COMMENTS

STEMMING THE ARMS RACE IN OUTER SPACE: SUGGESTED REVISIONS OF THE OUTER SPACE TREATY BASED ON THREE SUCCESSFUL ARMS CONTROL MEASURES

In today's nuclear age, technology has provided the ability to destroy civilization as we know it.[1] In spite of this threat, annual worldwide military expenditures have catapulted from $400 billion in 1979[2] to $600 billion in 1982[3] and were expected to reach $800 billion by the end of 1983.[4] This rapid acceleration in military spending, leaves little reason for optimism regarding disarmament in the 1980's.[5] Now, military expansion is even pervading man's use of outer space.

The competitiveness exhibited by spiraling military budgets on earth has been paralleled by man's expansion into outer space. This acute sense of competition is illustrated very well by what has been termed the space race.[6] Within one year after the Soviet Union surprised the world by the 1957 launching of Sputnik I,[7] the United States increased its space related research and development budget

1. *The World After Nuclear War: Findings of the Washington Conference on the Long-Term Worldwide Biological Consequences of Nuclear War*, 7 DISARMAMENT 8, 12, U.N. Doc. ST/PSCA/D58 (Spring 1984). In the aftermath of a 5,000 megaton nuclear exchange (medium size exchange), survivors would face extreme cold, water shortages, lack of food and fuel, heavy burden of radiation and pollutants, diseases, and severe psychological stress—all this in twilight or darkness caused by smoke from fires and fire storms.

2. U.N. Dept. of Public Information, *Disarmament Fact Sheet No. 9*, U.N. Doc. ST/PSCA/D59/9, at 10 (1979). Also, since World War II, direct costs of the arms race had exceeded six trillion dollars as of 1979. This is equivalent to the combined gross national product of the entire world for 1975.

3. U.N. Department for Disarmament Affairs, *Disarmament Fact Sheet No. 26*, U.N. Doc. ST/PSCA/D59/26, at 1 (1982).

4. *The Prospects for Disarmament in the 1980's: Disarmament Week Forum*, 7 DISARMAMENT 16, U.N. Doc. ST/PSCA/D58 (Spring 1984).

5. *Id.*

6. *See generally* Lovell, *The Great Competition in Space*, 51 FOREIGN AFF. 124 (1972). Sir Bernard Lovell presents an interesting and enlightening reflection on the economic and political motivations underlying space competiton between the U.S. and U.S.S.R.

7. *Id.* at 127.

from $6.5 billion to $10.5 billion.[8] During the next ten years, this research and development budget was tripled by the United States and was increased five times by the Soviet Union.[9] This new frontier of competition between the Soviet Union and the United States resulted in NASA's budget being increased from $150 million in 1959 to $5.5 billion in 1966.[10] This rush has resulted in the launching of a formidable collection of statellites and other pieces of equipment into space.[11]

Military satellites perform a variety of functions including navigation, communication, meteorology and geodesy.[12] While seventy-five percent of all satellites serve a military function,[13] outer space has remained almost free of weaponry.[14] One exception to the non-aggressive character of previous satellites is the Soviet anti-satellite interceptor (ASAT) which they began testing in 1967.[15] Although the Soviets have never publicly admitted testing these "killer satellites," United States sources claim that sixteen ASAT tests were conducted by the Soviet Union between October 1968 and April 1980.[16] This "secretive" deployment of ASATs marked the first real threat of an arms race in outer space. The United States is also involved in ASAT development but has not deployed any of these weapons in

8. *Id.* This constitutes a dramatic increase of one percent of the gross national product.

9. *Id.* at 128.

10. *Id.* at 129. Although considered technologically behind the Soviet Union in space exploration in the decade following the launching of Sputnik I, the United states, through these dramatic budget increases, was able to stage a *coupe de grace* by landing astronauts Armstrong and Aldrin on the lunar surface on July 20, 1969.

11. As of April 1982, the United States had 425 near earth satellites and 30 space probes. The Soviet Union had 642 near earth satellites and 25 outer space probes. Also, the United States had 2,185 pieces of space debris (junk) and 44 pieces of space probe debris while Russia had 1,127 pieces of debris and 111 pieces of space probe debris. The total for all 18 nations involved in space exploration was 4,651 at that date. Finch, *Law and Security in Outer Space: Implications for Private Enterprise*, 11 J. SPACE L. 107, 108 (1983).

12. Jasani, *Outer Space: A New Dimension to Warfare?* 4 DISARMAMENT 13, U.N. Doc. ST/PSCA/D58 (Spring 1984). Geodesy is a branch of applied mathematics that determines the exact positions of points and the figures and areas of large portions of the surface of the earth, the size and shape of the earth, and variations of terrestrial gravity and magnetism. WEBSTER'S THIRD NEW INT'L DICTIONARY OF THE ENGLISH LANGUAGE 948 (1971).

13. Jasani, *supra* note 12, at 13. Military function as used here means that a satellite performs a service which is either necessary or beneficial to a military organization.

14. Goedhuis, *Some Observations on the Efforts to Prevent a Military Escalation in Outer Space*, 10 J. SPACE L. 13 (1982).

15. Jasani, *supra* note 12, at 18. The Soviet ASAT is a device which is maneuvered adjacent to the target satellite, then detonated destroying the target with shrapnel.

16. Vlasic, *Disarmament Decade, Outer Space and International Law*, 26 MCGILL L.J. 136, 158 (1981). Ten of these tests were judged by American analysts as successes, although no spokesman has asserted that any of the U.S.S.R.'s own targets were actually destroyed nor that any U.S. satellites were interfered with.

outer space.[17]

While these devices are non-nuclear,[18] their development has led to a keen awareness of the dangers of a military escalation in space.[19] Negotiations to ban or limit ASAT weapons have been fruitless.[20] The threat to peaceful uses of outer space has been dramatically intensified by President Reagan's plan to develop anti-ballistic missile weaponry designed to operate from earth orbit.[21] The new weaponry would be based on the technology of lasers, particle beams and "rail guns."[22] While some scientists have expressed doubts about the technology,[23] the message seems clear: we are about to witness the dawn of an unprecedented arms race in space.

