

SATELLITE REMOTE SENSING: COMMERCIALIZATION OF REMOTE SENSING. IS THE USE OF SATELLITE DERIVED INFORMATION FOR MILITARY PURPOSES IN VIOLATION OF THE PEACEFUL PURPOSES PROVISION OF THE OUTER SPACE TREATY?

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I. INTRODUCTION

“Space offers the potential for practically limitless wealth, some already being exploited, some we may only harness in the distant future, and undoubtedly some we cannot begin to guess.”¹ On October 4, 1957, the first satellite, Sputnik, was launched to outer space.² On July 21, 1962, Neil Armstrong, an American astronaut, landed on the moon, this being the first time anyone had ever set foot in outer space.³ Ever since, humanity’s curiosity for

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1. Ezra J. Reinstein, *Owning Outer Space*, 20 NW. J. INT’L L. & BUS. 59 (1999).

2. National Aeronautics and Space Administration, Solar System Exploration, <http://solarsystem.nasa.gov/missions/profile.cfm?MCode=Sputnik> (last modified Jan. 28, 2004) (last visited Sept. 27, 2007).

3. National Aeronautics and Space Administration, Neil A. Armstrong Biographical Data, <http://www.jsc.nasa.gov/Bios/htmlbios/armstrong-na.html> (last modified Dec. 2003) (last visited Sept. 27, 2007).

the mysteries of outer space has increased exponentially. New technologies are constantly being developed to explore the potentials of outer space as well as the hidden mysteries of the earth. The international community, through the United Nations' (UN) Committee on Peaceful Uses of Outer Space (COPUOS) promulgated five treaties and principles aimed to regulate governmental and commercial activities in space.⁴ The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (also known as the Outer Space Treaty or OST) was opened for signature on January 27, 1967, entered into force on October 10, 1967 and as of January 1, 2007, ninety-eight countries have ratified it and twenty-seven have signed it.⁵ The second Treaty was The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (also known as the Rescue Agreement) which was entered into force on December 3, 1968 and as of January 1, 2007, it has eighty-nine ratifications and twenty-four signatures.⁶ Thirdly, the UN General Assembly adopted The Convention on International Liability for Damage Caused by Space Objects (known as the Liability Convention) which was entered into force on September 1, 1972, and as of January 1, 2007, it has eighty-four ratifications and twenty-four signatures.⁷ On September 15, 1976, the General Assembly entered into force the Convention on Registration of Objects Launched into Outer Space (also known as the Registration Convention) and as of January 1, 2007, it has forty-seven ratifications and four signatures.⁸ The last Treaty adopted by the General assembly was The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (known as the Moon Agreement) which was entered into force on July 11, 1984 and as of January 1, 2007, it has thirteen ratifications and four signatures.⁹ Ever

4. 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, 2410, 610 U.N.T.S. 215 [hereinafter Outer Space Treaty]; Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, 7 I.L.M. 151 [hereinafter Rescue Agreement]; Convention of International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [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]; Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 18, 1979, 1353 U.N.T.S. 3, 18 I.L.M. 1434 [hereinafter Moon Agreement]. See United Nations Treaties and Principles on Space Law, available at <http://www.unoosa.org/oosa/en/SpaceLaw/treaties.html> (last visited Sept. 27, 2007).

5. See Outer Space Treaty, *supra* note 4.

6. See Rescue Agreement, *supra* note 4.

7. See Liability Convention, *supra* note 4.

8. See Registration Convention, *supra* note 4.

9. See Moon Agreement, *supra* note 4.

since 1984, the United Nations has not adopted any other Treaties pertaining the exploration and use of Outer Space.

The international instruments that are most relevant when analyzing remote sensing activities are:

- 1) The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, known as the “Outer Space Treaty”;
- 2) The Convention on International Liability for Damage Caused by Space Objects, known as the “Liability Convention”; and
- 3) The United Nations General Assembly resolution adopting the Principles Relating to Remote Sensing of the Earth from Outer Space, known as Resolution 41/65.¹⁰

This Note is divided in five parts; the three main topics will be the Outer Space Treaty, remote sensing, and civil and military use of remotely sensed data. Part II focuses on the Outer Space Treaty: its history, the Principles controlling it, and an overview of some of its Articles, focusing on Article IV. Part II addresses the OST Article IV provision specifying that information obtained from out of space can only be used for “peaceful purposes”¹¹; it also looks at the different theories regarding “peaceful purposes” and whether the military use of information collected via remote sensing is in violation of the OST.

Part III is a brief overview of remote sensing. Part III. A discusses all the different definitions of remote sensing. Part III. B addresses remote sensing generally, including use, benefits, and laws controlling the distribution and use of remotely sensed data.

