ARMS CONTROL - OUTER SPACE +

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In 1790 the Regular United States Army numbered 80 enlisted men. Their basic weapon was the flintlock musket. Almost two hundred years later, the United States has become increasingly dependent on space-based resources to perform a variety of military and civil tasks. The United States currently employs orbital systems for a wide range of purposes, including communications relay, navigation, environmental monitoring, mapping and geodesy, astro-physics, threat surveillance, and strategic and tactical warning.

Arms control in space is inseparable from broader arms control matters and must be considered in the broader context. We cannot, therefore, ignore the experience of earlier attempts at arms control. The history of arms control negotiations demonstrates just how complex, difficult and vital such issues can be.

After World War I, the nations of the world made a serious effort toward world order in the establishment of the League of Nations and the Permanent Court of International Justice and they made a specific commitment to disarmament in the Covenant of the League.[1] In Article 8 of the Covenant, they asserted that "the maintenance of peace requires the reduction of national armaments to the lowest point consistent with national safety."[2] The Committee on Disarmament worked for the next eight years in the attempt to implement Article 8, but agreement on methods and principles broke down over the question of how to assure security before disarmament. General security was recognized as a prerequisite to disarmament, and sanctions against an aggressor as essential to security, but no nation was prepared to trust in the system to the point of disarming.

The Washington Naval Conference of 1922[3] actually achieved the single act of arms control of that time—a limitation of battleships by the United States, Great Britain and Japan in the ratio of 5-5-3. Because Japan held the short end of the 5-5-3 ratio the Treaties ultimately failed. The resulting resentment fed the rising Japanese militarism that led eventually to Pearl Harbor. Attempts during this period to distinguish "defensive" from "offensive" weapons for arms control purposes, failed. British experts maintained that the tank was an offensive weapon and should be controlled. French military planners saw them primarily as defensive weapons and argued that they should be unconstrained. Similarly, Britain, as a maritime power, wanted limits to be placed on submarines. Greece, concerned about offensive threats from the sea, asserted that submarines were defensive arms and resisted any controls.

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+ The views expressed in this article are those of the author and not necessarily those of the United States Arms Control and Disarmament Agency.

[1]For a text of the Covenant *see* 2 TREATIES AND OTHER INT'L AGREEMENTS OF THE UNITED STATES OF AMERICA 48 (1776-1949).

[2] *Id.* at 51.

[3]Limitation of Naval Armament (Five-Power Treaty or Washington Treaty), Feb. 6, 1922, 43 Stat. 1655, Treaty Series 671.

Subsequently, the Locarno Treaties[4] committed Germany and France to mutual guarantees of boundaries and committed Germany to arbitration in any disputes with Belgium, France, Poland or Czechoslovakia. The Kellogg-Briand Pact[5] committed its signatories to the renunciation of war. None of these agreements were structured to deter aggression or to provide for sanctions when violations occurred. Finally, in 1933, Britain, France, Germany and Italy signed a No Force Declaration pledging "not in any circumstances to attempt to resolve any present or future differences between them by resort to force."

This short excursion into the early history of arms control efforts demonstrates the importance of the principle that arms control agreements must truly enhance security. Secretary Haig has made it clear that the United States will seek agreements that make world peace more secure by reinforcing deterrence and has defined the elements of United States arms control policy. This policy, which is also relevant for space purposes, is summarized by the following considerations and principles:

> —Whether a particular agreement undermines or supports deterrence may change with the development of new weapons systems. Arms control agreements therefore must be designed so that they can adapt flexibly to long-term changes.
> —Each arms control agreement must be balanced in itself and contribute to an overall balance.
> —Another important principle of our arms control policy is to seek arms control agreements that include effective means of verification and mechanisms for securing compliance. Unverifiable agreements only increase uncertainty, tensions, and risks. After all, if the parties trusted each other, they would not need the arms that they now seek to control.

Turning then to outer space, we all know there are a considerable number of international agreements applicable to space containing arms control elements. The Limited Test Ban Treaty of 1963[6] prohibits, among other things, the parties to the Treaty from carrying out nuclear explosions of any kind in space. Since the Limited Test Ban Treaty was signed, the importance of the ban on nuclear tests in outer space has increased dramatically. The satellites employed today are more sophisticated than formerly and at the same time their complex onboard systems are more vulnerable to radiation damage from nuclear explosions in space.

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[4] *See* Locarno Treaties, 54 L.N.T.S. 289, 305.

[5] Kellogg-Briand Pact Aug. 27, 1928, 46 Stat. 2343, Treaty Series 796, 94 L.N.T.S. 57.

[6] Treaty Banning Nuclear Weapons Tests in the Atmosphere in Outer Space and Underwater, Aug. 5, 1963, 14(2) U.S.T. 1313; T.I.A.S. 5433; 480 U.N.T.S. 430 (1963).