This Comment is devoted to a discussion of the 1967 Outer Space Treaty.[24] The discussion will include an examination of its peaceful purpose, different interpretations of this purpose, along with the goals and intentions of the two major parties in formulating the Treaty. Following the discussion of this peaceful purpose, the Treaty's arms control capacity will be analyzed. Next, a survey of three successful arms limitation agreements will be made to ascertain the language of certain provisions which have enabled these treaties

17. Goedhuis, *supra* note 14, at 18, 19. One United States system launched from a high speed, high flying aircraft, would intercept the target using an infrared homing device, and would explode and destroy the target. The second device is a non-explosive, maneuverable vehicle with an infrared sensor which would ram and destroy the target after guiding itself from its own orbit. A third system is similar to that of the Soviet Union's where an orbital device is guided to its target from earth and when in close proximity is detonated causing the destruction of the other satellite by shrapnel from the explosion.

18. *See* Finch, *supra* note 11, at 108. "Non-nuclear" means these weapons use conventional explosives.

19. Jasani, *supra* note 12.

20. *Report of the Committee on Disarmament*, 37 U.N. GAOR Supp. (No. 27) at 103, U.N. Doc. A/37/27 (1983).

21. N.Y. Times, Mar. 24, 1983, at 1, col. 6.

22. *Space-War Era, It's Already Here*, U.S. NEWS & WORLD REP., Dec. 17, 1984, at 28 [hereinafter cited as *Space-War Era*]. For a discussion of lasers and particle beams, *see* Robinson, *Beam Weapon Advances Emerge*, AVIATION WEEK & SPACE TECH., July 18, 1984, at 18. Lasers depend on an intense beam of light to destroy their target. A particle beam weapon operates on a similar principle only it uses sub-atomic particles (electrons) to accomplish the same purpose.

For a discussion of "rail guns," *see* Robinson, *Defense Dept. Developing Orbital Guns*, AVIATION WEEK & SPACE TECH., July 23, 1984, at 61. A "rail gun" is a weapon which converts electrical energy to magnetic pressure which propels projectiles at very high velocities to destroy the target. At present, these guns can fire a projectile at velocities in excess of 6.2 miles per second.

23. *See Space War Era*, *supra* note 22, at 28.

24. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 [hereinafter cited as the Outer Space Treaty].

to function as intended. Finally, suggestions for revisions to the Outer Space Treaty will be synthesized from these three treaties. The goal of these proposed revisions is to make the Treaty more effective in carrying out its peaceful purpose.

I. THE OUTER SPACE TREATY

The Outer Space Treaty is considered a non-armament treaty.[25] It was designed to prevent a new form of "colonial competition" in space and prevent the damage that self-seeking exploitation might cause.[26] The Treaty entered into force on October 10, 1967.[27]

The Treaty emphasizes the peaceful use of outer space[28] and, through Article IV, restricts military activities in two ways. First, the Article contains a mandate not to place in orbit around the earth, nor install on the moon or celestial bodies, any nuclear weapons or any other weapons of mass destruction.[29] Second, Article IV limits the use of the moon to peaceful purposes, and expressly prohibits its use for (1) establishing military bases, installations, or fortifications; (2) testing weapons of any kind; or (3) conducting military maneuvers.[30] Because of the immediate threat to the peaceful use of outer space posed by orbital weapons,[31] concern must be focused on the meaning of "peaceful purpose" and the ability of Article IV to preserve this objective.

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25. United States Arms Control and Disarmament Agency, ARMS CONTROL AND DISARMAMENT AGREEMENTS: TEXTS AND HISTORIES OF NEGOTIATIONS 48 (1980 ed.) [hereinafter cited as ARMS CONTROL AND DISARMAMENT AGREEMENTS]. Non-armament means the treaty was intended to prevent arms or weapons from being placed in areas under its purview.

26. *Id. See also* Goedhuis, *Some Recent Trends in the Implementation of the Rules of International Space Law*, 19 COL. J. TRANS. L. 213 (1981). Shortly after the launching of the first space craft, it was thought the world would see a period where States would claim sovereignty over parts of outer space. The Outer Space Treaty was formulated to establish outer space as the common heritage of all mankind and promote international cooperation in the exploration and use of outer space. *Id.* at 214-19.

27. ARMS CONTROL AND DISARMAMENT AGREEMENTS, *supra* note 25, at 49.

28. *See generally*, Outer Space Treaty, *supra* note 24, Preamble.

29. Outer Space Treaty, *supra* note 24, art. IV states:

> States 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.

30. *Id.*

31. *See supra* text accompanying notes 12-23.

A. Peaceful Purpose

The preamble of the Outer Space Treaty recognizes "the common interest of all mankind in the . . . exploration and use of outer space for peaceful purposes."[32] This seemingly simple statement reflects the United Nations premise that outer space should be used only for peaceful exploits.[33] However, it must be kept in mind that the phrase "peaceful uses of outer space" is not a legal term of art.[34] Hence, this phrase can have different interpretations depending on the viewer's perspective, as well as differing interpretations from one document or treaty to another.[35] Consequently, there are two distinctly identifiable interpretations of the meaning of peaceful purpose.[36]

1. *The Soviet View.* Generally, the Soviet definition of peaceful uses of space excludes any activity of a military nature.[37] Recently, however, the Soviet perspective has grown more inconsistent, ranging from a call for total demilitarization to the idea that peaceful uses do not preclude retaliation against an aggressor.[38] The Soviets have yet to describe any of their space launchings as having a military function in the register maintained by the UN Secretary General.[39] In spite of this omission an estimated seventy percent of Soviet satellites serve a purely military function.[40] While advocating an ASAT

32. Outer Space Treaty, *supra* note 24.

33. C. CHRISTOL, THE MODERN LAW OF OUTER SPACE 14 (1982). By resolution, on December 13, 1958, the United Nations created the Committee on Peaceful Uses of Outer Space. The Committee was instructed to prepare a detailed report on space problems including the legal aspects of space exploration.