Part IV discusses the similarities between the civil and military use of remotely sensed data. Part IV. A addresses the growth in commercialization of remote sensing. Part IV. B discusses the inequality of access to information among Less Developed Countries, Developing and Developed Countries. Part IV. C focuses on the state’s responsibility to maintain national security while facing the dilemma of maintaining its citizens’ rights.

II. OUTER SPACE TREATY: PEACEFUL PURPOSES

The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial

10. Captain Michael R. Hoversten, *U.S. National Security and Government Regulation of Commercial Remote Sensing from Outer Space*, 50 A.F. L. REV. 253, 260 (2001). See also Outer Space Treaty, *supra* note 4; Liability Convention, *supra* note 4; Principles Relating to Remote Sensing of the Earth from Outer Space, G.A. Res. 41/65, U.N. Doc. A/Res/41/65, Dec. 3, 1986.

11. Outer Space Treaty, *supra* note 4, art. 4.

Bodies, most commonly known as the "Outer Space Treaty," provides the foundation for international legal order in outer space.¹² The OST establishes the international framework for the exploration and commercialization of space.¹³ It took effect on October 1967 and as of January 2006, ninety-eight countries have ratified and twenty-seven have signed the Outer Space Treaty of 1967.¹⁴ The Treaty is composed of seventeen articles.¹⁵ The first three articles establish the groundwork for the principles concerning the use and exploration of space.¹⁶ There are nine principles controlling the exploration and use of outer space:

- 1) The exploration and use of outer space shall be carried on for the benefit and in the interests of all mankind;
- 2) Outer space and celestial bodies are free for exploration and use by all States on a basis of equality and in accordance with international law;
- 3) Outer space and celestial bodies are not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means;
- 4) The activities of States in the exploration and use of outer space shall be carried on in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding;
- 5) States bear international responsibility for national activities in outer space, whether carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried on in conformity with the principles set forth in the present Declaration. The activities of non-governmental entities in outer space shall require authorization and continuing supervision by the State concerned. When activities are carried on in outer space by an international organization, responsibility for compliance with the principles

12. N. JASENTULIYANA, *A Survey of Space Law as Developed by the United Nations*, in PERSPECTIVES ON INTERNATIONAL LAW 349, 359 (Nandasiri Jasentuliyana ed., 1995). See also Major Christopher M. Petras, "Space Force Alpha: Military Use of International Space Station and the Concept of 'Peaceful Purposes,'" 53 A.F. L. REV. 135, 149 (2002).

13. Youseff Sneifer, 15443;15443 *The Implications of National Security Safeguards on the Commercialization of Remote Sensing Imagery*, 19 SEATTLE U. L. REV. 539, 548 (Spring 1996).

14. See Outer Space Treaty, *supra* note 4.

15. See United Nations Treaties and Principles on Outer Space, Text of Treaties and Principles Governing the Activities of States in the Exploration and Use of Outer Space, (2002), available at <http://www.unoosa.org/oosa/en/SpaceLaw/outerspt.html> (follow "PDF-E" hyperlink in "Title of Instrument" table) (last visited Aug. 1, 2007) [hereinafter U.N. Treaties and Principles on Outer Space].

16. JASENTULIYANA, *supra* note 12, at 359. See also Petras, *supra* note 12, at 150.

- set forth in this Declaration shall be borne by the international organization and by the States participating in it;
- 6) In the exploration and use of outer space, States shall be guided by the principle of cooperation and mutual assistance and shall conduct all their activities in outer space with due regard for the corresponding interests of other States. If a State has reason to believe that an outer space activity or experiment planned by it or its nationals would cause potentially harmful interference with activities of other States in the peaceful exploration and use of outer space, it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A State which has reason to believe that an outer space activity or experiment planned by another State would cause potentially harmful interference with activities in the peaceful exploration and use of outer space may request consultation concerning the activity or experiment;
 - 7) The State on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and any personnel thereon, while in outer space. Ownership of objects launched into outer space, and of their component parts, is not affected by their passage through outer space or by their return to the Earth. Such objects or component parts found beyond the limits of the State of registry shall be returned to that State, which shall furnish identifying data upon request prior to return;
 - 8) Each State which launches or procures the launching of an object into outer space, and each State from whose territory or facility an object is launched, is internationally liable for damage to a foreign State or to its natural or juridical persons by such object or its component parts on the Earth, in air space, or in outer space; and
 - 9) States shall regard astronauts as envoys of mankind in outer space, and shall render to them all possible assistance in the event of accident, distress, or emergency landing on the territory of a foreign State or on the high seas. Astronauts who make such a landing shall be safely and promptly returned to the State of registry of their space vehicle.¹⁷

Article I of the Outer Space Treaty refers to the common interest principle as well as the freedom principle, Article II addresses the nonappropriation principle, and Article III refers to the application of international law and the UN Charter to outer space.¹⁸ Article IV “contain[s] the first principles of

17. See Outer Space Treaty, *supra* note 4.

18. JASENTULIYANA, *supra* note 12, at 359. See also Petras, *supra* note 12, at 150.

international law explicitly relating to military activities in space.”¹⁹ Article IV provides in part that:

State Parties 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, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.

The moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military maneuvers on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited.²⁰

The first paragraph prioritizes the denuclearization of outer space; it prohibits the positioning of nuclear weapons and other weapons of mass destruction²¹ around the earth and “on celestial bodies.”²² It is implicit from this paragraph that other weapons are allowed in space.²³ Scholars are also prone to believe that the drafters intentionally left the Moon out of the wording of the Treaty implying that such weapons of mass destruction can be used on the Moon.²⁴ However, there is no clear evidence of whether nuclear weapons

19. I.A. VLASIC, *Space Law and the Military Applications of Space Technology*, in PERSPECTIVES ON INTERNATIONAL LAW 385, 396 (Nandasiri Jasentuliyana ed., 1995). See also Petras, *supra* note 12, at 157.

20. Outer Space Treaty, *supra* note 4, art. 4.

21. “Weapons of mass destruction” is generally accepted to include nuclear, chemical and biological weapons. See W.T. Mallison, Jr., *The Laws of War and the Juridical Control of Weapons of Mass Destruction in General and Limited Wars*, 36 GEO. WASH. L. REV. 308, 326 (1967). See also Robert L. Bridge, *International Law and Military Activities in Outer Space*, 13 AKRON L. REV. 649, 656 (1980); Major Douglas S. Anderson Judge Advocate, United States Air Force, *A Military Look into Space: The Ultimate High Ground*, 1995 ARMY LAW. 19, 24 (Nov. 1995).

22. Outer Space Treaty, *supra* note 4, art. 4, ¶ 1.

23. NICHOLAS DEB. KATZENBACH, *The Law in Outer Space*, in SPACE: ITS IMPACT ON MAN AND SOCIETY 69, 75, (Lillian Levy, 1965). See also CENTRE FOR RESEARCH OF AIR & SPACE LAW, SPACE ACTIVITIES AND EMERGING INTERNATIONAL LAW 270, 292 (Nicolas M. Matte ed., 1984); Petras, *supra* note 12, at 157–58.

24. NANDASIRI. JASENTULIYANA, *The Moon Treaty*, in MAINTAINING OUTER SPACE FOR PEACEFUL USES 121, 126 (Nandasiri Jasentuliyana ed. 1984). See also Petras, *supra* note 12, at 158.

or weapons of mass destruction are banned from the Moon as well as from the rest of outer space.²⁵

The second paragraph of the Treaty is also a common source for debate and interpretation due to its vagueness with respect to what the drafters meant by “peaceful purposes” and to which areas of space they intended it to apply. The second paragraph of Article IV provides for two different issues: what areas of space did the drafters intend “peaceful purposes” apply to and what did the drafters mean by “peaceful purposes?”

There are two major schools of thought with respect to the extent to which “peaceful purposes” should apply; there is a strictly construed view that the term allows certain military activity in some regions of outer space and there is a more broad interpretation that suggests that the drafters intended for “peaceful purposes” to apply to all of outer space.²⁶ The first theory proposes that by specifying “the moon and other celestial bodies”²⁷ shall be used “exclusively for peaceful purposes”,²⁸ the drafters intentionally omitted “outer space”²⁹ to allow the states to use certain areas of space for military purposes.³⁰ Followers of the second theory look at other clauses of the Outer Space Treaty, mainly the Preamble and Articles IX and XI, as well as other documents such as the UN General Assembly resolutions and the UN Charter to conclude that “all ‘outer space’ must be used for peaceful purposes.”³¹ This view focuses on the language of the nine principles controlling the use and exploration of outer space:

- 1) [B]enefit and interest of all mankind [Principle 1];
- 2) [I]n accordance to international laws [Principle 2];
- 3) [M]aintaining international peace and security [Principle 4];
- 4) [P]romoting international cooperation [Principle 4]; and
- 5) [W]ith due regard for the corresponding interests of other States [Principle 6].³²

25. Petras, *supra* note 12, at 158.

26. *Id.* at 160.

27. Outer Space Treaty, *supra* note 4, art. 4, para. 2.

28. *Id.*

29. *Id.*

30. G.S. RAJU, *Military Use of Outer Space: Toward Better Legal Controls*, in MAINTAINING OUTER SPACE FOR PEACEFUL USES 90, 91 (N. Jasentuliyana ed. 1984). See also CARL Q. CHRISTOL, *THE MODERN INTERNATIONAL LAW OF OUTER SPACE* 24–25 (1982); Petras, *supra* note 12, at 160.

