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BACKGROUND PAPER

"PEACEFUL" AND MILITARY USES OF OUTER SPACE: LAW AND POLICY

PREPARED

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Organization of the paper:

1. Defining the Issues: "Peaceful Uses" of Outer Space; Militarization vs. Weaponization of Space

2. Historical Evolution of Military Uses of Outer Space and of Trends in Policy and Legal Responses to Space Militarization and Weaponization
    - 2.1. Technical and Policy Developments
        - 2.1.1. Cold War Era
        - 2.1.2. Developments in the 1990s
        - 2.1.3. Current Developments
            - A. United States
            - B. Russian Federation
            - C. China
            - D. European Union
            - E. North Korea
            - F. Japan
            - G. Other Countries
    - 2.2. International Agreements and Space Weaponization

3. The Debate over Space Weaponization

    - 3.1. Selected Arguments for Weaponization
    - 3.2. Arguments against Weaponization

4. Reasons for Increased Public Awareness: Why Should We Care?

List of References

Section 1. Defining the Issues: "Peaceful Uses" of Outer Space; Militarization vs. Weaponization of Space

Since the early days of the space era the international community has strongly endorsed the use of outer space for "peaceful" purposes. Although the term appears in many UN documents and space law treaties, still, more than 47 years after the launching of Sputnik I, the term "peaceful" still lacks an authoritative definition. The initial and widespread interpretation of the term "peaceful" in relation to outer space was "non-military" and it seemed to be shared by both the United States and USSR. However, soon after the launching of the early artificial satellites, the United States started to change its position in regard to the meaning of the term "peaceful uses", claiming that the term means "non-aggressive" rather than "non-military." (Vlasic, 1991). According to this view, all military uses of outer space were to be permitted and considered lawful as long as they remain "non-aggressive", according to Article 2(4) of the UN Charter, which prohibits the "threat or use of force."

For several years in the beginning of the Space Era, Soviet Union maintained the position that "peaceful" meant "non-military" and that all military activities in outer space were non-peaceful and possibly unlawful. However, even during that period, the Soviets continued to place into orbit a growing number of military payloads and grew increasingly dependent on space technology in their military planning. Eventually, however, the Soviet Union and other States sharing the original interpretation of "peaceful" appeared to have accepted that outer space may be used for military purposes (Vlasic, 1995). This change in position was summarized by a representative of a Western delegation in the Ad Hoc Committee on the Prevention of an Arms Race in Outer Space of the Conference on Disarmament according to whom: "even though in some contexts 'peaceful' means 'non-military', any ambiguity has been clarified by State practice which had not been contradicted in a forceful manner by any State formally protesting military utilization of space." (UN Doc. CD/1165 of 12 August 1992).

In this context, a distinction must be made between "militarization" and "weaponization" of outer space. If one accepts the position that militarization of space began with the launching of the earliest communications satellites serving military objectives, weaponization is generally understood to refer to the placement in orbit of weapon systems that could attack targets in space or on the Earth. Although to this day there is no authoritative definition of "space weapon",[1] there are space-based devices that have indirectly a destructive capacity (e.g., satellites serving GPS navigation of military aircraft and precision guided missiles). However, satellites themselves have no destructive capacity on their own and their support of military missions is not considered weaponization of space (Estabrooke, 2001). In this context, a distinction is made between two categories of military assets: "force

[1] For example, according to a definition proposed by a group of UNIDIR experts: "A space weapon is device stationed in outer space (including the Moon and other celestial bodies) or in the earth environment designed to destroy, damage or otherwise interfere with the normal functioning of an object or being in outer space, or a device stationed in outer space designed to destroy, damage or otherwise interfere with the normal functioning of an object or being in the earth environment. Any other device with the inherent capability to be used as defined above will be considered as a space weapons." (Jasani, 1991). While this type of definition includes also ground-, sea- and air- based weapons in the category of space weapons, more recent definitions refer mainly to space-based weapons (see, e.g., Westdal, 2001).

application", i.e., strike weapons, and "force support" (communications, command and control, sensor and surveillance (Johnson, 2002).

