place than where it went up. If this is the case, then two licenses might be required, held by different individuals.

<sup>93</sup> 14 C.F.R. § 415.3(a) (2007).

<sup>94</sup> *Id.* § 415.3(b) (2007).

<sup>95</sup> 49 U.S.C.S. § 70105(b)(1) (2007).

<sup>96</sup> 22 C.F.R. § 120 (2007).

<sup>97</sup> 49 U.S.C.S. § 70105(b)(2)(D).

<sup>98</sup> *Id.*

<sup>99</sup> *Id.* § 70105(c)(2)(C)(i) & (ii).

tation on the Secretary's power ends on 23 December 2012, after which he may issue any regulation regarding evolving safety standards.<sup>100</sup> Herein lies the potential for a stifling of the industry, should regulations promulgated by the Secretary become too restrictive.

Furthermore, the holder of a license or permit must inform the crew and space flight participants, in writing, that the U.S. Government has not certified the launch vehicle as safe for carrying crew or space flight participants.<sup>101</sup> The holder of a license or permit must also inform space flight participants of the risks involved in a launch and reentry, and the Secretary must inform the space flight participant in writing of information relating to probable loss.<sup>102</sup> These notice requirements speak to liability.

*(ii) Liability*

As is the case with most important endeavors, insurance companies are going to make some money. As described above, the Liability Convention places the responsibility for a commercial launch on the States involved in the launch. Therefore, as an additional requirement for issuance of a license or permit, the licensee must obtain liability insurance or demonstrate financial responsibility.<sup>103</sup> In the case of potential third party claims for death, bodily injury, or property damage, the licensee must demonstrate insurance or financial responsibility not greater than \$500,000,000.<sup>104</sup> In the case of potential claims by the U.S. Government for damage or loss to government property, the licensee must demonstrate insurance or financial responsibility not greater than \$100,000,000.<sup>105</sup> These required values of insurance may be less, if they exceed the maximum amount of liability insurance available on the world market.<sup>106</sup>

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<sup>100</sup> *Id.* § 70105(c)(3).

<sup>101</sup> *Id.* §§ 70105(b)(4)(B) & (5)(B).

<sup>102</sup> *Id.* § 70105(b)(5)(A).

<sup>103</sup> *Id.* § 70112(a)(1).

<sup>104</sup> *Id.* §§ 70112(a)(1)(A) & (a)(3)(A)(i).

<sup>105</sup> *Id.* §§ 70112(a)(1)(B) & (a)(3)(A)(ii).

<sup>106</sup> *Id.* § 70112(a)(3)(B).

The commercial space industry may be indirectly hampered by parameters outlined by insurance companies and by the inability to acquire insurance.

It is the duty of the Secretary of Transportation to provide payment by the U.S. Government for successful claims by a third party against a licensee.<sup>107</sup> Therefore, this policy acts as an indemnity for claims against the U.S. Government, in that it protects the Government from potential liability for involvement in launch services or reentry services.<sup>108</sup> This provision, however, does not cover claims for death, bodily harm, or property damage arising out of a licensee's willful misconduct.<sup>109</sup> Nor does it provide for payment of a successful third party claim for death, bodily harm or property damage against a space flight participant.<sup>110</sup> Moreover, claims may be paid by the Secretary for the U.S. Government only to the extent that the claim is more than the amount of insurance or financial responsibility and not more than \$1,500,000,000.<sup>111</sup> This liability cap places the CSLAA at odds with the Liability Convention, in that the Liability Convention does not limit the liability of a State. In the case where a claim exceeds this amount and the licensee cannot pay, the Liability Convention still assigns liability where the CSLAA exonerates the U.S. Government. The Secretary has broad power regarding payments issued by the U.S. Government, in that he may withhold payment if he certifies that the amount of a claim is not reasonable.<sup>112</sup>

Finally, the CSLAA provides that licenses shall contain reciprocal waivers of claims between the licensee and those involved in launch and reentry services, in regards to personal injury, death and property damage.<sup>113</sup> It mandates a similar waiver be executed between the Government and those involved

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<sup>107</sup> *Id.* § 70113(a)(1).

<sup>108</sup> 49 U.S.C.S. § 70112(a)(4) (2007).

<sup>109</sup> *Id.* § 70113(a)(2).

<sup>110</sup> *Id.* § 70113(a)(1).

<sup>111</sup> *Id.* §§ 70113(a)(1)(A) & (B).

<sup>112</sup> *Id.* § 70113(c). Of course, a separation of powers mandates that an amount awarded in a final decision of a court of competent jurisdiction be deemed reasonable by the Secretary of Transportation.

<sup>113</sup> *Id.* § 70112(b)(1).

in a launch or reentry (including licensees, crew and space flight participants) when the Government is involved in the launch or reentry.<sup>114</sup> This latter waiver, however, applies only to amounts claimed in excess of the insurance or demonstrated financial responsibility.<sup>115</sup>

## II. THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS

The President of the United States is authorized to control the export and import of defense articles and defense service by section 38 of the Arms Export Control Act (AECA).<sup>116</sup> The President has delegated his authority to promulgate regulations under the AECA to the Secretary of State.<sup>117</sup> ITAR has been promulgated by the Secretary of State, pursuant to the AECA.

Under ITAR, the President designates, in the U.S. Munitions List,<sup>118</sup> certain articles and services as defense articles and defense services.<sup>119</sup> These designations are made by the Department of State in concurrence with the Department of Defense.<sup>120</sup> The export of any article or service on the List is regulated by the Department of State.<sup>121</sup> Moreover, certain items on the list are further designated as significant military equipment (SME) necessitating special export controls.<sup>122</sup> Rockets,<sup>123</sup> launch vehicles,<sup>124</sup> ablative materials fabricated from advanced composites for use with items on the List<sup>125</sup> and spacecraft<sup>126</sup> are all on the Munitions List and are all designated as Significant Military Equipment.<sup>127</sup> Furthermore, all technical data related to these items is included in the List and is also designated to be signifi-

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<sup>114</sup> *Id.* § 70112(b)(2).

<sup>115</sup> *Id.*

<sup>116</sup> 22 U.S.C. § 2778 (2007).

<sup>117</sup> 22 C.F.R. § 120.1(a).