31. Robert L. Bridge, *International Law and Military Activities in Outer Space*, 13 AKRON L. REV. 649, 658 (1980). See also Richard A. Morgan, *Military Use of Commercial Communication Satellites: A New Look at the Outer Space Treaty and Peaceful Purposes*, 60 J. AIR L. & COM. 237, 302 (1994); Petras, *supra* note 12, at 160.

32. See United Nations Treaties and Principles on Outer Space, *supra* note 15, at 4.

This theory would support the conclusion that current international law requires all of outer space to be used for "peaceful purposes" based on the constant technological developments and its wide availability.³³

The framers' intended meaning of "peaceful purposes" has also been troubling scholars for several years; they have created numerous definitions ranging from the idea that all uses of the satellites for military purposes is nonpeaceful, hence in violation of the Treaty.³⁴ A different view sees "peaceful purposes" as prohibiting only the aggressive use of the satellites rather than completely banning their military use.³⁵ The idea that "peaceful purposes" prohibits the military use of space is founded on the history of the Treaty itself.³⁶ The provision referring to "peaceful purposes" in the Outer Space Treaty was adapted from the 1959 Antarctic Treaty, which stated in part that, "Antarctica shall be used for peaceful purposes only. There shall be prohibited, inter alia, any measures of a military nature, such as the establishment of military bases and fortifications, the carrying out of military maneuvers, as well as the testing of any type of weapons."³⁷

Since the main purpose of the Antarctic Treaty was the demilitarization of the Antarctic, it is commonly referred to by followers of the view that "peaceful purposes" can be equated with non-military.³⁸ However, such a strictly construed interpretation of the Outer Space Treaty has not been followed by the states ever since the treaty's adoption.³⁹ Furthermore, by the time the Treaty was signed in 1967, the two primary drafters of the Treaty, United States (US) and the former Soviet Union, were already using outer space for military purposes.⁴⁰ After the launching of Sputnik in 1957, states realized that reconnaissance satellites would start to become widely available and therefore, a general consensus has since emerged within the UN that peaceful is more a synonym of non-aggressive rather than of nonmilitary.⁴¹

Further, the UN Charter recognizes some military actions as being non-aggressive; such actions are those pursuant to a UN Security Council

33. Morgan, *supra* note 31, at 241.

34. *Id.*

35. *Id.*

36. See Petras, *supra* note 12, at 168.

37. See Petras, *supra* note 12, at 168 (quoting Antarctic Treaty, Dec. 1, 1959, 12 U.S.T. 794, 402 U.N.T.S. 72, 1959 U.S.T. LEXIS 420).

38. Petras, *supra* note 12, at 169-70.

39. *Id.*

40. Anderson, *supra* note 21, at 25.

41. Walter D. Reed & Robert W. Norris, *Military Use of the Space Shuttle*, 13 AKRON L. REV. 665, 678 (1980). See also Morgan, *supra* note 31, at 303. See also Petras, *supra* note 12, at 171.

Resolution or if the action is done in self defense.⁴² It is usually argued that if such actions are not in violation of the UN Charter, they are therefore in compliance with the “peaceful purpose” provision of the Outer Space Treaty.⁴³

III. REMOTE SENSING

Remote Sensing technology emerged around the late 1950s and early 1960s. Its original purpose was for meteorology and military reconnaissance; it is mainly used to take measurements of objects from a distance.⁴⁴ Since 1972, when the US launched the first remote sensing satellite, other countries have also developed their own remote sensing systems.⁴⁵

A. Definitions of Remote Sensing

Before 1986, when the UN General Assembly adopted Resolution 41/65, there were several definitions for remote sensing. Overall, their content is very similar with slight variations:

- a) The United States House of Representative's Committee on Science and Astronautics defined remote sensing as “the acquisition of information about specific objects or phenomena in which the information gathering device is not in intimate contact with the subject under investigation.” This is a broad definition which could even include X-ray medical examinations or radar-directed shipping movements;
- b) The United Nations Committee on Permanent Uses in Outer Space at its 1973 second session stated that “remote-sensing of the earth from outer space is defined as a methodology to assist in characterizing the nature and/or condition of features or phenomena on, above or below the earth's surface by means of observation and measurements from space platform . . . at present, such methods depend upon the emission and reflection of electromagnetic radiations.” This is a much more functional

42. Anderson, *supra* note 21, at 27.

43. *Id.* at 27–28.

44. Jean-Louis Magdelénat, *The Major Issues in the “Agreed” Principles on Remote Sensing*, 9 J. SPACE L. 111 (1981). See also Jefferson Hane Weaver, *Lessons in Multilateral Negotiations: Creating a Remote Sensing Regime*, 7 TEMP. INT’L & COMP. L.J. 29, 31 (1993).