Section 2. Historical Evolution of Military Uses of Outer Space and of Trends in Policy and Legal Responses to Space Militarization and Weaponization

2.1. Technical and Policy Developments

2.1.1. Cold War Era

Since the beginning of the space era, both the United States and the former Soviet Union developed and implemented programs that were more military in nature than civilian or scientific (York, 1986). In the United States, as early as 1946, the so-called "Project RAND", uniting a group of technical experts, published a study analyzing the engineering possibilities of designing an artificial Earth satellite and concluded that such a device would have great military applications (Douglas Aircraft Company, 1946).[2] In the following years, additional studies undertaken by different sources suggested that it was possible to use an artificial satellite as a reconnaissance instrumentality (Vlasic, 1995). It is interesting to note that during the earliest stage of space use and exploration, the US stressed the importance that future developments in outer space be devoted "exclusively to peaceful and scientific purposes" and, with this aim, the testing of satellites and missiles should be placed under "international inspection and participation" (Cabot Lodge, 1957). Similarly, President Eisenhower was cited as saying: "I propose that we agree that outer space should be used only for peaceful purposes. We face a decisive moment in history in relation to this matter.… Should not outer space be dedicated to the peaceful uses of mankind and denied to the purposes of war?" (Eisenhower, 1958).

The launching on 4 October 1957 by the Soviet Union of Sputnik, the first artificial satellite marked the beginning of an intense space rivalry between the USSR the United States, which lasted throughout the Cold War. As both space powers realized the importance of space as the ultimate "high ground", the launch of Sputnik was seen not only as a scientific achievement but also as the trigger of a military revolution with extraordinary strategic consequences (Vlasic, 1991). US Secretary of State at the time, John Foster Dulles, described the launching of Sputnik as "a decisive turn in the worldwide struggle between Communist imperialism and the free world" (Dulles, 1958). The Pentagon became worried that the next step to be taken by the Soviets will be placing weapons in space. President Dwight D. Eisenhower was encouraged by the military and several think tanks to launch a space – weapons program to counteract the raising Soviet space power. However, he refused to extend the arms race into space (Moore, 2001). In 1958, in a letter to Nicolai Bulgarin, the Soviet Premier, Eisenhower proposed that the two super-powers agree to use the space "only for peaceful purposes" and not for the "testing of missiles designed for military purposes" (Eisenhower, 1958). Thus, it appeared that early in the Cold War, the two original space-faring

[2] The Santa Monica Engineering Group of Douglas Aircraft Company that produced the report became the Rand Corporation in 1948.

States reached an agreement regarding "their common interest in avoiding military conflict and competition in space" (Stares, 1985).

During this period, while both the Soviet Union and the United States publicly proclaimed that outer space should be dedicated "exclusively" to peaceful purposes, both were secretly developing and launching a great number of satellites that were used for military purposes. Starting in 1960 the US implemented several satellite programs, code named CORONA, SAMOS ("Satellite and Missile Observation System"), and Discover, perhaps the first space-based reconnaissance systems. Apparently as a result of technological limitations in the development if anti-satellite systems, through a tacit agreement between Washington and Moscow, the overhead reconnaissance by satellites was accepted as legitimate confidence-building and information-exchange means between the US and USSR (Steinberg, 2001). In fact, in the first US-USSR Strategic Arms Limitation Treaty (SALT), signed in 1972, the two sides formally agreed not to attack the other's "national technical means of verification", as a recognition of the importance of satellite reconnaissance for maintaining a credible nuclear deterrent and for reducing uncertainty in decision-making based on actual knowledge of what the other side was doing (Mark, 1986). During the remainder of the Cold War, reconnaissance and surveillance would have three basic functions for both sides: technical intelligence collection, targeting, and arms control monitoring and verification (considered Non-intrusive Technical Means of Verification (NTM)) (Burrows, 1997).

Other military uses of satellites (e.g., for communications and navigation, detection of nuclear explosions in space, missile launchings and weather monitoring) came to be accepted by both super-powers as lawful and useful (Vlasic, 1995). In the decades since 1957, the number and quality of military space-based systems improved constantly and resulted in transforming outer space in the most heavily militarized environment (Vlasic, 1995). No later than 1967, the year when the Outer Space Treaty came into force, satellites were already an integral and irreplaceable part of the defense systems of both the US and USSR.

In addition to using satellites for a variety of military purposes, both the US and USSR tested several types of anti-satellite (ASAT) weapons, which included ground-, sea-, air- and space-based instrumentalities using kinetic-energy and directed-energy weapons (FAS Report). The development of the Soviet ASAT system began in early 1960s. The first flight-tests were performed in 1963-1964 and reportedly the tests continued until 1982. In November 1983, the Soviet Union announced a unilateral moratorium on further ASAT tests and this moratorium apparently is in place to this date (Podvig, 2004). The United States started in 1983 testing an ASAT homing vehicle, as part of President Reagan's Strategic Defense Initiative (also known as the Star Wars). However, the Star Wars program was discontinued and to date the US has not deployed an ASAT in space. Thus, although both superpowers have looked into developing space weapons, during the Cold War, it appears that no side has deployed such weapons, "at least in the white (unclassified) world" (Theresa Hitchens quoted in Shachtman, 2004).