34. Butler, *Peaceful Use and Self Defense in Outer Space*, PROC. TWENTY-SIXTH COLLOQ. LAW OF OUTER SPACE 77 (1983).

35. *Id.* at 77-78.

36. *Id.* at 78

37. Jaksetic, *The Peaceful Uses of Outer Space: Soviet Views*, 2 AM. U.L. REV. 483, 493 (1979).

38. *Id.* at 495-96. A survey of Soviet writings reveals several apparently inconsistent views on the peaceful uses of outer space. The following are some examples:

> (1) The 'peaceful uses of outer space' means that all activities in space must be of a nonmilitary nature; that is, space should be completely and totally demilitarized.(2) The Outer Space Treaty provides for complete demilitarization of the Moon and other celestial bodies, but only partial demilitarization of outer space.(3) The principle of the peaceful uses of outer space does not preclude retaliation against an aggressor made via outer space or the use of space in accordance with Article 51 of the U.N. Charter.(4) The use of satellites for military surveillance is aggressive because it threatens the territorial integrity and national sovereignty of the nation-state under surveillance.(5) Satellites may be used to ensure compliance with certain treaties, *e.g.*, the 1972 Soviet-American Treaty on Limiting Antiballistic Missiles.

39. Goedhuis, *supra* note 14, at 18.

40. Butler, *supra* note 34, at 79.

treaty, the Soviets have refused to acknowledge their own ASAT capability.[41] By denying their own military activity in space, the Soviets have demonstrated that their view of "peaceful" still equates to non-military functions in outer space. This is true even though their activities in outer space have not been consistent with their concept of peaceful uses.[42] The Soviets are thus able to characterize their own activities as noble while contending that United States use of outer space is aggressive, militaristic and hence non-peaceful.[43]

2. *The United States View.* The United States interpretation of peaceful uses is termed non-aggressive.[44] Under this view, any military activity in space would be considered permissible as long as the activities could not be construed as intentionally aggressive.[45] In practice, the United States has declared it a national policy to use space for peaceful purposes, while at the same time pursuing national security objectives through non-armament type military activities.[46]

For practical reasons, this non-aggressive definition has gained general acceptance[47] due to the increased recognition of the importance of earth satellites.[48] Satellites have become essential for military reconnaissance, early warning, communications, navigation and meteorological missions.[49]

Space technology has also become an important element in the strategic doctrines of both the Soviet Union and the United States.[50] The technology is used not only for treaty verification,[51] but for pre-

41. Vlasic, *supra* note 16, at 148-49.

42. Jaksetic, *supra* note 37, at 496.

43. *Id.* at 494-95. According to Jaksetic:

> Since the beginning of the space age, Soviet writers have contended that: (1) the Cold War is the midwife of the United States' space research, (2) the West seeks to use space for its aggressive purposes, (3) the American exploration of space 'is subordinated to plans for its military utilization,' (4) the United States plans to use the moon for military purposes, (5) United States communications satellites will be used for purposes of Cold War propaganda, (6) American cooperation with other nations in space activities is designed to further militaristic goals of the Pentagon, produce profits for United States monopolists, and allow for the dumping of obsolete United States space equipment on other nations.

44. Goedhuis, *supra* note 14, at 16.

45. *Id.* at 17. Under this view, weapons serving a deterrent role would not be considered intentionally aggressive and thus would constitute use of space for peaceful purposes.

46. Hill, *Permissible Scope of Military Activity in Outer Space*, 24 A.F.L. REV. 157, 164 (1984).

47. CHRISTOL, *supra* note 33, at 22.

48. *See* Jasani, *supra* note 12, at 20.

49. *Id.*

50. *Id.*

51. Butler, *supra* note 34, at 79.

cise navigation by missile target guidance systems.[52] These practical uses of space technology are now viewed as having a stabilizing effect on tensions between the super-powers.[53] Thus, non-aggressive military uses of outer space have become accepted as "peaceful."[54]

The non-aggressive view of peaceful uses of outer space is consistent with Article III of the Outer Space Treaty which dictates that activities in space be conducted "in accordance with international law, including the Charter of the United Nations . . . ."[55] Neither international law nor the UN Charter prohibits military activity, *per se*.[56] Only threats or the actual use of force is prohibited.[57] The inherent right of self-defense is also reiterated in the United Nations Charter.[58] Since the non-aggressive definition accommodates non-threatening military activity and recognizes the use of defensive military devices, it seems to be more compatible with current international law.

Many of the satellites deployed for navigation, early warning, and verification are seen as having a stabilizing influence and hence, serve a peaceful purpose.[59] However, several questions remain unresolved. Does this indicate that any device or system which could be construed as contributing to strategic stability would be deemed as serving a "peaceful purpose"? More to the point, if it is said that a purely defensive weapon would enhance stability, will this weapon be serving a "peaceful purpose"? These questions characterize a trend which would justify the placement of virtually any weapon in space[60] creating a direct conflict with the original intent of the parties.

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52. CHRISTOL, *supra* note 33, at 20.

53. Hill, *supra* note 46, at 163. If a nation lost some or all of its military satellites, stability would suffer due to loss of the essential strategic elements of reconnaissance, early warning, communications and navigation. Vlasic, *supra* note 16, at 20.

54. *Id.* *See also* CHRISTOL, note 33, at 22.