45. Committee on the Peaceful Uses of Outer Space, *Report of the Scientific and Technical Subcommittee on the Work of Its Twenty-Fifth Session*, 13, ¶ 56, U.N. Doc A/AC.105/409 (1988). See also David A. Greenburg, *Third Party Access to Data Obtained via Remote Sensing: International Legal Theory versus Economic and Political Reality*, 15 CASE W. RES. J. INT’L L. 361, 362 (1983); J. Richard West, *Copyright Protection For Data Obtained By Remote Sensing: How The Data Enhancement Industry Will Ensure Access For Developing Countries*, 11 NW. J. INT’L L. & BUS. 403, 404 (1990).

- definition which is aimed at describing a specific space operation;
- c) At the Agricultural University of Wageningen in the Netherlands, S. Hempenius stated in 1978 that remote-sensing "consists of collecting data concerning objects, materials and situations on the earth by means of sensors mounted into fast-moving crafts on land, at sea, in the air and in space, and processing such data for quantification, qualification and mapping purposes." This is a functional definition that also embraces the functions of monitoring and of data-processing;
 - d) At UNISPACE 1982, it was stated that remote-sensing 'refers to the detection and analysis of resources on earth by sensors carried by aircraft and spacecraft.' This is a concise definition which seems to place its value upon the use of 'sensors'.⁴⁶

Finally, the 1986 UN General Assembly Resolution 41/65, which is the only Resolution that provides guidance with respect to the use and meaning of remote sensing, defined remote sensing by satellite as "the sensing of the Earth's surface from space by making use of the properties of electromagnetic waves emitted, reflected or diffracted by the sensed objects, for the purpose of improving natural resources management, land use and the protection of the environment."⁴⁷ Regardless of these definitions, it is easier to think of remote sensing as observations occurring without physical contact with the target under surveillance and from a location considered to belong to outer space.⁴⁸ Remote sensing can also be defined as "[including] the monitoring, processing, storing, value-adding and disseminating of data as being integral parts of the whole remote sensing process."⁴⁹

B. Remote Sensing in General

Remote sensing is done by using satellites orbiting the earth to obtain a "large scale picture and repetitive view of the surface of the earth, thereby making it possible to monitor changes in the earth environment without interruption through all the seasons and in almost any conditions all year round."⁵⁰ Scientists divide remote sensing in two categories: passive remote

46. Patrick A. Salin, *Proprietary Aspects of Commercial Remote-Sensing Imagery*, 13 NW. J. INT'L L. & BUS. 349, 352. (1992).

47. Principles Relating to Remote Sensing of the Earth from Outer Space, G.A. Res. 41/65, U.N. Doc. A/Res/41/65, Annex 1(a), Dec. 3, 1986.

48. Salin, *supra* note 46.

49. *Id.*

50. Detlev Vagts & Ivan A. Vlasic, *Charles C. Okolie's International Law of Satellite Remote Sensing and Outer Space*, 86 AM. J. INT'L L. 221, 221 (1992) (book review).

sensing and active remote sensing.⁵¹ Passive remote sensing is done by reading electromagnetic radiation emitted by an object. On the other hand, active remote sensing is done by “first transmitting electromagnetic radiation down to the object and then reading the reflected energy.”⁵² Quality of the images is determined by how good the resolution of the area remotely sensed is.⁵³ The resolution capabilities of the sensors are generally measured in meters and it defines the smallest object that could be detected by satellite sensors.⁵⁴ Currently, some remote sensing satellites can detect images of a couple of feet.⁵⁵ Resolution is also dependent on the altitude of the orbit; lower altitudes provides for a narrower span of vision but a better resolution.⁵⁶ Military and reconnaissance satellites need a narrow vision. However, this diminishes the value of the images for commercial use.⁵⁷ Remote sensing images are currently available in multispectral color readings; these images are able to differentiate specific colors, and shots from different angles provide three dimensional viewing.⁵⁸

Remote sensing offers an extensive variety of possible uses including air and water pollution surveys, ocean fishing surveys, and land use planning.⁵⁹ Data acquired from the satellites have helped in the location of subsurface supplies of water, examination of land features to locate mineral resources and in enhancing civil engineering and coastal zone management.⁶⁰ Besides being used for environmental purposes, remote sensing can also serve military purposes such as the reconnaissance and verification of compliance with arms control treaties.⁶¹ Remote sensing technology was at first only used by the military and intelligence forces of the major world powers.⁶² It was not until 1972, when the Americans launched the U.S. Earth Resources Technology

51. Weaver, *supra* note 44, at 32.

52. *Id.*

53. “Resolution” has different meanings according to the technology used. Sneifer, *supra* note 13, at 548.