It should be noted that the UN General Assembly was quick to respond to the advent of outer space uses. On 14 November 1957, the UN General Assembly adopted its first resolution on outer space, Resolution 1148 (XII), which reiterated the need to use the outer space "exclusively for peaceful purposes". The following year, the General Assembly hosted a

multinational debate on "Questions of the Peaceful Use of Outer Space" during which the term "peaceful" was used as an antonym to "military" by virtually all participants. The positions expressed during the debates were reflected in the text of resolution 1348 (XIII) according to which the States recognized as their "common aim" that outer space "should be used for peaceful purposes only." Also, this resolution established the ad hoc Committee on the Peaceful Uses of Outer Space (COPUOS), which became a year later, by Resolution 1472 (XIV), a regular committee of the General Assembly. In addition, it should be noted that the UN Conference on Disarmament (CD) has been debating since 1981 an agenda item entitled "Prevention of an Arms Race in Outer Space" (PAROS) with a view of preventing the weaponization of outer space and negotiating a treaty to regulate the military uses of space.

2.1.2. Developments in the 1990s

In the 1990s, space became an integral component of military planning. Total integration of space assets into the military systems became most evident during the 1991 Persian Gulf War, described as "the first 'space war', since it was the first occasion on which the full range of modern military space assets was applied to a terrestrial conflict." (US Air Force Chief of Staff, Merrill McPeak, cited in Vlasic, 1995). Although satellites can not attack targets directly, they have become what Pentagon calls "force enhancement" by providing surveillance, improving targeting, reconnaissance, communications, navigation, and missile warning. During the 1991 Gulf War, two defense system satellites handled almost 80 per cent of military communications (Woods, 2003).

Another trend that begun in the 1990s was the revolution in computers and telecommunications, leading to vastly increased private sector commercial utilization of satellites. In 1996, 30 percent of all satellites were owned and operated by private companies (Howland, 2003). Another aspect of the satellite market during that decade was the growth of dual-use systems in which military and commercial users share the services provided by a single satellite. The use of commercial satellites by the military was found to be cheaper and faster. For example, it is estimated that commercial satellites are usually delivered 18 months after they are ordered, while the development of national security satellites can take 10 to 15 years (Howland, 2003).

Also, during the late 20th century, other nations, starting with France and then China, joined the US and Russian Federation in using space for military purposes, although on a more limited scale. It should be also noted that there were reports that four dozen satellites from nearly two dozen countries assisted the 1999 North Atlantic Treaty Organization (NATO)'s campaign against Yugoslavia (Space Today, "Satellite Wars"). Again, space proved to be a core asset to modern war fighting capabilities (Howland, 2003).

In the framework of UN, one should note that during the 1990s, the Conference on Disarmament (CD) made some progress in drafting a treaty on banning space weapons until disagreement between China and the US in 1995 prevented consensus; the CD has remained effectively paralyzed since 1995.

2.1.3. Current Developments

The commercialization of outer space is growing and the National Defense Industrial Association (NDIA) predicts that by 2010, an estimated 1,700 commercial satellites will be functional in Earth's orbit, out of which 70 per cent will be privately - owned and - operated. Moreover, according to NDIA, most space-based assets will be owned by multinational companies. NDIA estimates that by 2010, 80 per cent of all communication satellites and 20 per cent of all remote sensing satellites will be owned by private trans-national businesses and thus may transcend a stricter government control (Howland, 2003). In addition, the commercial development and access to remote sensing satellite technology has exploded in recent years. Additional countries are developing independent space capabilities and civilian satellite imagery services are becoming increasingly available on the global commercial market (Steinberg, 2001). Another trend is the proliferation of missile technology required for launching satellites, especially in the developing countries, such as Israel, Brazil, Pakistan, North Korea, South Korea and Iran. In this context, the increased reliance by military users on commercial satellites triggered various policy responses from the main space-faring nations.