55. Outer Space Treaty, *supra* note 24, art. III.

56. Butler, *supra* note 34, at 78. *See also* 2 L. OPPENHEIM, INTERNATIONAL LAW 202 (H. Lauterpacht 7th ed. 1952). In fact, war itself is not considered illegal, but merely a condition to be regulated, either by customary or conventional international law.

57. This is demonstrated by the U.N. Charter which states: "All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with Purposes of the United Nations." U.N. CHARTER art. 2, para. 4.

58. *Id.* Article 51 states in part: "Nothing in the present Charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs against a Member of the United Nations . . . ."

59. *See supra* text accompanying note 53.

60. *See supra* text accompanying notes 15-17, 46-53.

3. *Intention of the Parties.* In 1966, shortly before adoption of the Outer Space Treaty, the United States UN Ambassador Goldberg proferred the American view:

> It was a matter of the utmost necessity that the space age should continue to evolve in an environment of peace, law and co-operation. The old political problems of the earth were not [to be] entrenched anywhere else. Political conflicts on earth need not inhibit the development of a meaningful legal regime governing the activities of men and states elsewhere.[61]

Similarly, UN Ambassador Morozov of the Soviet Union stated the problem as:

> Whether outer space . . . [was] to become an area of peace and international co-operation or [was] to be used by the forces of aggression for purposes inimical to the interests of peace-loving peoples. All men of good will expected constructive steps to be taken to lay down rules of international law for regulation of state activity in the exploration and use of outer space.[62]

These statements by the ambassadors of the United States and of the Soviet Union would seem to indicate a strong intent to keep aggressive conflict from entering the space environment. In light of these two statements surrounding the creation of the Outer Space Treaty, a much narrower definition of "peaceful uses" should result; one under which even defensive weapons in space would probably not be accommodated. Nevertheless, actions of the parties in creating ASATs and the current plans to deploy new anti-ballistic missile systems[63] must be viewed as a contradiction of their earlier statements about "peaceful purposes." It is the vague character of the term "peaceful" which creates such concern about the ability of the Outer Space Treaty to prevent an arms race in space.

B. The Arms Control Capability of the Outer Space Treaty

Article IV, of the Outer Space Treaty reads in part:

> States 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.[64]

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61. U.N. Doc. A/AC.105/C.2/SR.58 *reprinted in* 3 N. JASENTULIYANA & R. LEE, MANUAL ON SPACE LAW 37-38 (1981).

62. *Id.* at 40.

63. *See supra* text accompanying notes 12-23.

64. Outer Space Treaty, *supra* note 24, art. IV. para. 1.

Legitimate concerns have been raised about the inadequacy of this provision due to the limited constraints it places on the types of weapons which may be introduced into outer space.[65] The ambiguous nature of the language found in Article IV is illustrated by the phrase which prohibits "*nuclear weapons or any other kinds of weapons of mass destruction*" from being placed in orbit around the earth.[66] The question is, what weapons are prohibited under this language?

1. *Conventional Weapons.* It is widely conceded that conventional weapons are permitted under the Outer Space Treaty.[67] This interpretation is borne out by the ASAT development of both the United States and the Soviet Union in which only non-nuclear explosive devices are used.[68]

2. *Nuclear Weapons.* The first sentence of Article IV mandates that: "States parties to the treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons . . . ."[69] Thus, the Outer Space Treaty expressly prohibits nuclear weapons in earth orbit.

3. *Weapons of Mass Destruction.* To date, the only generally shared definition of the phrase "weapons of mass destruction" was set forth in 1948 by the UN Commission for Conventional Armaments.[70] The Commission stated that: "weapons of mass destruction should be defined to include atomic explosive weapons, radioactive material weapons, lethal chemical and biological weapons, and any weapons developed in the future which have character-

65. CHRISTOL, *supra* note 33, at 25.

66. Hasselmann, *Weapons of Mass Destruction, Article IV Outer Space Treaty and the Relationship to General Disarmament*, PROC. TWENTY-FIFTH COLLOQ. LAW OF OUTER SPACE 99, 108 (1982). The author states:

> The term 'weapons of mass destruction' in Art. IV (1) is a dynamic one. Its content varies, following technological and political developments. Its role as a decisive factor in controlling the arms race in outer space will gain importance with the increasing armaments by states and their inability to conclude a treaty banning all weapons in outer space.

67. *See* Hill, *supra* note 46, at 164. *See also* Comment, *The Treaty on Outer Space: An Evaluation of the Arms Control Provisions*, 7 COLUM. J. TRANSNAT'L L. 259, 276 (1968).

68. Hasselman, *supra* note 66, at 108.

69. Outer Space Treaty, *supra* note 24, art. IV. No source was found on this topic which proffered an argument that nuclear weapons could be acceptable under the Outer Space Treaty. There were also no sources found indicating that nuclear weapons have ever been placed in orbit.

70. Hasselman, *supra* note 66, at 106.

istics comparable in destructive effect to those of the atomic bomb or other weapons mentioned above."[71] Although this definition specifically forbids nuclear, radioactive, chemical and biological weapons, the latest technological developments such as lasers, particle beam weapons, and microwave devices present more difficult problems of interpretation.