The Outer Space Treaty[7] which entered into effect in 1967, establishes a general norm of peaceful uses of outer space. Article III states that the space activities of States parties to the Treaty shall be conducted ". . . 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."[8] Article IV prohibits the placement in orbit, the installation on celestial bodies, or the stationing in outer space of nuclear weapons or any other kinds of weapons of mass destruction.[9] In addition, Article IX requires international consultations prior to any planned space activity or experiment if the state undertaking it has reason to believe such activity or experiment would cause potentially harmful interference with the peaceful space activities of others.[10]

Other international agreements extend specific protections to certain classes of satellites. The United States and the Soviet Union have undertaken expressed obligations not to interfere with each other's national technical means (NTM) of verification under the SALT ONE Interim Agreement,[11] the ABM Treaty,[12] the Treaty on Underground Nuclear Explosions for Peaceful Purposes,[13] the Threshold Test Ban Treaty,[14] and the SALT TWO Agreements.[15] Under the Direct Communications Link Improvement Agreement,[16] both nations have confirmed their intention to take all possible measures to assure the continuous and reliable operation of the emergency

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[7]Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (hereinafter "Outer Space Treaty"), Jan. 27, 1967, [1967] 18 U.S.T. 2410, T.I.A.S. 6347, 610 U.N.T.S. 205 (effective Oct. 10, 1967).

[8] *Id.* at art. III.

[9] *Id.* at art. IV.

[10] *Id.* at art. IX.

[11]Interim Agreement Between the United States of America and the Union of Soviet Socialist Republics on Certain Measures with Respect to the Limitation of Strategic Offensive Arms, May 26, 1972, 23 U.S.T. 3463, T.I.A.S. 7504.

[12]Treaty on the Limitation of Anti-Ballistic Missiles, signed at Moscow May 26, 1972; entered into force Oct. 3, 1972. 23 U.S.T. 3435; T.I.A.S. 7503.

[13]Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, Aug. 5, 1963, [1963] 14 (2) U.S.T. 1313, T.I.A.S. 5433, 480 U.N.T.S. 430 (1963).

[14]Treaty Between the United States of America and the Union of Soviet Socialist Republics and Protocol to the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Underground Nuclear Weapon tests, signed at Moscow, July 3, 1974, (also known as the "Threshold Test Ban Treaty). For text *see* U.S. Arms Control and Disarmament Agency, Arms Control and Disarmament Agreements 158-161 (1977).

[15]For details regarding the SALT TWO Agreements, *see* U.S. ARMS CONTROL AND DISARMAMENT AGENCY: ARMS CONTROL AND DISARMAMENT AGREEMENTS 128*ff.*

[16]Agreement on Measures to Improve the Direct Communications Link, entered into force Sept. 30, 1971, 22 U.S.T. 1598, T.I.A.S. 7187 (1971).

satellite system; and under the International Telecommunications Convention,[17] each party is obligated to avoid harmful interference with the radio services or communications of other parties.

Orbiting satellites may be deployed for attack warning, attack assessment, damage evaluation, civil and military navigation, intelligence collection, target location and identification, arms limitation verification, and long-distance communications. At present, the United States and the Soviet Union together have about 150 active satellites in orbit.

In many cases the functions performed by satellites were formerly carried out by earth-based facilities: by undersea cables and radio, in the communications area, for example, and by radio beacon systems in the navigation area. Theoretically, the United States could, if necessary, revert to ground-based systems in these cases, although at higher costs and provided that they have not been dismantled. In other cases, however, satellites provide unique capabilities that cannot readily be duplicated by ground-based systems. The photographic surveillance mission, so crucial for arms control verification and crises monitoring during regional conflicts, is an important example.

The growing importance of both civilian and military satellites has given rise to considerable concern that anti-satellite weapons could be developed to threaten them. In the face of this concern and the threat of an already tested Soviet ASAT system, the United States is developing an ASAT capability and seeking to improve satellite survivability.

The United Space Defense System Program involves four functional areas: (1) anti-satellite systems; (2) space systems survivability; (3) space surveillance systems; and (4) command and control. With respect to arms control, United States policy with regard to space defense is under review.

The Soviets have a vigorous and constantly expanding military space program. In the past ten years they have been launching in excess of 75 spacecraft per year, four-to-five times more than the United States. We estimate that 70 percent of Soviet space systems serves as a purely military role, another 15 percent serves dual military roles and the remaining 15 percent is purely civil. The Soviet military satellites perform a wide variety of reconnaissance and collecting missions. Military R&D experiments are performed on board Soviet manned space stations, and the Soviets continue to develop and test an ASAT anti-satellite co-orbital interceptor.

Can we make any assessments about the effect of developing space technology upon the space environment over the next decade?

Technological developments and the difficulty to predict them complicate arms control generally and space arms control in particular.