A. United States

The importance of space to US security was dramatically demonstrated during the recent Iraqi war. At least 50 satellites support the US military operations, providing reconnaissance data, communication links for troops on the ground, aircraft in flight and ships at sea, precise targeting data for cruise missiles and smart bombs, instant warning of hostile missiles launches, weather forecasting, commercial TV programming for US forces, and many other services (Woods, 2003). Another 27 satellites that form the Global Positioning System played an essential role in the Iraqi conflict by providing indispensable navigational information for the troops on the ground and aircraft in flight. According to the Air Force Undersecretary, Peter Teets, who is also the head of the National Reconnaissance Office (NRO), the Iraqi war will be seen as "the most integrated and precise military engagement in history", mainly due to a greater use of space-based equipment (Reuters, "Iraq Boosts Space Spending"). Space is becoming the "ultimate high ground of the 21st Century warfare (Woods, 2003).

At a time when space-based communications are vital to its military, the United States is increasingly dependent upon commercial satellites for communications. The Department of Defense increasingly relies more on commercial satellites in support of its military operations rather than its own systems due to high costs and the inability of government providers to match demand. During military operations in Kosovo in 1999 and Iraq in 2003, eighty percent of all space borne communications were transmitted through multinational and commercially owned satellites, and such reliance continues to grow.

The increased reliance by the US on commercial satellites also prompted General Richard Meyers, the Chairman of the Joint Chiefs of Staff to state: "Clearly, our reliance on commercial space has created a new center of gravity that can easily be exploited by our adversaries." (quoted in Howland, 2003). This sense of vulnerability is expressed in the 2001 Space Commission Report chaired by Secretary of Defense Donald Rumsfeld, according to

which "those hostile to the US can acquire on the global market the means to deny, disrupt or destroy US space systems … nowhere else does our defense capability rest on such an insecure firmament". The Report warns that the country could face a "space Pearl Harbor" in the years to come. According to the Space Commission, this disaster should be avoided and the best way to do that is to "vigorously pursue the capabilities … to ensure that the President will have the option to deploy weapons in space."

Faced with the perceived challenges, the US is focusing on the issue of space control, presumably through the deployment of offensive capabilities able to ensure uninterrupted use of their space assets (Watts, 2001). In this sense, the US Space Command's Vision for 2020 calls for "full spectrum dominance" arguing that "the medium of space is the fourth medium of warfare – along with land, sea, and air." Also, the National Security Strategy, issued by the White House in 2002, acknowledges the need to develop military capabilities able to "protect critical US infrastructure and assets in outer space".

One may also mention the US Air Force Transformation Flight Plan which makes US dominance of air and space a top Pentagon priority in the 21st century, and to this end envisions the deployment of a wide array of weapons, from anti-satellite lasers to weapons that "would provide the capability to strike ground targets anywhere in the world from space." (Shachtman, 2004). In addition, there are reports that the Pentagon expects to spend at least $50 billion over the next five years to develop and field a multi-layered shield against incoming missiles that could deliver nuclear, biological, or chemical weapons. This shield, which was first proposed by President Reagan under his "Star Wars" plan, includes space-based interceptors. Such a system could also function as anti-satellite weaponry (Wolf, 2004). It should be stressed that most of these developments came after the 2002 US withdrawal from the Anti-Ballistic Missile (ABM) Treaty. Given these developments, it is not surprising that the US continues to oppose proposals aimed at "prevention of an arms race in outer space" (PAROS) discussed in the Conference of Disarmament, arguing that there is "no need for new outer space control agreements" (Javits, 2002). One should also note that, along the same lines, the Space Commission Report states that "[t]he US must be cautious of agreements intended for one purpose that, when added to a larger web of treaties or regulations, may have the unintended consequence of restricting future activities in space." (Space Commission Report 2001).

In addition, two other recent military policy trends raised concerns among other nations. First is the so-called the "negation policy". According to National Reconnaissance Office (NRO) director, Peter Teets, the US is now pursuing a policy of "active denial" of the use of space for intelligence and communication purposes to any other nation (not only adversaries but even longtime allies) at any time (Teets, cited from a presentation at the National Space Symposium in Colorado Springs).

The second development is the so-called unilateralism and first-strike and it appears in a report released by the White House and entitled "The National Security Strategy for the United States of America." This report outlines the elements of a doctrine according to which "the United States will constantly strive to enlist the support of the international community" but the US "will not hesitate to act alone, if necessary, to exercise [its]right of self-defense by

acting preemptively" against its enemies. (The National Security Strategy for the United States of America, cited in Jakhu, 2002).

B. Russian Federation

Recent reports on the status of Russian space programs suggest that Russia continues to support its military space program, especially the development of early-warning and communication satellites, but not space weapons or anti-satellite capabilities (Povdig, 2004). According to recent political statements, presently and for the near future, the Russian Federation has no plans to develop or place in outer space any space weapon system. In addition, Russia consistently seems to adhere to its moratorium on ASAT testing (Skotnikov, 2004). Given its modest military budget, one should not expect major investments by Russia in offensive space instrumentalities, such as space weapons.