Although "mass destruction" has been defined as "the destructive effect of an atomic bomb,"[72] a serious problem remains in defining the term "weapon."[73] Several factors have been developed in a recent article by Hasselman which are relevant in determining the ordinary meaning of "weapon":

(1) the design of the instrument;
(2) its objective capability;
(3) the subjective intention of the users;
(4) the modalities of its use;
(5) the effect caused.[74]

As a hypothetical example of this problem imagine a solar power station whose beam could be diverted from supplying a city with energy to melting icebergs or destroying crops in any given geographical area, thus causing death and destruction on the scale of a nuclear device.[75] Using the aforementioned definitional criteria, the potential *effect* of this normally beneficial device could place it in the realm of weaponry subject to the treaty.[76]

It has been stated that laser and particle beam weapons are acceptable under Article IV because they are "point" weapons and not indiscriminate weapons of mass destruction.[77] Hypothetically, if sufficiently powerful, they could be used to destroy manned space stations or even wreak havoc on earth cities. Again, using the definitional criteria, the *subjective intent of the user* may be Intercontinental Ballistic Missile defense but, this weapon's *objective capabilities* of mass destruction could bring it under the purview of Article IV. A further illustration of the divergence in interpretation of the term "weapon" is the denunciation by the Soviet Union of the Amer-

71. U.N. Doc. S/C.3/30 (Aug. 13, 1948), *quoted in* Hasselmann, *supra* note 66, at 106.
72. *Id.*
73. Hill, *supra* note 46, at 164-65.
74. Hasselman, *supra* note 66, at 101. It is beyond the scope of this article to expound on each of these criteria.
75. *Id.*
76. *Id.*
77. Butler, *supra* note 34, at 79.

ican space shuttle as a potential weapons system.[78]

These examples are but a few which illustrate the ambiguities pertaining to Article IV. It must be remembered that international law is generally proscriptive in nature: what is not excluded is allowed.[79] Future space weapons systems may include neutron flux weapons, laser-directed nuclear energy which reduces warning times to one second, plasma jets heated millions of degrees into the fourth state of matter, and ionized gas (ball lightning) directed by radio at high velocities.[80] Whether these weapons are permissible under Article IV would appear to be only a matter of the user's or the opposing State's interpretation of that article.

In the course of the nuclear arms race there have been few periods when opposing sides were willing to limit their weapons.[81] With the exception of the Soviet ASAT devices, there are currently no weapons in outer space. However, with both powers developing space-based weapons systems,[82] only a relatively short time exists[83] to revise Article IV into a more formidable arms control measure.

II. COMPARISON OF THE OUTER SPACE TREATY WITH ARMS LIMITATIONS PROVISIONS OF THREE SUCCESSFUL ARMS CONTROL TREATIES: THE ANTARCTIC TREATY,[84] THE SEABED TREATY,[85] AND THE ABM TREATY[86]

In surveying these three treaties, the provisions within each agreement which have allowed that treaty to function as a successful

78. Woetzel, *Responsibility for Activities in Outer Space with Special Reference to Article IV of the Outer Space Treaty of 1967*, PROC.TWENTY-FIFTH COLLOQ. LAW OF OUTER SPACE 159, 160 (1982); *see also*, Vogt & Mervosh, *Space Arms Control: A Difficult Process*, PROC. TWENTY-FIFTH COLLOQ. LAW OF OUTER SPACE 167, 168 (1982). The authors state: "Indeed, the Soviets even believe their national security is threatened by direct broadcast satellites and various remote sensing activities. Such views cause a perceived need to counter these systems and result in the development and deployment of such things as antisatellite weapons."

79. Butler, *supra* note 34, at 79.

80. Woetzel, *supra* note 78, at 160.

81. Finch, *supra* note 11, at 109.

82. Butler, *supra* note 34, at 79.

83. Finch, *supra* note 11, at 109.

84. The Antarctic Treaty, Dec. 1, 1959, 12 U.S.T. 794, T.I.A.S. No. 4780, 402 U.N.T.S. 71.

85. Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Seabed and Ocean Floor, Feb. 11, 1971, 23 U.S.T. 701, T.I.A.S. No. 7337, 955 U.N.T.S. 115 [hereinafter cited as the Seabed Treaty].

86. Treaty between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems, May 26, 1972, United States-Soviet Union, 23 U.S.T. 3435, T.I.A.S. No. 7503 [hereinafter cited as the ABM Treaty].

arms limitation instrument will be determined. The Antarctic and the Seabed Treaties were chosen for analysis because they are analogous to the Outer Space Treaty in that they deal with restraints which are applicable to newly accessible environments.[87] The ABM Treaty was chosen because the immediate intent of both the United States and the Soviet Union in developing laser and particle beam weapons is Intercontinental Ballistic Missile defense.[88] Hence, the goal of limiting anti-ballistic missile weapons found in the ABM Treaty should also be applicable to the Outer Space Treaty.

1. *The Antarctic Treaty*. Major provisions of this treaty are directed toward the preservation of Antarctica "exclusively" for peaceful purposes. The non-militarization of the area, banning of all nuclear detonations and a unique system of unilateral inspection for verification of Treaty provisions are also provided.[89]

The Antarctic Treaty has the same "peaceful purpose" doctrine as the Outer Space Treaty; the avowed purpose of the Treaty is to maintain the "non-militarized" status of the continent.[90] The success of the Antarctic Treaty in maintaining the non-militarization of the area is due in large part to Antarctica's limited strategic value.[91] In addition, neither of the superpowers have acquired direct vested military interests in the area.[92] The same is not true of outer space since both super powers have not only realized the military advantages of using new technology in space, they have engaged in military activities in orbit since the beginning of the space age.[93] This does not mean, however, that the Antarctic Treaty has nothing to offer toward improving the Outer Space Treaty as an arms control measure.

Included in the Antarctic Treaty is a unique inspection system wherein each signatory designates its own inspectors who have com-

87. *See generally*, Stein, *Legal Restraints in Modern Arms Control Agreements*, 66 AM. J. INT'L L. 255 (1972). Antarctica, outer space, and the deep seabed have common characteristics which influenced negotiations: (1) they have become accessible recently due to new technology, (2) the environments [at least until recently] have not been considered strategically vital by the superpowers, (3) the environments are not subject to national sovereign rights comparable to those over land or airspace, and (4) since neither the superpowers nor any other state has ever engaged in prohibited activities, the military establishments have not acquired direct vested interests in such activities.

88. *See* Vlasic, *supra* note 16, at 164-65.