54. Cynthia M. Hayward, *Remote Sensing: Terrestrial Laws for Celestial Activities*, 8 B.U. INT’L L.J. 157, 162 (1990).

55. T. A. Heppenheimer, *Operational Remote Sensing Satellites*, http://www.centennialofflight.gov/essay/SPACEFLIGHT/remote_sensing/SP36.htm (last visited Aug. 1, 2007).

56. Sneifer, *supra* note 13, at 543.

57. *Id.* at 544.

58. Susan M. Jackson, *Cultural Lag and the International Law of Remote Sensing*, 23 BROOK. J. INT’L L. 853, 858 (1998).

59. Weaver, *supra* note 44, at 33.

60. *Id.*

61. Hoversten, *supra* note 10, at 258.

62. *Id.* at 253.

Satellite (ERTS) that the remotely sensed imagery became commercialized.⁶³ After the launch of ERTS, a chain of events occurred where many countries started to launch their own satellites and the availability of remotely sensed imagery became even more widely accessible commercially.⁶⁴

Around 1973, the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space (COPOUS) started working on the formulation of rules to govern the conduct of remote sensing, but it was not until many years after that the committee approved fifteen principles in an attempt to control the use of remote sensing activities.⁶⁵ Principle III of the UN General Assembly Resolution 41/65 provides that:

Remote sensing activities shall be conducted in accordance with international law, including the Charter of the United Nations, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and the relevant instruments of the International Telecommunication Union.⁶⁶

This principle clearly states that remote sensing activities shall comply with the requirements of the aforementioned treaties and laws.⁶⁷ Since remote sensing activities refers to the interpretation and dissemination of the remotely sensed data, two questions arise: whether the distribution of imagery from space remote sensing activities has to comply also with the “peaceful purposes” provision of the Outer Space Treaty and whether the use of such imagery for military purposes is also a violation of the nonmilitary provision of the Treaty. An attempt to answer these questions would be unfruitful since there is no clear definition of what the drafters meant by “peaceful purposes.” Remote sensing images used for news gathering, which can be characterized as being peaceful in nature, could trigger a non-peaceful event if the images shown are analyzed by the wrong people. Further, the commercialization of remote sensing images has made it almost impossible to control who uses what and where. Even if the states were able to control the primary dissemination of the images, for

63. *Id.*

64. *Id.*

65. Jackson, *supra* note 58, at 870.

66. Principles Relating to Remote Sensing of the Earth from Outer Space, G.A. Res. 41/65, U.N. Doc. A/Res/41/65, Annex 1(a), Dec. 3, 1986.

67. The term “remote sensing activities” means the operation of remote sensing space systems, primary data collection and storage stations, and activities in processing, interpreting and disseminating the processed data. Principles Relating to Remote Sensing of the Earth from Outer Space, G.A. Res. 41/65, U.N. Doc. A/Res/41/65, Annex 1(a), Dec. 3, 1986.

example, prohibiting the distribution for military purposes, there is no feasible way to control to whom they are sold after their primary purchase.⁶⁸

In 1992, U.S. Congress passed Section 5621 of the Land Remote Sensing Policy Act which authorizes the Secretary of Commerce to issue licenses for private space-based remote sensing systems.⁶⁹ The Act defines land remote sensing as “the collection of data which can be processed into imagery of surface features of the earth from [a] . . . satellite. . . .”⁷⁰ Private companies began to sell high resolution images of the earth and its resources taken with remote sensing technology.⁷¹ In March 1994, the Clinton Administration pronounced a policy allowing extended sales of images obtained from remote sensing systems.⁷² The purpose of this policy is to allow US companies more liberty to sell remote sensing images in the international market.⁷³ Under the policy, companies have to request a license from the Secretary of Commerce to operate remote sensing systems and make them available in domestic and foreign market.⁷⁴ The commercialization of such data can be of significant help to many countries’ military strategies, considering that in order to obtain the same information, such countries would have had to spend considerable amount of money and resources required to produce and operate the space-based remote sensing systems.⁷⁵

IV. CIVIL AND MILITARY USE OF REMOTELY SENSED DATA

Currently, the potential commercialization of remote sensing is limitless. Today, almost all advances in remote sensing technology have civil and military applications since at its beginnings remote sensing was primarily used as reconnaissance satellites for the military.⁷⁶ Remote sensing technology is still generally used for agricultural and environmental studies, terrain mapping, and a new market for remote sensed imagery is being developed in the real estate market where companies are offering photographs of homes, neighborhoods

68. Jackson, *supra* note 58, at 878.

69. Land Remote Sensing Policy Act, 15 U.S.C. § 5621 (1992) available at <http://geo.arc.nasa.gov/sge/landsat/15USCch82.html> (last visited Aug. 1, 2007).

70. Land Remote Sensing Policy Act, 15 U.S.C. § 5602 (1992) available at <http://geo.arc.nasa.gov/sge/landsat/15USCch82.html> (last visited Aug. 1, 2007).