However, in November 2004, Russian Defense Minister Serghei Ivanov was quoted by a Russian news agency as saying that Russian military has successfully tested a modernized missile defense system, and that they intend to continue perfecting and modernizing that system. This report came less than two weeks after President Putin announced that Russia was carrying out tests on "the latest nuclear rocket systems." Both these developments were seen by some observers as counter-measures to the proposed US missile defense shield. (Space Daily, 2004).

It should be mentioned that the official position of the Russian Federation (as well as that of the former USSR) consistently has been against space weaponization and in support of a treaty banning the stationing of any type of weapons in outer space and renouncing the use or threat of use of force in outer space, from outer space or towards outer space (Skotnikov, 2004). One should note that in 2002, the Russian Federation and China submitted to the Conference on Disarmament a working paper, co-sponsored by other States, entitled "Possible Elements for a Future International Legal Agreement on the Prevention of the Deployment of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects" (contained in the working paper CD/1679).[3] While acknowledging that certain space-based systems in existence today are in fact dual use (such as those for communications, remote sensing and navigation), the Russians however, seem to be of the view that banning all military uses of space would be counterproductive. (Lukiantsev, 2002).

More recently, on 5 October 2004, Russia's permanent representative to the Conference on Disarmament made an important statement, noting that Russia pledged not to be the first to deploy any weapons in outer space and that Russia encouraged all space powers to follow its example (CDI Russia Weekly, 14 October 2004).

C. China

A 2003 Report of the US Department of Defense on the Military Power of the People's Republic of China notes that Beijing leaders believe that US poses a "significant",

[3] It was hoped that the CD would consider this document as a basis for negotiating and concluding an agreement, but to date, no visible progress on this initiative has occurred.

long-term challenge to their country. In March 2002 China announced a 17.5 per cent, or $3 billion, increase in its military budget, although it is not certain how much of that sum was allocated to space hardware. The DoD report estimated that China's annual spending on the military could increase in "real terms" three-to four-fold by 2020. (Sample, 2003). According to the report, China appears to be strengthening its war fighting skills by creating anti-satellite weaponry, building new classes of boosters, as well as improving an array of military space systems. (David, 2003).

Although Chinese officials deny that the government is pursuing ASATs (Zhang, 2004) and is maintaining an anti-weapons in space position, the most recent reports emanating from China make it clear that Chinese leaders see the development of military space capabilities as being of "pivotal importance" and military capabilities as a "key element in the Chinese armed forces modernization program" (Av. Week & Sp. Tech, 15 Nov. 2004).

D. European Union

With the United States for years enjoying a monopoly with its Global Positioning System (GPS), the European Union was increasingly concerned about America's dominance of such a critical system. Expressing the view of other members of the Union, French President, Jacques Chirac stated that Europe did not want to risk of becoming "vassals" to American GPS (Chirac cited in Howland, 2003). In an effort to counter this US space dominance, the EU undertook to develop an independent capability and plans on launching the Galileo constellation of 30 satellites, and have it fully operational by 2008.[4] In regard to space weaponization, the EU is a strong advocate for a space weapons ban and in June 2001 it co-sponsored with Canada a Joint Statement on Non-Proliferation, Arms Control and Disarmaments (Estabrooks, 2002).

E. North Korea

Although in September 1999, North Korea declared a moratorium on missile tests, several reports alleged that in 2003 it undertook two tests of anti-ship missiles into the Sea of Japan (see SpaceDaily News, March 10, 2003). It should be mentioned that on 10 April 2003 North Korea officially withdrawn from the nuclear Non Proliferation Treaty. More recently, North Korea announced that it possesses nuclear weapons and would pull out of the multiparty negotiations aimed at shutting down its nuclear weapons program. These developments will undoubtedly raise the level of anxiety in the region and perhaps everywhere else in the world, given the possibility that North Korea will transfer its nuclear technology to others (Online NewsHour, 10 February 2005).

F. Japan

In reaction to the perceived growing threat from North Korea, Japan announced, in August 2003, its intention to deploy, by 2007, an advanced missile defense system, involving a two-phase, layered missile shield based in existing US technology. These plans are in sharp

[4] It is important to mention that other countries will be participating/contributing to the Galileo effort (China, Canada, India and Israel).

contrast with the previous Japanese missile defense policy which used to stress only precautionary research and development in collaboration with the US (International Institute of Strategic Studies in London, 2003).