<sup>118</sup> *Id.* § 120.3(b).

<sup>119</sup> *Id.* § 120.2.

<sup>120</sup> *Id.*

<sup>121</sup> *Id.* § 120.5.

<sup>122</sup> *Id.* § 120.7.

<sup>123</sup> *Id.* § 121.1, Category IV (a).

<sup>124</sup> *Id.* at Category IV (b).

<sup>125</sup> *Id.* at Category IV (f).

<sup>126</sup> *Id.* §121.1, Category XV (a).

<sup>127</sup> *Id.* §121.1(b).

cant military equipment.<sup>128</sup> Beyond the designations of defense article/defense service, and significant military equipment, these items have yet a further designation as major defense equipment, subject to the AECA, if they have a nonrecurring research and development cost exceeding \$50,000,000 or a total production cost of more than \$200,000,000.<sup>129</sup> These designations place these items under the scrutiny of the Department of Defense, as well as the Department of State.

The activities of Virgin Galactic, those competing in the America's Space Prize, and Mr. Bigelow's plans for space tourism fall under the auspices of ITAR, in that spacecraft and launch vehicles, as well as associated technical data, are covered under the Munitions List, are designated significant military equipment and may also be major defense equipment.<sup>130</sup> This could create a serious problem should these endeavors be attempted by a citizen of the United States in a foreign country, for this constitutes an export to be regulated by the Department of State. The nature of launch windows might compel the space tourism industry to have launch and re-entry facilities in various positions around the world in order to be commercially viable. As noted above, the CSLAA expressly permits the export of commercial space activities, subject only to the issuance of a license or permit. That permit or license can be suspended or revoked if it is necessary to protect a national security or foreign policy interest.<sup>131</sup> These issues may arise under ITAR, subjecting a licensee to suspension or revocation of the license. Conversely, the Secretary of Transportation, in prescribing additional requirements for a license or permit, may waive a U.S. law by a regulation stating that the law not be a requirement.<sup>132</sup> This may relieve the space industry of the rigors of ITAR and any associated permits or licenses that may be required for the ex-

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<sup>128</sup> *Id.* at (b), Category IV (i), & Category XV (f).

<sup>129</sup> *Id.* § 120.8.

<sup>130</sup> SpaceShipOne purportedly cost only \$25,000,000. While it escaped the onerous distinction of major defense equipment, it is still significant military equipment under the Munitions List. Jeff Foust, *SpaceShipOne plus Two*, THE SPACE REVIEW, June 26, 2006, <http://www.thespacereview.com/article/646/1>.

<sup>131</sup> 49 U.S.C.S. § 70107(c)(2).

<sup>132</sup> *Id.* § 70105(b)(2)(C).

port of items and technical data on the Munitions List. The extent of the Secretary of Transportation's authority herein is unclear, however, in that the Secretary must first consult the appropriate executive agencies regarding issues of national security and foreign policy interests.<sup>133</sup> The Departments of State and Defense will surely not relinquish their control over these items on the Munitions List. The controls on exports described above may be the source of the stipulations in Bigelow's America's Space Prize that the contestant be domiciled and have a principle place of business in the United States.<sup>134</sup> These controls present serious hurdles for entrepreneurs of the commercial space industry.

If the encouragement and development of commercial space launches and reentries are consistent with national security and foreign policy interests,<sup>135</sup> it is curious that national security and foreign policy interests regard spaceships as Munitions, the control of which is subject to strict scrutiny by the Departments of State and Defense. Military designs for the use of this technology explain this discrepancy. The Marine Corp is currently developing a Small Unit Space Transport and Insertion (Sustain) system.<sup>136</sup> The system includes a launch craft and lander capable of suborbital flight, similar to White Knight and SpaceShipOne, which will enable Marines to be deployed to a host country anywhere in the world in less than two hours, eliminating the need to negotiate flight permission through foreign airspace.<sup>137</sup>

The fact that the military has designs for this technology does not necessitate having spacecrafts and associated materials on the Munitions List, for there are many forms of technology employed for combat purposes, included airplanes and other vehicles of transport, that are not on the Munitions List. This point is strengthened by the fact that items to be included on the Munitions List cannot have a predominantly civil applica-

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<sup>133</sup> 49 U.S.C.S. § 70105(b)(2)(C).

<sup>134</sup> See Bigelow Aerospace, *supra* note 21.

<sup>135</sup> 49 U.S.C.S. § 70101(6).

<sup>136</sup> See *Semper Fly, Marines in Space*, POPULAR SCIENCE, Dec. 2006, <http://www.popsci.com/popsci/aviationspace/f2c1d65a5f59f010vgnvcm1000004eeebccdrerd.html>.

<sup>137</sup> *Id.*

tion,<sup>138</sup> nor can they have a performance equivalent to articles or services used for civilian application.<sup>139</sup> Spacecrafts, associated materials, and the technical data regarding these, clearly have a performance equivalent to articles used for civilian application, and therefore, should not be on the Munitions List. Their inclusion on the Munitions List violates the express terms of ITAR.

Moreover, it is difficult to legally conclude that spacecraft can be on the Munitions List, when the CSLAA and the AECA are given equal footing as Acts of Congress. ITAR indirectly contravenes the CSLAA in that it restricts the commercial space industry where the CSLAA expressly states a policy of promotion.<sup>140</sup> Nothing in the AECA, through which ITAR has been promulgated, contravenes the CSLAA. Where the AECA is silent regarding spacecraft, begging the question as to why they are on the Munitions List, the CSLAA expressly promotes the commercial use of spacecraft. ITAR, in regards to spacecraft being on the Munitions List, should be invalid, for *lex specialis derogate generali*—the specificity of the CSLAA prevails over the generality of the AECA. The invalidity of ITAR, in regard to the commercial space industry, can easily be cured without an Act of Congress. Not only would amending the Munitions List not affect the AECA, the amendment would be done pursuant to the AECA, which compels the President to periodically review the Munitions List to determine which items no longer warrant export controls.<sup>141</sup>

To conclude, because the CSLAA expressly promotes the commercial space industry, the AECA is silent regarding the commercial space industry, and ITAR excludes articles and services with civilian applications, the Munitions List should be amended, pursuant to the AECA, removing space crafts and associated materials from the Munitions List.