89. Woetzel, *supra* note 78; *see also* Hanessian, *The Antarctic Treaty 1959*, 9 INT'L. & COMP. L.Q. 436, 468 (1960).

90. Stein, *supra* note 87, at 259.

91. *Id.*

92. *Id.* at 258-59.

93. Vlasic, *supra* note 16, at 149-50.

plete freedom of access throughout Antarctica.[94] This was a pioneering achievement in that it represented the first time the United States and the Soviet Union both agreed to a verification system for unauthorized military activity.[95]

The important achievements of the Antarctic Treaty, through verification, have been the prevention of an extension of the arms race onto that continent along with the aversion of international strife and conflict over Antarctica.[96] Conversely, for outer space, excluding celestial bodies, no provisions concerning verification are found in the Outer Space Treaty.[97] The only verification provisions in the Outer Space Treaty pertain to the moon and other celestial bodies.[98] Thus, the Antarctic Treaty, with its emphasis on complete verification highlights at least one deficiency in the Outer Space Treaty.

2. *Seabed Treaty.* The Seabed Treaty, like the Outer Space and Antarctica Treaties, was created expressly to maintain use of the seabed "exclusively for peaceful purposes."[99] The Seabed Treaty, like the Outer Space Treaty, prohibits the parties from emplanting or emplacing nuclear weapons, or any other weapons of mass destruction, on the ocean floor.[100] As in the Outer Space Treaty, the use of conventional weapons is not constrained by the Seabed Treaty.[101] The problems of definitional ambiguity which surround the phrase "weapons of mass destruction" apply equally to the Seabed Treaty.

However, a unique aspect of this Treaty is the ability of the Disarmament Committee of the United Nations to request interpretive explanations from the superpowers.[102] The sponsors have responded to requests by clarifying, *inter alia*, that nuclear mines cannot be anchored to the seabed, that certain banned practices do not apply to commercial activities, and that bottom crawling vehicles designed for

94. Antarctic Treaty, *supra* note 84, art. VII; *see also* Hanessian, *supra* note 89, at 471.

95. Hanessian, *supra* note 89, at 471.

96. Segarra, *The Question of Antarctica*, 6 DISARMAMENT 50, U.N. Doc. ST/PSCA/D58, (Autumn/Winter 1983).

97. Outer Space Treaty, *supra* note 24.

98. *Id.* The first sentence of Article XII states: "All stations, installations, equipment and space vehicles on the moon and other celestial bodies shall be open to representatives of other states parties to the treaty on a basis of reciprocity."

99. Treves, *Military Installations, Structures, and Devices on the Seabed*, 74 AM. J. INT'L L. 808, 815 (1980).

100. Stein, *supra* note 87, at 264.

101. *Id.* at 265.

102. *Id.* at 266.

nuclear weapons are not permissible.[103] This clarification procedure, although not expressly provided for in the treaty, would be a valuable addition to the Outer Space Treaty in light of the diverse constructions possible for the terms "peaceful purposes" and "weapons."

Similar to the Antarctic Treaty, the Seabed Treaty also contains a provision for signatories to reconvene at certain intervals to amend or review the treaty's operation.[104] Periodic review conferences were not provided for in the Outer Space Treaty,[105] but appear to be a valuable method of steering the operation of a treaty toward the purpose the parties intended.[106] The review of the Seabed Treaty, held in September 1983, concentrated on its mandate in Article VII of the basic agreement.[107] Article VII requires the conference "to review the operation of this Treaty with a view to assuring that the purposes of the preamble and the provisions of the Treaty are being realized. Such a review shall take into account any relevant technological developments."[108] Through general debate, an article-by-article review took place.[109] The Conference concluded that no evidence had been presented to indicate that technological developments were adversely affecting the operation of the Treaty.[110] The review also concluded that the Treaty was a significant disarmament measure and was successfully accomplishing its intended purpose.[111] The review conferences have been assessed as a very important factor in the success of

103. *Id.* at 266-67. As the author explains:

> It was explained that submarines and submersible vehicles able to navigate in the water above the seabed and designed to carry nuclear weapons are considered to be like any other ship and would not be violating the treaty, even if anchored to, or resting on the bottom. Nevertheless, bottom-crawling vehicles (creepy-crawlers), which can move only when in contact with the seabed and which are specifically designed to use nuclear weapons, are prohibited. It was made clear that the treaty does not prohibit such peaceful uses of nuclear energy as nuclear reactors, scientific research and peaceful nuclear explosions. When a number of members of the Disarmament Committee [of the U.N.] pointed out that the Test Ban Treaty had prohibited all nuclear explosions under water and that the Seabed Treaty would not effect this ban, the sponsors declared that the latter treaty would not affect obligations under other arms control measures.

104. Goldblat, *The Seabed Treaty: Its History, Scope, Verification and Implementation.* 6 DISARMAMENT 53, 60, U.N. Doc. ST/PSCA/D58 (Summer, 1983).

105. Outer Space Treaty, *supra* note 24.

106. George & Owens, *The Second Review Conference of the Seabed Arms Control Treaty—A Retrospective Assessment* 7 DISARMAMENT 94, 100, U.N. Doc. ST/PSCA/D58 (Spring, 1984).

107. *Id.* at 94.

108. Seabed Treaty, *supra* note 85, art. VII.

109. George & Owens, *supra* note 106, at 99.

110. *Id.* at 98.

111. *Id.* at 100.

the Seabed Treaty.[112]

Review conferences provide an opportunity for the parties to evaluate the functioning of a treaty.[113] Because the world is on the brink of an arms race in space,[114] the need for a similar review conference to assess the continued viability of the Outer Space Treaty becomes self-evident.