G. Other Countries

Canada maintained a firm position on the prevention of an arms race in outer space and it strongly opposes the weaponization of space (UN Press Document, 26 August 2004). France has played an active part in the work of the Conference on Disarmament and came out strongly in favor of the peaceful uses of outer space. In June 2001, the President of France noted that the non-weaponization of space was an essential element which has been maintained this far and should continue. Any other scenario would lead to a new arms race which would be disastrous for everyone (UN Press Document, 26 August 2004). Sweden also constantly expresses its concerns vis-à-vis the risks of an arms race in space (UN Press Document, 26 August 2004).

It is interesting to note that, within the United Nations, the most recent Resolution adopted by the General Assembly on 17 December 2004 on the Prevention of an Arms Race in Outer Space was adopted with no votes against (only 4 States abstained, among which the United States and Israel). This shows a change in position by the US, which in previous years voted against virtually the same text, which "calls upon all States, in particular those with major space capabilities, to contribute actively to the objective of the peaceful uses of outer space and of the prevention of an arms race in outer space and to refrain from actions contrary to that objective and to the relevant existing treaties in the interest of maintaining international peace and security and promoting international cooperation" (UNGA Resolution A/RES/59/065 adopted on 17 December 2004).

It should however be mentioned that several countries expressed their support for, or at least an interest in cooperation with, the US missile defense program, such as the United Kingdom, Israel, Japan, Australia, and India (Foreign Affairs Canada, 2004). Several other nations, including members of the North Atlantic Treaty Organization (NATO), remain non-committal on Bush Administration's plans (Space Daily May 2, 2001). Also, one should note that Canada announced recently that it will not participate in the US missile defense program (CBC News, 23 February 2005) but it will continue its participation in the North American Aerospace Defense Command (NORAD). Other nations express their open disapproval towards the controversial program. Such are Russia, China and Germany, whose leaders repeatedly expressed their concerns that US plans for a national missile defense system may lead to a new international arms race (Space Daily, March 28, 2000).

2.2. International Agreements and Space Weaponization

Although there is no comprehensive international treaty addressing space weaponization exclusively, a fairly elaborated legal framework regulating space activities does exist. Several international agreements apply to military uses of outer space and its weaponization. The agreements in question include the 1963 Limited Test Ban Treaty, which prohibits " any nuclear weapon test explosion, or any other nuclear explosion" in space; the 1967 Outer Space Treaty which requires the State parties not to place in orbit around the

Earth any objects carrying nuclear weapons or any other weapons of mass destruction, not to install such weapons on celestial bodies, and not to station such weapons in outer space in any other manner; and the 1979 Agreement on the Activities of States on the Moon and Other Celestial Bodies, which imposes a ban of any weapons to the celestial bodies. A major contribution to the idea of a weapons-free outer space was made by the 1972 US-Soviet Union Anti-Ballistic Missile (ABM) Treaty, which obliged the two countries, *inter alia*, not to develop, test, or deploy ABM systems or components that are space-based (but not anti-satellite weapons) and not to interfere with the national technical means of verification of the other party. However, the US withdrawal from this treaty, effective on 13 June 2002), rendered this prohibition moot.

An additional set of limitations can be found in the 1977 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Techniques, which prescribes that no State Party is allowed "to engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party," where the term "environment" includes outer space. Also, it should be mentioned that the 1932 International Telecommunication Union (ITU) Convention, as amended in 1992, 1994 and 2002 protects civilian satellites from interference.

One should also mention that the numerous UN General Assembly resolutions calling for the continued peaceful use of space and the prevention of an arms race in space. Over the years, the texts of these resolutions contain the same language. Although the UN resolutions are not binding and thus have no direct power to regulate space activities, it is argued that given their repeated, consistent provisions and the nearly unanimous vote in favor of their adoption one may argue that an international norm prohibiting the weaponization of space is emerging (Union of Concern Scientists, 2003).

To summarize, the following outer space activities are considered non-peaceful and thus are prohibited under the current international law (Vlasic, 1991):

- Placing nuclear weapons in orbit around the Earth or on celestial bodies or anywhere else in outer space (Article IV, Outer Space Treaty -OST; and Article III, Moon Agreement);
- Placing weapons of mass destruction in orbit around the Earth, on celestial bodies or anywhere else in outer space (it is generally accepted that in the category of "weapons of mass destruction" are included biological and chemical agents, now expressly prohibited by the Biological Weapons Convention and the Chemical Weapons Convention).
- Establishment of military bases and installations, the testing of any kind of weapons and the conduct of military maneuvers on the moon and other celestial bodies (Art. IV, para. 2, OST; Art. III, Moon Agreement)
- Carrying out any nuclear weapon explosions, or any other nuclear explosion, anywhere in outer space (Limited Test Ban Treaty, Art. I.1(a))
- Military or hostile uses of environmental modification techniques that could produce widespread adverse effect on the human environment, which includes both the

Earth's atmosphere and the surrounding outer space (ENMOD Convention, Arts. I and II).