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<sup>138</sup> 22 C.F.R. § 120.3(a)(i).

<sup>139</sup> *Id.* at (ii).

<sup>140</sup> 49 U.S.C.S. §§ 70101(b)(1) & (2) (2007).

<sup>141</sup> 22 U.S.C.S. § 2278 (f)(1) (2007).

## CONCLUSION

I. THE COMMERCIAL SPACE INDUSTRY IS NOT  
THE AVIATION INDUSTRY

Powerful arguments, based on comparisons to the dawn of the aviation industry, exist for the complete relaxation of the regulatory environment of the commercial space industry.<sup>142</sup> The claims of these authors are valid and true.<sup>143</sup> But a comparison of the commercial space industry to the commercial shipping industry might be more relevant, due to the order in magnitude of the cost of commercial space transportation. The poster for the 1992 Discovery mission harkened back to the Age of Discovery with the depiction of Columbus' ships and the date 1492.<sup>144</sup> The race to discovery and colonization in the 1500's was not unlike the Cold War race to space, in that it was initially nations, as opposed to private enterprises, funding exploration. An exploration into the history and applicable laws governing the dawn of the commercial shipping industry might be more relevant to a discussion of the commercial space industry. This discussion is beyond the scope of this paper. It may indicate, however, that state subsidization was an essential step toward the development of the commercial shipping industry, rather than a deleterious impediment.

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<sup>142</sup> See Parsons, *supra* note 29, Bromberg, *supra* note 18, and *Commercialization of Space Commercial Space Launch Amendments Act of 2004*, 17(2) HARVARD J.L. & TECH. 619 (Spring 2004).

<sup>143</sup> Spencer H. Bromberg writes:

First, the initial failure to reach out to private industry cemented the perception that the government could best conduct space activities. Second, there were no contracts, rewards or other incentives to promote private investment in launch vehicles. Third, the resulting monopolistic governmental bureaucracy stifled innovation normally encountered in competitive commercial markets. These principal factors, when combined with adverse space law, led to the commercial space travel industry in America advancing no further than the initial efforts to put man into space.

Bromberg, *supra* note 18, at 647. His detailed description of the development of the aviation industry and the laws leading up to the CSLAA strongly supports all of these conclusions. *Id.*

<sup>144</sup> The poster can be seen on display in the lobby of the Michoud Assembly Facility, New Orleans, Louisiana, U.S.A.

## II. CONCLUDING SUMMATION

The history of space tourism strongly indicates that it is an area with serious potential for strengthening the transportation infrastructure in the United States, through research and development and the construction of facilities. It also indicates, given the strong interest shown already by consumers, that it has the potential to be an economic boon. Current laws, including the Government's stance on anchor tenancy and its embracing of the contest prize, offer strong encouragement for the industry. But, as with most industry, regulation runs the risk of suppression. Moreover, without custom and practice to dictate appropriate norms of conduct, regulation from the government runs the risk of being errant.

While the restrictions of the CSLAA should be relaxed to permit the industry to grow and regulate itself, the absolute liability imposed by the Liability Convention presents a serious financial concern for the United States. The CSLAA seems to strike an effective balance between an effort to empower those involved in the commercial space industry and the liability concerns raised by the Liability Convention. To some extent, the CSLAA achieves its goal in encouraging the commercial space industry. Its experimental permit removes license requirements easing impediments to research and development. But the positive effects of the CSLAA will most likely be muddled by other U.S. National laws, such as ITAR.

## **AGREEMENT**

### **EUROPEAN COOPERATING STATE AGREEMENT BETWEEN THE EUROPEAN SPACE AGENCY AND THE GOVERNMENT OF THE REPUBLIC OF POLAND**

#### **DISCLAIMER**

This agreement has not yet been ratified hence it is not legally binding. According to the agreement Poland has a year since the day of signature to ratify.

The Ministry of Economy of Poland

The Government of the Republic of Poland,

and

the European Space Agency, hereinafter referred to as “the Agency”, established by the Convention opened for signature in Paris on 30 May 1975, hereinafter referred to as “the Convention”,

hereinafter referred to as the “Parties”,

CONVINCED of the benefits of sustaining and enhancing the level of international cooperation in space activities for exclusively peaceful purposes,

HAVING REGARD to the results of the cooperation achieved under the Agreement between the Agency and the Government of the Republic of Poland signed on 24 January 2002 and entered into force on 22 November 2002 ,

HAVING REGARD to the Resolution on the implementation of measures concerning the European Cooperating States (ECS) adopted by the Agency Council on 21 March 2001 (ESA/C/CL/Res. 2 (Final)), by which the Agency introduced a new cooperative approach designed for European non-Member States with a view to their possible accession to the Convention,

CONSIDERING the wish expressed by the Government of the Republic of Poland to implement the European space policy and to strengthen its cooperation with the Agency within the frame of this new ECS cooperative approach,

HAVING REGARD to Articles II and XIV.1 of the Convention,

HAVE AGREED AS FOLLOWS:

#### ARTICLE 1

- 1.1 Through the present Agreement, the Agency and the Government of the Republic of Poland agree to cooperate in space activities, in accordance with the terms herein. For the purpose of such cooperation, upon entry into force of this Agreement, the Republic of Poland shall become a European Cooperating State (hereinafter referred to as "ECS"). The Government of the Republic of Poland hereby acknowledges and accepts that the Agency establishes cooperation agreements with other non-Member States similar to the present Agreement, thus also qualifying such other States as ECS's.
- 1.2 The Government of the Republic of Poland agrees that, at all levels of its cooperation with the Agency as an ECS, it will act in conformity with the purposes for which the Agency was created as defined in the Convention, in particular the exploration and utilisation of space for exclusively peaceful purposes.

#### ARTICLE 2

- 2.1 The Government of the Republic of Poland shall be associated with implementation of the Agency's jointly selected programmes and activities, exclusive of the Agency's basic

technology research programme, through its financial contribution to the Plan for European Cooperating States (hereinafter referred to as “PECS”), the content of which shall be mutually agreed with the Agency, subject to the other provisions of the Agreement.