3. *The ABM Treaty.*[115] It appears doubtful that either direct energy lasers or particle beam weapons are prohibited by the Outer Space Treaty.[116] The danger posed by deployment of these weapons is summed up by the following statement: "The prospect of a successful pre-emptive strike associated with directed-energy devices is so ominous that even the slightest evidence of asymmetry between the two superpowers in the development of this weapon could not fail to produce a dramatic political and military reaction."[117] In response to this fear of asymmetry, the Soviet Union and the United States bilaterally agreed to prohibit development, testing, or deployment of sea-based, air-based, or space-based anti-ballistic missile systems in the ABM Treaty.[118]

Outwardly, the ABM Treaty appears to prohibit the deployment of directed energy weapons which would be used for anti-ballistic missile defense.[119] Nonetheless, these weapons could still be deployed in an ASAT role without breaching the ABM Treaty.[120]

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112. *Id.* The authors declared:

> It is quite apparent that this review has fulfilled the letter and spirit of Article VII of the Treaty. The successful outcome of this conference has strengthened the Seabed Treaty's importance and usefulness. The Treaty continues to be judged a meaningful measure that enhances the security of all states and the cause of world peace.

113. *Id.* at 94.

114. *See supra* text accompanying notes 18-23.

115. An antiballistic missile system (ABM) is a system to counter strategic ballistic missiles or their elements in flight trajectory. Comment, *The Legality of A High Technology Missile Defense System: The ABM and Outer Space Treaties*, 78 AM. J. INT'L L. 418, 419 (1984) [hereinafter cited as *Legality of Missile Defense*].

116. *Id.* at 423.

117. Vlasic, *supra* note 16, at 165. The term assymetry as used here refers to one of the superpowers "falling dangerously behind the other in the acquisition of weapons which may alter the strategic equilibrium." *Id.*

118. ABM Treaty, *supra* note 86, art. V, para. 1.

119. *Id.* art. V.

120. HOUSE COMM. ON FOREIGN AFFAIRS AND SEN. COMM. ON FOREIGN RELATIONS, 98TH CONG., 1ST SESS.; FISCAL YEAR 1984 ARMS CONTROL IMPACT STATEMENTS 266-67 (Joint Comm. Print 1983) (Statement of the Arms Control and Disarmament Agency) [hereinafter cited as 1984 ARMS CONTROL IMPACT STATEMENTS]. The ABM Treaty bans development, testing and deployment of *all* antiballistic missile systems which are sea-based, air-based, space-based, or mobile land-based. Thus, the Treaty prohibits directed energy technology (or

Again a question of interpretation arises.[121] Would these weapons be construed as being only ASAT weapons or could they also be construed as anti-ballistic missile devices?

Forseeing the importance of maintaining the strategic "balance of power," which is the objective of the Treaty, the parties provided for a Standing Consultative Commission to resolve problems such as the one mentioned.[122] In the same manner as the clarifications requested by the Disarmament Committee in conjunction with the Seabed Treaty,[123] this procedure differs only in that it has been formally incorporated in the ABM Treaty. The effectiveness of the commission is demonstrated by the fact that in each case raised by the United States, the Soviet activity in question has either ceased, or additional information placated United States concerns.[124] Similarly, Soviet concerns about possible violations by radar apparatus in the United States appear to have been satisfactorily resolved.[125] Since these same problems arise under the Outer Space Treaty, a similar provision added to that Treaty would provide an invaluable tool in the maintenance of its peaceful purpose.

The ABM Treaty, in the same manner as the Seabed and Antarctic Treaties,[126] calls for a review by the parties at five year intervals.[127] The first such review was conducted by the Standing Consultative Commission in 1977.[128] Both parties agreed that the Treaty had operated effectively, that it continued to serve national security interests, and that no amendments were necessary.[129]

All three of these treaties contain tangible, workable provisions

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any other technology) used for this role. However, with regard to directed energy systems in an ASAT role, only the *actual* use of those systems to interfere with devices (satellites) used to verify compliance with strategic arms control agreements is prohibited under provisions of the ABM Treaty (art. XII).

121. *See supra* text accompanying notes 70-78.

122. *See* ABM Treaty, *supra* note 86, art. XIII. The phrase "balance of power" is synonymous with "strategic equilibrium" discussed *supra* note 117.

123. *See supra* text accompanying notes 102-03.

124. *See* ARMS CONTROL AND DISARMAMENT AGREEMENTS, *supra* note 25, at 138.

125. BUREAU OF PUBLIC AFFAIRS, U.S. DEP'T OF STATE, SPECIAL REPORT NO. 55, COMPLIANCE WITH SALT I AGREEMENTS 4 (1979).

126. *See supra* text accompanying notes 10 and 108.

127. ABM Treaty, *supra* note 86, art. XIV.

128. ARMS CONTROL AND DISARMAMENT AGREEMENTS, *supra* note 25, at 138.

129. *Id.* Current directed energy *research* programs are not constrained by existing arms control agreements. Nevertheless, future development, testing, or deployment of directed energy weapons having some ballistic missile defense potential could create conflict with obligations assumed by the United States under provisions of the ABM Treaty. Thus, consultation and amendment of the Treaty will be necessary. *See* 1984 ARMS CONTROL IMPACT STATEMENT, *supra* note 120, at 265-66.

which are instrumental in their effectiveness as arms control measures. These workable provisions provide a sound basis for overhauling the arms limitation sections of the Outer Space Treaty.

III. SUGGESTIONS FOR REVISION OF THE OUTER SPACE TREATY

Three distinct reasons exist for revising the existing Treaty instead of attempting to formulate a new agreement.

First, the Soviets have submitted a draft treaty on the prohibition of weapons of any kind in outer space to the United Nations General Assembly.[130] This proposal was rejected by the United States and several other Western countries.[131] This reaction was based on the Reagan Administration's feeling that the United States is in an unsatisfactory military position with respect to the Soviet Union.[132] Therefore,it is predicted that the relationship between the Soviet Union and the United States will be one of military competition for the indefinite future.[133] Even though the superpowers have recently resumed arms limitation negotiations, the Reagan Administration steadfastly refuses to negotiate regarding space-based defense weapons.[134]

Second, in the survey of the three Treaties, several useful provisions were pointed out which are not presently contained in the Outer Space Treaty. These provisions have been previously agreed upon in these other treaties and therefore might be more readily accepted than an entirely new agreement. Since a separate outer space weapons control measure appears unlikely, these previously agreed-upon provisions should be more palatable to the superpowers, if incorporated into the existing Outer Space Treaty.