- Any hostile act, committed by a device designed to operate in outer space, that causes damage to the assets of another State located in outer space (General International Law; United Nations Charter, Article 2(4); UNGA Resolution 3314 (XXIV) of 4 December 1974, on the Definition of Aggression, Articles 3 and 4).
- Any intentional physical interference, whether or not resulting in damage, with space assets of another State located in outer space without that State's authorization (e.g., unauthorized inspection of another State's satellite) (general international law, OST Arts. III, VI, VIII, and IX).
- Any intentional electronic interference with civilian satellites (ITU Constitution, Arts. 38, 45 and 48; ITU Radio Regulations, Arts. 4, 15 and 22).

Thus, under the existing regime, among the unregulated and therefore non-prohibited activities in outer space one can mention, *inter alia*: (Skotnikov, 2004):

- development, testing and deployment of anti-satellite weapons;
- development, testing and deployment of space-based non-nuclear missile defense systems and their components;
- creation and deployment in outer space of means of optical jamming of space-, air- or ground-based technical assets.

Section 3. The Debate over Space Weaponization

Recent US policy documents putting forward concepts related to space warfare rekindled the old debate concerning weaponizing the space. Some detect more than the two extreme positions on the issue. For example, Peter Hays, an expert in the field of space weapons, has identified four camps in the debate over the placement of weapons in space. The first contends that the US military cannot operate nearly as effectively as it has in the last decade without the unobstructed access to space the United States currently enjoys. A second camp argues that the weaponization of space is inevitable, as the 2001 US Space Commission concluded. A third camp understands the importance of space to US force projection and desires to preserve the status quo. In the fourth camp are those that Hayes calls "space doves". The "doves" believe that space should be off limits to military uses and might even support the removal of current military navigation, communication, and imagery satellites. (Hayes, 2002).

A. Selected Arguments for Weaponization

The American proponents of space weaponization argue that developing and maintaining core space control functions of situational awareness, defensive counterspace and offensive counterspace would assure freedom of action in space and thus would enhance warfighting capability. Space superiority is becoming now what was in the past the key element of air superiority for a successful military mission (Gillis, 2003). This is why the US must reach for space dominance and one way to attain it is through "leading-edge space-system technology" (Elliot, 2004) which may include space weapons.

In addition, it is argued that the US has legitimate interests in space and, thus, it should be free to protect its access to space and its assets in space, both civilian and military. The apparent vulnerability of the space assets, so susceptible to attacks or hostile interference, and their integrated role in both military and vital civilian systems, make them a very appealing target for a Space Peal Harbor scenario. Strategic logic would argue that the greater American economic and military dependence on near-Earth space is, the greater motivation potential adversaries will have to destroy or at least cripple those economic and military advantages (Watts, 2001). It is noted that it is relatively cheap and requires low-technology to detonate a nuclear weapon in low Earth orbit. The resulting electromagnetic pulse (EMP) could potentially disrupt US reconnaissance, communication and early warning satellites as well as US commercial satellites (Moore, 2001). Especially given the latest statements regarding North Korea's nuclear weapons system, protecting one's space assets should follow as a clear necessity.

Another path leading to gradual space weaponization could result from the development of Earth-based ASAT weapons by the United States, China, Russia, or some other States, like North Korea, for example. Any nation that has space assets will be faced with the threat of survivability of its satellites and might consider deploying weapons in orbital space as an effective counter measure or deterrent (Watts, 2001). Steven Lambakis, a leading proponent of weaponizing space, asks rhetorically whether space should be treated any differently from the land, sea or air? He answers in the negative, stating that, in his view, despite physical differences between the Earth and space environments, there should be no difference from the point of view of policy and strategy. According to his opinion: "Should military requirements warrant and cost permit, space weapons could be invited to join the rest of the arsenal…" (Lambakis, 2001).

Following the same line of argument, some proponents of weapons in space consider that placing in orbit and using weapons is unavoidable; since every medium – air, land and sea - has seen military conflict, it is asserted that it will be no different for space (Watts, 2001). Sooner or later, space will be weaponized so it is important to take the lead in this process in order to gain military advantage (Watts, 2001).