- 2.2 The Government of the Republic of Poland shall also receive Announcements of Opportunity for Agency scientific missions allowing it to propose the procurement of instruments to be integrated in these Agency missions at Principal Investigator (PI) or Co-Investigator (CI) level.

### ARTICLE 3

- 3.1 Subject to the terms of Article 7 and the prior requirements and obligations of the Agency, the Government of the Republic of Poland shall have access on a cost-reimbursable basis to the Agency’s facilities and services for its national space projects covered by the present Agreement. The methods used in calculating costs shall be those applied to the Agency’s Member States when utilising Agency facilities and services for their own national space projects. In return, the Government of the Republic of Poland shall make its facilities and services available to the Agency and its Member States on equitable terms.
- 3.2 In developing its national space potential and in planning national space missions, the Government of the Republic of Poland shall make primary reference to the use of European space transportation systems, and of facilities, products and services belonging to, or developed or operated under the auspices of, the Agency or its Member States. The Government of the Republic of Poland shall, further, support the Agency’s efforts to promote the use of European transportation systems, facilities, products and services by those international bodies to which it belongs that employ systems or services with a space-based component.

## ARTICLE 4

- 4.1 For the purposes of this Agreement “Intellectual Property” has the meaning stated in Article 2 of the Convention establishing the World Intellectual Property Organisation, done in Stockholm, 14 July 1967.
- 4.2 The Parties shall ensure adequate and effective protection of Intellectual Property as may arise from the work done under this cooperation Agreement and of any pre-existing rights that may come into play in the course of such cooperation.
- 4.3 The specific provisions concerning the rights of access, dissemination and use of technical information and data as well as intellectual property developed under the present Agreement, shall follow the Agency’s rules and procedures.
- 4.4 The Parties shall strive, within the framework of the legislation or regulations applicable to each of them, to facilitate exchanges of scientific and technical information, data and goods, of mutual interest concerning space science, technology and applications necessary for the implementation of the present Agreement.

## ARTICLE 5

- 5.1 The Republic of Poland and the Agency shall exchange information concerning:
  - (a) the content and planning of their current and future space programmes;
  - (b) matters of scientific and technical interest arising out of their space activities. In particular, the Government of the Republic of Poland shall receive reports published and made available by the Agency, as well as information relating to the progress of Agency programmes.
- 5.2 Provision of any Agency information shall in all cases be subject to the observance by the Government of the Republic of Poland of any proprietary rights to the informa-

tion, while the Government of the Republic of Poland further undertakes not to disseminate information that is classified subject to non-disclosure Agreements signed with the Agency or is not otherwise generally available beyond the territories of the Republic of Poland and the Agency's Member States, whether directly or through intermediaries operating within or outside those territories.

- 5.3 The Government of the Republic of Poland shall not be required to communicate any information obtained outside the Agency if it considers that such communication would be inconsistent with the interests of its own agreements with third parties, or the conditions under which such information was obtained.
- 5.4 The Government of the Republic of Poland and the Agency shall, as appropriate, exchange experts concerned with work within the competence of the Agency, in conformity with the laws and regulations relating to the entry into, stay in or departure from the Republic of Poland.
- 5.5 The Government of the Republic of Poland shall have access to the Agency's young graduate and fellowship programmes, subject to conditions to be mutually agreed.
- 5.6 The Government of the Republic of Poland and the Agency shall also consult together when they are represented at international organisations, conferences and meetings relating to space activities, for the purpose of exchanging views on matters of mutual concern and shall seek to harmonise as appropriate their positions on matters which are likely to have a bearing on implementation of their common space programmes and activities.

#### ARTICLE 6

- 6.1 For matters relevant to the implementation of this Agreement and the coordination with other ECS's, a dedicated committee referred to as the "PECS Committee" shall be established by the ECS's and shall be operated in accordance with the terms of the attached Appendices to the present Agreement.

- 6.2 For matters relating to the PECS, the Government of the Republic of Poland shall be entitled to attend meetings of the Agency's Council and/or its subsidiary bodies as an observer through one representative, who may be accompanied by advisers. The Government of the Republic of Poland shall receive draft agendas and relevant documents available to Member States to enable it to participate in meetings of Council and/or its subsidiary bodies as an observer.

#### ARTICLE 7

The Government of the Republic of Poland shall participate in and, in conformity with the Agency's financial regulations and instructions, contribute financially to the PECS, in particular through its subscription of the "PECS Charter", in accordance with the terms of the Appendices to the present Agreement.

#### ARTICLE 8

- 8.1 With respect to the geographical distribution of contracts relating to the PECS in which the Government of the Republic of Poland participates, the Agency shall implement the applicable industrial policy rules referred to in Appendix I to the present Agreement.
- 8.2 Special yearly reviews shall be held between the Agency and the Government of the Republic of Poland in order to discuss the convergence and complementarity of Polish industries with the space industries of the Agency's Member States.

#### ARTICLE 9

For the execution of the Agency's official activities undertaken within the frame of the present Agreement, the Government of the Republic of Poland shall grant the following privileges and immunities:

- 9.1 The Agency shall have, in the territory of the Republic of Poland, legal personality. It shall in particular have the capacity to contract, to acquire and dispose of movable

and immovable property, and to be a party to legal proceedings.

9.2 The Agency shall have immunity from jurisdiction and execution except:

- a) where the Agency has expressly waived such immunity in a particular case;
- b) in respect of a civil action by a third party for damage arising from an accident caused by a motor vehicle belonging to, or operated on behalf of the Agency, or in respect of a motor traffic offence involving such a vehicle;
- c) in respect of an enforcement of an arbitration award made under Article 12 below.

9.3 Within the scope of its official activities, the Agency, its property and income shall be exempt from direct taxes in the Republic of Poland. The Agency shall also be exempted from indirect taxes when purchases or services of substantial value, strictly necessary for the exercise of the official activities of the Agency within the frame of the present Agreement, are made or used, by the Agency.

9.4 Goods imported or exported by the Agency and strictly necessary for the exercise of its official activities shall be exempt from all import and export duties and taxes and from all import or export prohibitions and restrictions. Any such imported or exported goods may not be sold, lent or transferred with or without payment in the territory of the Republic of Poland except according to conditions defined by the Government of the Republic of Poland. The Government of the Republic of Poland and the Agency shall define the procedures to be applied to the export or import of assets used in connection with their cooperation. The Agency shall cooperate with the Polish authorities in order to ensure that the goods imported or exported by the Agency are being used for its official activities undertaken within the frame of the present Agreement.