71. Hoversten, *supra* note 10, at 254.

72. “The fundamental goal of [the] policy is to support and to enhance US industrial competitiveness in the field of remote sensing . . . while at the same time protecting US national security and foreign policy interests.” Sneifer, *supra* note 13, at 558.

73. *Id.*

74. *Id.*

75. Hoversten, *supra* note 10, at 254.

76. *Id.* at 253.

and traffic patterns taken from space.⁷⁷ Currently, individuals can even use their home computers to view high resolution imagery of certain places. In addition, it can be argued that any photograph of the earth taken from space can be used for both civilian and military purposes. Further, communication satellites used to transport communication for civilian purposes can also be used to transport military communications in times of wars.⁷⁸ And since it has been established that states cannot prohibit the placement of remote sensing satellites in space that will take images of their territory, all remotely sensed images are up for grabs, whether it is by the military, an individual, or a private corporation.⁷⁹

A. Commercialization of Remote Sensing

The commercialization of remote sensing imagery has created a great division of views. Some think that dissemination of remotely sensed data will benefit everyone by reducing the tension caused by the search for information; others disagree and affirm that distribution of that data will not be obtained asymmetrically by less developed, developing, and developed countries.⁸⁰ The first view sustains the idea that commercial dissemination will hinder the states' capabilities to secrete their military potential and any nuclear, biological, or chemical production factories they might have, therefore, discouraging such countries from having these facilities.⁸¹ In contrast, supporters of the second theory fear that the advances in technology plus the commercial distribution of remotely sensed high resolution images will nourish international competition and cause nations to attempt to destroy each other's military defenses.⁸²

Further, commercial dissemination of remote sensing imagery can increase the opportunities available for terrorist groups to come across valuable information that could be used against a country, especially in these days that the use of the internet is a common occurrence and digital images can be downloaded from the convenience of your own home.⁸³ Significantly, commercialization of remotely sensed data has demonstrated that nations will never be safe and they will always face a threat either from their own citizens or from other nations.

77. Jackson, *supra* note 58, at 856–57.

78. Anderson, *supra* note 21, at 27.

79. The Outer Space Treaty of 1967 provides that outer space is “not subject to national appropriation by claim of sovereignty.” Outer Space Treaty, *supra* note 4, art 2.

80. Jackson, *supra* note 58, at 876.

81. *Id.* at 877.

82. *Id.*

83. *Id.* at 878.

B. Commercialization and Less-Developed Countries

Even though remotely sensed data has been commercialized and it is at the disposal of whoever wants to buy it, less developed countries (LDCs) feel at a constant disadvantage compared to developing and developed countries and private foreign companies.⁸⁴ LDCs also face a great disparity in accessing the information. Even though most of the data is commercially available, there is some data that cannot be accessed in the market and these countries do not have the necessary resources to implement a remote sensing system of their own.⁸⁵ Further, there are also debates “in the international forum about the legality of one nation’s right to collect and disseminate remotely sensed data concerning another nation.”⁸⁶ Nations do not have the right to prohibit remote sensing systems to take images of their territory.⁸⁷ Even though this seems to even out the playing field, it is a disadvantage to LDCs because their natural resources, military bases, and defenses are out in the open for everyone to see. Conversely, LDCs do not have access to the most precious secrets of other nations, neither do they have the resources to buy the data from their own territories to prevent it from being disseminated.

These inequalities raise a concern when analyzing the main principles of the Outer Space Treaty; “Outer Space shall be the province of all mankind.”⁸⁸ If the drafters really meant for the space resources to be enjoyed by every nation equally, would the UN be failing its mission of promoting peace and equality among nations? Principle VIII and IV of the General Assembly Resolution 41/65 state respectively:

Principle VIII

The United Nations and the relevant agencies within the United Nations system shall promote international co-operation, including technical assistance and co-ordination in the area of remote sensing.

Principle IV

Remote sensing activities shall be conducted in accordance with the principles contained in article I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, which, in particular provides that the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries, irrespective of

84. Hayward, *supra* note 54, at 164.

85. Such resources can include among others, technology, training of staff, technicians, and financial resources as well. *Id.*

86. Jackson, *supra* note 58, at 855.

87. Outer Space Treaty, *supra* note 4, art. 2.

88. *Id.* art 1.

their degree of economic or scientific development, and stipulates the principle of freedom of exploration and use of outer space on the basis of equality. These activities shall be conducted on the basis of respect for the principle of full and permanent sovereignty of all States and peoples over their own wealth and natural resources, with due regard to the rights and interests, in accordance with international law, of other States and entities under their jurisdiction. Such activities shall not be conducted in a manner detrimental to the legitimate rights and interests of the sensed State.⁸⁹

Notwithstanding the countries' agreement to follow the Principles stipulated in this Resolution, there is still a lot of work remaining for the UN as a peacekeeper organization.