In 1975, Professor Harvey Brooks, writing in the Journal of the Academy of Arts and Sciences, summarized the principal differences between past and future technological advances:

> . . . The revolutionary technological situation that existed [from 1955 to 1965] may have been unique. . . . The revolutionary fifties and sixties were made possible by the confluence of several basic technological advances which came to maturity at more or less

[17]Art. 33 of the International Telecommunication Convention, Malaga-Torremolinos, Oct. 25, 1973, (entered into force for the United States April 7, 1976), 28 U.S.T. 2495, T.I.A.S. 8572.

> the same time—solid fuel rocket propulsion, high-yield-to-weight thermonuclear warheads, inertial guidance, compact solid-state electronics and computers, MIRV and re-entry technology. . . [yet]. . . the cumulative effect of many small evolutionary improvements in the parameters of component technologies can often be as revolutionary as such dramatic basic developments as the transistor or the hydrogen bomb.[18]

It is generally agreed that Brooks' characterization of the direction of technology remains sound, and his expectation of dramatic consequences arising from evolutionary innovation is being fulfilled. We must note, however, that the diverse applications of incrementally improving technologies also seem today of greater significance than the rate of change itself. This is exemplified by the diverse uses for which satellites are employed. Nevertheless, although it is difficult to predict with exactitude the effect of future technological change, we may assume, with Professor Donald Hafner of Boston College, that arms control planning for the next decade will have to deal with the following major categories of space use:

1.) Satellites for the collection and conveyance of information for civil, military and scientific purposes. The increasing numbers within this category of satellites will make it more difficult to regulate military activities in outer space on the basis of provisions which distinguish satellites with military purposes from non-military ones.

2.) Satellites as platforms for weapons to be used against other space objects (ASATs). The term "anti-satellite" (ASAT) is generically used to describe any device that can be used to destroy the operational capability of satellites in Earth orbit. These devices can be based on the ground, in airplanes, or in space. Such systems can involve (a) the direct ascent launch of a missile carrying a warhead; (b) co-orbital devices with explosive warheads; or (c) use of a directed-energy weapon such as a laser beam. Conventional warheads for ASATs could involve explosive devices or impact devices. From an arms control perspective, a major problem will be verification.

3.) Satellites as platforms for weapons to be used against terrestrial targets, *e.g.*, ships, aircraft, cruise and ballistic missiles. There will not be much incentive to attack terrestrial targets from outer space, unless it is possible, using space-based sensors, to direct and track such targets in real time, at long range, and with great precision.

4.) Satellites as platforms for industrial manufacturing, power generation, etc. for terrestrial consumer needs. Many believe that it is unlikely that such activities will constitute a major use of space within the coming decade.

This listing of categories of space activities obviously does not include all changes that could occur in space activities but it does indicate that space will become more crowded, raising the concern for the protection of satellites from accidental or intentional harm.

High on the United States list of space concerns is the protection of American space systems vital to national security from a possible Soviet anti-satellite threat. It is believed that development of a United States anti-satellite system will enhance protection of United States satellites by deterring attacks upon them. The United States is developing a prototype anti-satellite weapon that consists of a modified short-range attack missile, an ALTAIR rocket second stage and a miniature vehicle warhead. The launch platform

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[18]Harvey Brooks, *The Military Innovation System and the Qualitiative Arms Race, DAEDALUS*, Summer 1975, p. 78.

for this anti-satellite weapon would be the F-15 fighter aircraft. The development of high energy directed beam weapons for applications in space also is being investigated. While high energy lasers and particle beams differ in state of development and in the technology required to realize them, if they can be developed as weapons, their implications for possible anti-satellite negotiations and space defense issues generally will have to be considered.

In March 1977, the United States proposed to the Soviets the formation of a joint working group to discuss arms control limitations on anti-satellite systems. The first round of talks was held in Helsinki on June 8-16, 1978. The discussions were exploratory in nature to determine the possibility and basis for subsequent negotiations on limiting certain activities directed against space objects and systems for conducting such activities. Two more rounds of talks were held in 1979.

At this time, the future of ASAT negotiations depends, in part, upon the results of the United States ASAT policy review. It can readily be concluded that no agreement would be acceptable that would either place the United States in an inferior position vis-a-vis the Soviet Union or that was not verifiable.

The United States has supported responsible efforts to control arms in outer space. We have sought in the past, through such major international agreements as the Limited Test Ban and Outer Space Treaties, to limit arms in space. However, the contributions which space systems can make to self-defense, deterrence and arms control verification also must be recognized.

The United States use of space for military purposes has been non-aggressive and has shown restraint. Presently, the United States has no desire to engage in a costly arms race in outer space. Current United States research and development activities in the anti-satellite field are in partial response to the threat created by the Soviet ASAT system.

Space arms control policy is currently undergoing careful study within the United States Government. The issues are complex and must be considered in the context of the broader arms control issues to which they relate. The lessons of history have taught us that such agreements, like all arms agreements, will have to be equitable, balanced, verifiable, and be designed to provide stability and to enhance security.