- 9.5 The Agency may receive and hold in the Republic of Poland any kind of funds, currency, cash or securities; it may dispose of them freely in the Republic of Poland for any official purpose of the Agency and hold accounts in any currency.
- 9.6 Staff members of the Agency shall be exempt from taxes on their salaries, emoluments, benefits and pensions received in respect of current or previous service with the Agency; such exemption shall also extend to benefits paid to members of their families.
- 9.7 The circulation of publications and other information material sent by or to the Agency shall not be restricted in any way.

#### ARTICLE 10

The Government of the Republic of Poland shall notify the Agency's Director General of the name of the authority appointed to represent it for the implementation of the present Agreement, as well as the names of its representative and advisers attending any meetings in accordance with Article 6 above.

#### ARTICLE 11

The Parties shall each be solely liable for the conduct of their own activities in the execution of the present Agreement. In particular, they shall each have a right of recourse against the other in respect of damage of any kind to persons or property caused by the other and shall hold each other harmless against any claims made by a third party in respect of damage caused by their own activity.

#### ARTICLE 12

- 12.1 Any dispute arising out of the application or interpretation of this Agreement which cannot be settled amicably between the parties shall, at the request of either party, be submitted to an arbitration tribunal.

- 12.2 The arbitration tribunal shall consist of three members, one arbitrator appointed by the Agency, one designated by the Government of the Republic of Poland and a third arbitrator, who shall be elected by the first two arbitrators and who shall be the Chairman. If, within a period of six months from the date of the request for arbitration, either party has not named its choice, the arbitrator shall, at the request of either party, be appointed by the President of the International Court of Justice. The same procedure shall apply if, within six months of the designation or appointment of the first two arbitrators, the third has not been elected.
- 12.3 The arbitration Tribunal shall establish its own procedure; its decision shall be final and binding.

#### ARTICLE 13

The Appendices to the present Agreement shall form an integral part of the present Agreement.

#### ARTICLE 14

- 14.1 The present Agreement, after signature by the Parties and its approval in accordance with the legal order of the Republic of Poland, shall enter into force upon subscription by the Government of the Republic of Poland of the PECS Charter referred to in Article 7 and detailed in Appendix I, except for the rules contained in Appendix II A and B which shall be applicable upon signature. This subscription of the PECS Charter shall be made at the latest one year after the signature of the present Agreement unless the Parties have agreed another time limit. In the event the said subscription has not occurred within the above time limit, the present Agreement shall be null and void.
- 14.2 Upon its entry into force, the present Agreement shall replace the cooperation agreement between the Agency and the Government of the Republic of Poland referred to in the preamble, it being understood that its provisions

shall nevertheless continue to apply to the extent necessary to secure the implementation of any contracts that have been concluded within the framework of that agreement and which are still effective on the date on which that agreement ceases to have effect.

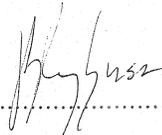
#### ARTICLE 15

- 15.1 Unless previously terminated in accordance with the provisions of paragraph 3 below, the present Agreement shall terminate five years after the date of its entry into force. One year before the expiry of this Agreement, the Parties shall review the results of its implementation on the basis of the outcome of the yearly reviews referred to in Article 8 and shall examine ways and means of continuing or further developing such cooperation. The Parties shall in particular examine the possibility of the Government of the Republic of Poland being granted the status of Associate Member or Member State of the Agency.
- 15.2 In the event of the continuation of the present cooperation, the present Agreement may be extended by mutual agreement in writing.
- 15.3 Either party may denounce the Agreement by giving written notice not less than one year before the intended date of termination which shall correspond to the end of the calendar year.
- 15.4 Termination of this Agreement shall not affect the validity of those rights and obligations of either Party which are meant to survive termination of the Agreement or its interpretation such as, but not limited to, arbitration, confidentiality, liability, intellectual property rights, nor of contracts entered into in pursuance of this Agreement. After the termination of the present Agreement, the Government of the Republic of Poland shall in particular remain bound to finance its share of the payment appropriations corresponding to the contract authority approved under the budget for the current or previous financial years relating to the PECS.

15.5 The Government of the Republic of Poland and the Agency may amend the provisions of this Agreement by mutual agreement. Amendments, except for those made exclusively to the appendices, shall take effect on the date of notification that both parties have met the necessary internal conditions for the amendments to enter into force. Amendments made exclusively to the Appendices shall be made in accordance with the terms of these appendices.

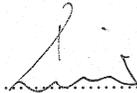
Done at ..... Warsaw ..... on ..... the 27<sup>th</sup> of April 2007 .....

in two originals in the English and Polish languages, both texts being authentic. The Agency will provide translations in the French and German languages.



.....

**For the  
Government of the Republic of Poland**



.....

**For the  
European Space Agency**

## APPENDIX I

PLAN FOR EUROPEAN COOPERATING STATES (PECS):  
OBJECTIVES, RULES AND PROCEDURES

## I OBJECTIVES

*I.1 Overall objectives of the PECS*

The overall objective of the PECS is to associate the Government of the Republic of Poland with Agency programmes and activities and to prepare in the most efficient manner for possible future accession to the ESA Convention.

*I.2 Specific objectives of the PECS*

- a) Develop cooperation between scientific and applications user communities in the Republic of Poland and Agency Member States.
- b) Create and strengthen the respective industrial expertise and capacity of the Republic of Poland with a view to allowing a fair and equitable industrial participation in future Agency programmes after accession.
- c) Provide indirect access to ESA programmes and activities and access to joint Agency/EU programmes, in accordance with the terms and conditions of the applicable legal instruments.
- d) Foster the Government of the Republic of Poland's understanding of the Agency's organisation and functioning of European space products, standards and procedures.
- e) Ensure coherence between the space activities of Member States and the Government of the Republic of Poland e.g. by avoiding unnecessary duplication.