C. States' Responsibility With Respect to Civilian Use of Remotely Sensed Data

"The quest for international cooperation in the peaceful use of outer space must not jeopardize national defense responsibilities."⁹⁰

In spite of all the interpretations and efforts to demilitarize outer space, military use and exploration of space has been occurring since the beginning—even before the Outer Space Treaty took effect in 1967—and it does not seem to be heading towards an end.⁹¹ Rather than figuring out how to completely ban military use of space and the data obtained from remote sensing, states should also direct their attention to civilian use of remotely sensed data. Since remote sensing data became commercially available, individuals have been able to acquire any sort of images and data obtained from remote sensing systems. Commercialization of remote sensing poses more of a threat to the countries than militarization of space. States are in a constant fight to provide their citizens with the tranquility that their rights will not be violated. However, individuals might not be able to assimilate the responsibility that comes with access to endless amount of information. The use of remotely sensed data by the wrong people can be a problem of national security. Do the countries have a higher duty to protect its citizens rights or its citizens well being?

Freedom of information and expression are not only recognized in the US, they are universal rights recognized internationally.⁹² The UN Charter

89. G.A. Res. 41/65, *supra* note 10, Annex 1(a).

90. Anderson, *supra* note 21, at 29.

91. Glenn Harlan Reynolds, *Symposium, Issues in Space Law: International Space Law in Transformation: Some Observations*, 6 CHI. J. INT'L L. 69, 71 (2005).

92. Article 19 states that everyone "has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive, and to impart information and

expressly proclaims that one of the purposes of the U.N is to promote and encourage human rights.⁹³ However, the UN also promotes international peace. Nevertheless, there is often a conflict between maintaining peace and individuals' rights.⁹⁴ How can the states limit the dissemination of remotely sensed images of their military bases and operations? Generally, countries cannot prohibit the dissemination of remotely sensed imageries of their territories.⁹⁵ However, they could implement restrictions that would only be binding on their own companies; such restrictions can include limits on the sale of remotely sensed data.⁹⁶ Assuming states are successful in taking these actions, there is no guarantee that they will be successful that secondary dissemination will not occur. After a national company sells the information, the remotely sensed data is back in the market and there is no piece of law that restricts the dissemination of remotely sensed imagery.

V. CONCLUSION

The advances in technology have exceeded everyone's expectations and the laws controlling the use and exploration of outer space are therefore falling behind. Scholars have not been able to determine what the drafters of the Outer Space Treaty meant by "peaceful purposes," neither have they been able to find whether military use of remotely sensed data is in violation of the Treaty. However, regardless of all the scholarly analysis of these issues, it all boils down to the stake that countries and organizations have in the peaceful use of outer space; the higher this stake is, the more they will help preclude aggressive military use of space.⁹⁷ States will always face the dilemma of maintaining the freedom of speech and expression of their citizens. On the other hand, they also have to protect their national security and maintain the country's welfare.

States' first and foremost duty should be to protect its citizens by any means necessary. Technology is a double edge sword. On one side, it provides incredible benefits for the country and its individuals, and on the other it exposes the countries' greatest weaknesses making them vulnerable to their enemies. As of right now, the laws controlling the commercialization and use of remotely sensed data do not match the advances in technology, leaving very important areas uncovered and facilitating the circumvention of these laws. For

ideas through any media and regardless of frontiers." Universal Declaration of Human Rights, G.A. Res. 217A, at 71, U.N. GAOR, 3d Sess., 1st plen. Mtg., U.N. Doc A/810 (Dec. 12, 1948) available at <http://www1.umn.edu/humanrts/instrree/b1udhr.htm> (last visited Aug. 1, 2007).

93. U.N. Charter, art. 1, ¶ 3.

94. *Id.* ¶ 1.

95. Outer Space Treaty, *supra* note 4, art. 2.

96. Sneifer, *supra* note 13, at 571.

97. Reynolds, *supra* note 91, at 71.

example, there is no specific law regulating the sale of remotely sensed imagery and even if nations are successful in regulating their own companies they have no means to control secondary dissemination of remotely sensed data.

It seems that with the commercialization of remote sensing we are achieving the main purpose of these Treaties and Resolutions; in other words, that outer space should be equally accessible for all mankind.⁹⁸ However, one can not help to wonder: are nations encouraging commercialization because they believe in the core principles of the Treaties or because it is in their best interest to be able to obtain military and civilian information on their enemies and biggest competitors? Regardless of the individual reasons of the states, we as citizens have to be aware that those with the economic resources to obtain remotely sensed imagery will not always have the best of intentions, and it is the author's opinion that it will be violating the "peaceful purposes" provision of the Outer Space Treaty.

98. Outer Space Treaty, *supra* note 10, art 1.