Third, the advantage of working through an existing treaty is that the non-superpower signatories can exert a decisive influence over the superpowers and bring about the needed changes in the Outer Space Treaty. The non-superpower signatories are presently championing the peaceful use of space and opposing an arms race in

130. *Legality of Missile Defense*, *supra* note 115, at 423 n.51. For text of the proposed treaty see U.N. Doc. A/36/192. The Draft Treaty on the Prohibition of the Stationing of Weapons of Any Kind in Outer Space was submitted to the General Assembly on August 10, 1981.

131. *Id.*

132. ARMS CONTROL IN SPACE: WORKSHOP PROCEEDINGS 31 (Washington, D.C.: U.S. Congress, Office of Technology Assessment, OTA-BP-ISC-28, May 1984).

133. *Id.*

134. N.Y. Times, Oct. 16, 1985, at 1, col. 4. President Reagan stated regarding the Strategic Defense Initiatve: "we will not bargain this research and testing program away."

space.[135] The United Nations describes the role the non-superpowers play in arms control today:

> [I]t cannot be denied that the world, the vast majority of states, is becoming impatient. The Special Session of the General Assembly Devoted to Disarmament was one of the first symptoms of that impatience. The smaller nations requested the session and are largely responsible for its Final Document, which establishes an institutional framework for continued discussion in which these very nations can play a role. They want to raise their voices because they will be the first victims if a war should occur.[136]

The following revisions to the Outer Space Treaty are suggested in response to those voices.

(1) Forbid both offensive and defensive arms in outer space so as to give true meaning to the "peaceful purposes doctrine" and to maintain the "balance of power" intended in the ABM Treaty. Banning weapons of a defensive nature would effectively make the argument that defensive weapons are designed to keep peace and hence serve a "peaceful purpose" moot.[137] Banning all weapons in space, both offensive and defensive, eliminates the possibility of disrupting the present "balance of power" between the United States and the Soviet Union.[138] If new frontiers for weapon expansion are eliminated, the status quo (present "balance of power") will be much easier to maintain.

(2) Include a verification procedure similar to that provided in the Antarctic Treaty, which permits any signatory to inspect any facility as long as he does not interfere with the functions of the facility.[139] Under this proposal, verification provisions would apply to *all* areas of outer space, not merely the moon and other celestial bodies.[140]

Endless problems may arise concerning arms verification in space.[141] As an example, if the Space Shuttle is considered a poten-

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135. *See* Woetzel, *supra* note 78, at 160.

136. UNESCO, ARMAMENTS, ARMS CONTROL AND DISARMAMENT 277 (M. Thee 3d ed. 1981).

137. *See supra* text accompanying notes 53-60.

138. *See supra* text accompanying note 122.

139. *See supra* text accompanying notes 94-97.

140. *See supra* text accompanying notes 97-98.

141. For an interesting discussion of verification problems in conjunction with the proposed U.N. sponsored International Satellite Monitoring Agency, *see* Jakhu & Trecroce, *International Satellite Monitoring for Disarmament and Development*, 5 ANNALS AIR & SPACE L. 509 (1980).

tial weapons system,[142] then, what sort of vehicle could possibly be agreed upon as an effective verification vehicle?[143] Such problems would be interesting but, will only arise if outer space is subject to *total* verification, not merely the moon and other celestial bodies. Thus, provisions for verification should extend to earth orbit where most weapons would be placed.

(3) Institute clarification procedures such as those used in interpretation of the Seabed Treaty and the ABM Treaty by the Standing Consultation Committee. This will facilitate creation of practical and productive definitions of what devices may be considered "weapons." This procedure would also eliminate most of the definitional problems associated with useful and peaceful, but potentially dangerous technology such as space-based energy systems.[144]

(4) Provide for mandatory review conferences similar to those contained in the Seabed Treaty and the ABM Treaty in order to update, revise, and revitalize the amendments and the Outer Space Treaty as a whole. This procedure would keep the Treaty current and effective in dealing with new technology as well as other social, political and legal changes.[145] This process may also serve to periodically revitalize the "peaceful purpose" of the Treaty in contrast to the deterioration it is presently experiencing.[146]

IV. CONCLUSION

The modern arms race shows no inclination of slowing.[147] Instead, the world is faced with an imminent expansion of this threat into the final frontier of outer space.[148]

Because of ambiguous terms in the Outer Space Treaty, it is doubtful the instrument can effectively prevent an arms race in space.[149] Because the superpowers are not negotiating concerning space-based defense weapons, it would be easier to revise the Outer Space Treaty rather than to attempt to draft a new instrument.[150] The revisions based on successful provisions of the Antarctic Treaty,

142. *See supra* note 78 and accompanying text.

143. The limited scope of this article does not permit full discussion of verification problems.

144. *See supra* text accompanying notes 70-76.

145. *See supra* text accompanying notes 104-12, 122-29.

146. *See supra* text accompanying notes 59-63.

147. *See supra* text accompanying notes 1-5.

148. *See supra* text accompanying notes 7-23.

149. *See supra* text accompanying notes 32-80.

150. *See supra* text accompanying notes 130-36.

the Seabed Treaty and the ABM Treaty would greatly enhance the arms limitation capacity of the Outer Space Treaty.[151]

The time to act is now, before the superpowers make an irretrievable investment both monitarily and in national security. If the world stands idly by, this opportunity to halt an ever increasing threat of Armageddon may be lost forever.

Carl F. Hylin

151. *See supra* text accompanying notes 84-129.