### *I.3 Areas and Categories of Activities to be Covered by the PECS*

I.3.1 The PECS will cover four main categories of activities, as defined in I.3.2 below, in the following five areas:

- a) Space science, in particular space astronomy and astrophysics, solar system exploration and solar-terrestrial physics;
- b) Earth observation research and applications, in particular environmental monitoring, meteorology, aeronomy and geodesy;
- c) Telecommunications, in particular service demonstrations and satellite navigation;
- d) Microgravity research, in particular space biology and medicine, and materials processing;
- e) Ground segment engineering and utilisation.

I.3.2 The categories of activities covered by the PECS are the following:

- a) Technology and equipment relating to ESA optional programmes which are not on the critical path for execution of the Agency's programmes ("non-critical path technology");
- b) Scientific projects and/or experiments;
- c) Data exploitation;
- d) Support to Small and Medium Enterprises (SMEs).

I.3.3 The detailed activities to be covered by the PECS shall be defined in a rolling five-year plan to be renewed, at the end of the fourth year of each five-year period in the light of the negotiations concerning renewal of the Agreement between the Agency and the Government of the Republic of Poland, for a new five-year period starting at the end of the fifth year. The five-year draft plan shall be approved

within the framework of the PECS Committee and may be updated every year in accordance with the procedures set out below.

## II. RULES AND PROCEDURES

### *II.1 Implementation of the PECS*

- II.1.1 The Agency shall execute the PECS in conformity with its rules and procedures, unless otherwise provided for in the present objectives, rules and procedures.
- II.1.2 A dedicated Committee, hereinafter referred to as “the PECS Committee”, shall be set up to monitor and control implementation of the PECS. The Committee’s terms of reference and rules of procedure are described in Appendix II below.
- II.1.3 National institutions under the jurisdiction of the Republic of Poland may, at the Agency’s request and with the agreement of the Government of the Republic of Poland, provide technical support for one or more activities to be executed under the PECS; where appropriate, such support shall be covered by an exchange of letters between the institution concerned and the Agency, which shall be forwarded for information to all the other ECSs and to the Council of the Agency.
- II.1.4 The Agency shall make its facilities and services available for activities performed under the PECS in accordance with the provisions of Article 3.1 of the present Agreement. In particular the Agency’s Electronic Mail Invitation Tender System (EMITS) shall be made available to registered firms in the Republic of Poland on the following conditions:
- a) Read-only access for Agency programmes; and
  - b) Full access to activities included in the PECS, and access to joint Agency/EU programmes, in accordance with the terms and conditions of the applicable legal instruments.

*II.2 Content of the PECS*

Prior to the start of activities for a five-year period, the Agency shall draw up a five-year PECS, based on inputs received from the Government of the Republic of Poland and Member States in accordance with the following procedure:

II.2.1 The Agency shall consult with the Government of the Republic of Poland on its wishes regarding non-critical path technology.

II.2.2 Taking into account the provisions of Article 6 of the Agreement, the Agency shall thereafter establish a preliminary draft five-year PECS to be discussed in each Programme Board and Committee, and shall submit it for approval, by a two-thirds majority vote of the Member States or the participants concerned, to the following Agency Committees and Programme Boards with a view to its approval by the PECS Committee:

a) to the relevant Agency Programme Boards: with respect to contributions by the Government of the Republic of Poland in the development and/or the exploitation phase of systems and payloads or to the development of non-critical path technology, to be undertaken within the framework of Agency optional programmes;

b) to the Science Programme Committee (SPC): with respect to contributions by the Government of the Republic of Poland in the development and/or the exploitation phase or in the development of non-critical path technology, to be undertaken within the framework of Agency scientific projects.

c) to the Industrial Policy Committee (IPC): with respect to the inclusion in its PECS of the development of certain technologies listed in the Agency's Technology Master Plan to be undertaken by the Government of the Republic of Poland or the development by the latter of non-critical path technology in this field and of activities to be undertaken in support of SMEs.

In addition, if the PECS activity is included within the scope of the activities as defined in Annex A to a programme Declaration in force or in the process of being finalised, the corresponding Declaration or draft Declaration shall be amended or shall acknowledge this PECS contribution accordingly.

The IPC shall also examine and approve by a simple majority vote of all Member States the industrial policy aspects of the PECS before it is submitted to the PECS Committee for approval.

- II.2.3 The Agency shall thereafter prepare a consolidated PECS on the basis of the elements approved by the relevant Committees and Programme Boards with a view to its examination and approval by the PECS Committee. The Government of the Republic of Poland shall at this stage inform the Agency and the PECS Committee of the activities it wishes to support, taking into account the convergence and complementarity of Polish industries with the ESA Member States, and shall also give the Agency confirmation of its intended contribution to the funding of the activities concerned.
- II.2.4 Prior to approval of the five-year PECS by the PECS Committee, any changes in the content of the proposed activities requested by the PECS Committee, with the exception of deleted activities, shall be forwarded for examination to the relevant Committees and Programme Boards. The relevant Committees and Programme Boards shall thereafter forward their approval of the proposed changes to the PECS Committee for its approval.
- II.2.5 Once the PECS Committee has approved the five-year PECS, the Agency shall, on the basis of that PECS, prepare a specific instrument, hereafter called the "PECS Charter" (referred to in Article 14.1), allowing the Government of the Republic of Poland to commit financially to the PECS. The PECS Charter shall include the references of the activities to be financed by the Government of the Republic of Poland as defined in the approved PECS and

shall show the corresponding financial contribution to be subscribed by the Government of the Republic of Poland including its financial share of the internal costs of the Agency referred to in paragraph II.4, together with the corresponding indicative breakdown and schedule of payments. The PECS Charter shall be presented by the Agency to the Government of the Republic of Poland for subscription and shall thereafter be transmitted to the PECS Committee for information.

II.2.6 The five-year PECS may be revised and updated once every year during this five-year period to take into account new activities that are proposed by the Agency and in which the Government of the Republic of Poland or another ECS has expressed an interest. Approval of the yearly revision of the PECS shall be preceded by approval by the relevant Agency Committees and Programme Boards. If as the result of the above procedure new activities are added to the PECS, the PECS Charter shall be amended by the Agency accordingly and the Government of the Republic of Poland shall agree on its resulting increased contribution, if any, as reflected in the updated PECS Charter.

### *II.3 Industrial Policy Principles*

II.3.1 The PECS shall be based on a guaranteed geographical return coefficient of 1. The geographical return shall be calculated according to the Resolution on the Regulation Concerning the Calculation of the Geographical Return Coefficients (ESA/CXXXVIII/Res. 6 (Final)) adopted by the Agency Council.

II.3.2 When defining the content of the five-year work plan of the PECS and any revision thereof, the following industrial policy principles shall be applied:

- a) non-distortion of competition;
- b) complementarity with existing expertise in Member States;

- c) complementarity with the activities undertaken in the approved ESA programmes;
- d) impact on the development of the use of services derived from European space assets;
- e) technological value for the Agency with emphasis on:
  - innovation potential
  - compatibility with the European Technological Master Plan and/or with the future programmatic needs of the Agency;
- f) impulse to European industrial networking;
- g) opening of new markets for competitive suppliers;
- h) involvement of SME's.

II.3.3 These criteria will also be used by the IPC when examining and reviewing the draft PECS.

#### *II.4 Financial Matters*

- II.4.1 The PECS shall be financed through contributions by the ECS made in accordance with the rules and procedures of the Agency, which will be formalised through subscription by the Government of the Republic of Poland of the PECS Charter in accordance with the procedures referred to in paragraph II.2 the Government of the Republic of Poland will, for the management of the programme, cover the Agency's internal costs, at a fixed rate of 7% of the yearly financial contribution covered by the Charter, progressively increased each year with the aim of reaching full costs after the five-year period of the PECS.
- II.4.2 The minimum financial contribution required for the participation of any ECS in the PECS over a period of five years amounts to 5 MEURO at 2001 economic conditions.
- II.4.3 Work may start as soon as one ECS has subscribed to the PECS Charter.
- II.4.4 The Government of the Republic of Poland may subsequently increase its contribution to the PECS once a year as long as such increase does not entail any additional cost to other ECS's.

- II.4.5 In the case of contracts co-financed by either the selected firm or other sources the participation in Agency's internal costs shall be calculated on the basis of the overall contract value, unless otherwise agreed.
- II.4.6 Notwithstanding the provisions of Article 18 of the Agency's Financial Regulations, any amount unspent at the end of the financial year shall be automatically carried forward to the following year.
- II.4.7 At the end of each five-year period covered by the PECS, the share of the Government of the Republic of Poland's contribution that has not been earmarked for the execution of the corresponding work shall be used to finance activities planned to be executed in the following five-year period covered by the PECS, unless otherwise required by the Government of the Republic of Poland.
- II.4.8 In the event of termination of the present Agreement, any contribution of the Government of the Republic of Poland not committed under the PECS may be assigned by the Government of the Republic of Poland to other Agency programme in which it participates if it becomes a Member State or an associate Member, or may be otherwise disposed of as decided by the Government of the Republic of Poland.

### *II.5 Contractual Matters*

- II.5.1 The Agency shall conclude the contracts necessary for the execution of the PECS in accordance with its rules and procedures, by applying the general clauses and conditions for ESA contracts and in particular all contracts shall be placed in EURO.
- II.5.2 Contractual commitments entered into by the Agency shall be limited to the funding available. The Agency shall not issue an invitation to tender when the funding for the activities concerned is insufficient in relation to the cost estimates in the work plan.

- II.5.3 Activities shall as a general rule be carried out through an open competition procedure in the ECS's that have expressed an interest in the activities concerned.
- II.5.4 In the case of co-funded activities the Agency shall retain full visibility over expenditure planned and actually incurred by the contractor as well as the origin of all funding for the purpose of the execution of the contract. Where appropriate this may include a right of audit by or on behalf of the Agency.
- II.5.5 Any intellectual property rights stemming from the in-orbit flight of a payload included in the activities of the PECS shall be governed by the Agency's Rules.

#### *II.6 Final Provisions*

- II.6.1 The Government of the Republic of Poland shall in principle, depending on the objectives of the cooperation project, be the owner of the assets produced and funded by it under the PECS as well as of the facilities, software and equipment acquired for its execution, while taking into account the principles governing Agency contracts.
- II.6.2 Amendments made to the present Appendix I shall require the Parties' written agreement.

## APPENDIX II

COMMITTEE OF THE PLAN FOR EUROPEAN COOPERATING STATES  
(PECS COMMITTEE)

## TERMS OF REFERENCE AND RULES OF PROCEDURE

*A. Terms of Reference*

The PECS Committee, acting in coordination with the Agency, shall monitor and control the execution of the PECS in accordance with the Objectives, Rules and Procedures set out in Appendix I to the present Agreement. To that end it shall:

1. examine and approve by a simple majority vote of the ECS's, after receiving notification of agreement by the relevant subordinate bodies of the Agency Council, the draft five-year PECS referred to in paragraph II.2 of the PECS Objectives, Rules and Procedures and any amendment thereof;

The right to vote on the draft five-year PECS shall also be granted to any other potential ECS's for which the relevant ECS Agreement has been signed but has not yet come into force.

2. decide, in conformity with Chapter V of the PECS Committee rules of procedures, on the language in which the meetings of the PECS Committee will be conducted, such decision to be taken by a simple majority vote of the ECS's;
3. take note of any subscriptions or any increase in contributions made by the participants to the PECS as reflected in the PECS Charter;
4. Receive information concerning the technical support provided by a national institution under the jurisdiction of a European Cooperating State referred to in the PECS Objectives, Rules and Procedures.
5. Approve its terms of reference and its rules of procedure and any amendments thereof.

## APPENDIX III

## PECS COMMITTEE

*B. Rules of Procedure*

## CHAPTER I

*Composition*

- 1.1 The PECS Committee shall be exclusively composed of representatives of ECS.
- 1.2 One representative of each Member State of the Agency may attend meetings of the Committee as observer. The Chairmen of the Administrative and Finance Committee (AFC), Industrial Policy Committee (IPC) and Science Programme Committee (SPC) of the Agency are invited to attend ex officio and are granted observer status.
- 1.3 Each ECS may in principle be represented by no more than two delegates. Participation as delegate shall be subject to submission to the Chairman of credentials issued by the competent national authority.
- 1.4 Advisers may accompany the delegates. The names and professions of advisers shall be notified to the Director General of the Agency before they take part in the work of any meeting of the Committee.

## CHAPTER II

*Chairmanship*

- 2.1 The Committee shall elect for one year from among the representatives of the ECS a Chairman and a Vice-chairman.
- 2.2 If the Chairman is unable to fulfil his or her functions the Vice-chairman shall take the Chair in his or her stead. The acting Chairman shall have the same powers and duties as the Chairman.

- 2.3 The Chairman shall conduct the Committee's deliberations. He or she shall not have the capacity of delegate. In the exercise of his or her functions the Chairman shall remain under the authority of the Committee.
- 2.4 The ECS of which a delegate exercises the functions of Chairman shall appoint a delegate in his or her stead for the duration of his or her functions as Chairman.

### CHAPTER III

#### *Meetings*

- 3.1 The Committee shall in principle meet on Agency premises, as a general rule not more than twice a year, immediately following a meeting of the IPC or AFC.
- 3.2 At the beginning of each meeting, the Chairman shall circulate a list of participants for signature.
- 3.3 Attendance of Representatives of Member States of the Agency and Chairmen of the AFC, IPC and SPC at meetings of the Committee shall in no way imply a right to vote.
- 3.4 The Committee shall at each meeting determine the date of its next meeting. When necessary the Chairman may alter the date fixed for a meeting.
- 3.5 The Chairman may convene extraordinary meetings of the Committee, either on his or her own initiative or on a request from a majority of ECS. He or she shall try to arrange such meetings in conjunction with meetings of the IPC or AFC.
- 3.6 The Director General of the Agency shall designate a member of the staff of the Agency to act as Secretary of the Committee.
- 3.7 After consultation with the Chairman, the Secretary of the Committee shall prepare a draft agenda, which shall be circulated to the ECS not later than a fortnight before each meeting.
- 3.8 The draft agenda shall be discussed and adopted by the Committee after any necessary modifications, immedi-

ately after the opening of the meeting. Other items may be added to the draft agenda but a decision may be taken on them only if all ECS present agree.

- 3.9 The staff members of the Agency designated by the Director General of the Agency shall attend meetings of the Committee.
- 3.10 Each ECS shall have one vote.
- 3.11 Except where otherwise provided for, decisions shall be taken by a simple majority of ECS represented and voting.
- 3.12 The present rules of procedure will be implemented with a view to facilitating the fulfilment of the objectives of the PECS and will become fully applicable when at least three ECS have joined the PECS Committee.

#### CHAPTER IV

##### *Functions of the Chairman and Conduct of Business*

- 4.1 The Chairman shall, subject to the provisions of these Rules, control the proceedings of the Committee and maintain order during its meetings. He or she shall declare the opening and closing of each meeting direct the discussions and, if necessary, sum them up, ensure observance of these Rules, accord or withdraw the right to speak, decide points of order, put proposals to the vote and announce decisions. He or she may propose adjournment or closure of the debate, or adjournment or suspension of a meeting. He or she shall ascertain before each vote that a quorum is present in accordance with paragraph 4.10 below.
- 4.2 No one shall take the floor without first having obtained the Chairman's authorisation. Subject to the provisions of paragraph 4.3, the Chairman shall call upon speakers in the order in which they have asked to speak. The Chairman may call to order a speaker whose remarks have no bearing on the subject at issue.
- 4.3 During the meeting, an ECS may move a point of order. The Chairman shall give an immediate ruling on this mo-

tion. Any ECS may appeal against the Chairman's ruling, in which case the appeal shall be debated and put to the vote. Unless the appeal is upheld by a majority of ECS present and voting, the Chairman's ruling shall stand. ECS speaking on a point of order may not deal with the substance of the point at issue.

- 4.4 Priority over all other propositions or motions shall be given, in the following order, to motions for:
  - a) Suspending the sitting,
  - b) Closing the sitting,
  - c) Adjourning the question under discussion,
  - d) Closure of the debate on the question under discussion.
- 4.5 Any proposal in its final form shall be put to the vote. It shall be submitted to the meeting in writing if an ECS so requests. In such case the Chairman shall not put the proposal to the meeting until ECS so desiring are in possession of the text of the proposal.
- 4.6 Whenever an amendment to a proposal is moved, the amendment shall be put to the vote first. If two or more amendments are moved the Committee shall vote first on the one which the Chairman rules to be in substance farthest from the original proposal. Where adoption of one amendment necessarily implies rejection of another amendment, the latter shall not be put to the vote.
- 4.7 Any ECS may request that parts of an amendment be put to the vote separately. If this request meets with objection, the motion to split the amendment shall be put to the vote.
- 4.8 If an ECS so requests, the Committee shall then vote on the final amended proposal.
- 4.9 Where two or more proposals are moved in respect of one and the same matter, these proposals shall, unless the Committee decides otherwise, be put to the vote in the order in which they were moved. After each vote the Committee may decide whether or not to vote on the next proposal.

- 4.10 Whenever the present rules become fully applicable pursuant the provisions of paragraph 3.12 above, the presence of representatives from a majority of ECS shall be necessary to constitute a quorum at any meeting of the PECS Committee.

#### CHAPTER V

##### *Languages*

The Committee's meetings shall be conducted in one of the working languages of the Agency, to be chosen by the PECS Committee. All documents for the meetings shall be prepared in the corresponding language.

#### CHAPTER VI

##### *Minutes*

- 6.1 After each meeting of the Committee draft minutes shall be prepared by the Committee Secretary, giving the substance of the discussions and recording the conclusions reached.
- 6.2 The draft minutes shall be circulated as soon as possible after the end of the meeting.
- 6.3 Proposals for amendments to the draft minutes shall be sent by the ECS to the Committee Secretary in writing within three weeks of the date of their communication.
- 6.4 At the beginning of each meeting the minutes of the previous meeting, after consideration of any amendment submitted, shall be approved by the Committee.

#### CHAPTER VII

##### *Amendments*

The terms of reference of the PECS Committee and its rules of procedure may be amended by the PECS Committee and shall require the Agency's written consent.

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<sup>1</sup> Macey L. Edmondson is a University of Mississippi School of Law, Law Library, public service librarian and legal research instructor.

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