3.2. Selected Arguments against Weaponization

A study undertaken in 2002 by a panel of scientists assembled by the Federation of American Scientists sought to determine whether deploying weapons in space was the best defense against any plausible threat. After considering a wide range of vulnerabilities of US space assets and the capabilities of various space-based weapons, the Panel suggested that it was not in the security interest of the US to place weapons in space in the next five years. The Panel also considered the usefulness of space weapons to attack ground targets. It was unanimous in concluding that ground-based weapons are more effective, more technically feasible, and carry a lower financial and political cost than do space-based weapons. The Panel considered also the political implications of placing weapons in space and it concluded that in cases where ground-based weapons offer equivalent capabilities, then US strategic interests are better served by avoiding placement of weapons in space. (FAS Report, 2004).

The potential vulnerability of the space weapons is addressed by Bruce DeBlois, editor of *Beyond the Paths of Heaven: The Emergence of Space Power Thought*, who claims that such arms could become "sitting ducks in orbit", thus giving the United States a new weakness, not a new strength. Satellites are already becoming a weak "center of gravity" in US military planning since they are vulnerable to electronic jamming, orbiting debris and electromagnetic pulse. As a consequence, weaponizing space would be militarily and politically self-defeating, costly and provocative both for the potential enemies as well as allies (DeBlois, 1998). Similar arguments are brought by US Maj. William Spacey II who has examined these issues and argues that because the US has made such advancement in weapons development it need not feel threatened if other nations weaponize space first. He also notes that space weapons would be costly, and there are ground based options that might be just as effective, so pursuing space weapons programs makes little strategic sense. (Spacey cited in Estabrooks 2002)

Another argument against weaponization holds that weaker adversaries would seek to nullify US military superiority by attacking or disabling US space assets that have become essential for the conduct of military operations (Krepon, 2004). Theresa Hitchens, vice-president of the US Center for Defense Information, expressed her doubts that other countries will take well the US efforts to weaponize outer space. In her view: "It is almost inconceivable that either Russia or China would allow the United States to become the sole nation with space-based weapons" (Hitchens, quoted in Schachtman, 2004). Many experts agree that if US military domination in space continues, other nations may feel under irresistible pressure to allocate appropriate technological and financial resources to counter or offset the growing US superiority in space arguably leading to a "space arms race" (Johnson, 2003).

Already a series of reports warn that if the US is taking its ballistic missile defense (BDM) plans to include airborne or space based lasers, as it is scheduled after 2008, China and Russia are likely to react in kind. (Nemets, 2004). Some observers call this space-based dependence of the US as its Achilles Heel (Hasting, 2004). In addition, as will be shown below, weapons testing and use creates space debris, which may disrupt both military as well as civilian uses of near-Earth orbits. To summarize – in short, it has been argued that space weaponization will disrupt international stability and global commerce; and negatively impact military strategic balance, alliance ties and relations among major powers. It could actually create more threats to than protection for space assets (Skotnikov, 2004).

Section 4. Reasons for Increased Public Awareness: Why Should We Care?

Both proponents and opponents of weapons in space have their reasons to promote their arguments to the public and political representatives. The proponents of space weapons point out towards the risks posed to space assets by hostile attacks and the need to protect these valuable assets. As space-based technologies play an increasingly important role in the global community, possible disruptions of normal operations of satellites and spacecrafts would affect, directly or indirectly, everybody's life. One must keep in mind that more than 130 States currently participate in outer space activities, either by conducting their own space programs or by devising programs that use information provided by outer space assets (Skotnikov, 2004). As

shown above, satellites have become essential, providing wireless communications, Internet, satellite television and radio. Remote sensing satellites have important applications as well, such as providing input for urban development and agricultural projects, monitoring weather and climate change, and tracking natural and man-made disasters (e.g., forest fires, oil spills, floods, and even – as the recent tragedy in South Asia showed –the consequences of Tsunamis). Disruption of such essential services would impair global commerce since a growing number of companies depend on space-aided commerce (Krepon, 2004).

The opponents of weapons in space argue that the flight-testing, deployment and use of space weapons pose a significant threat not only to military uses of outer space, but also to space exploration and other peaceful uses of space. Furthermore, using anti-satellite weapons would exacerbate the problem of space debris, defined by NASA as "any man-made object in orbit around the Earth which no longer serves a useful purpose" (Johnson, 2003). According to a report by UNESCO made public in London on 28 April 2002, there were about 2.7 tons of various missile fragments in orbit. (Lukiantsev, 2002). US Space Command's Space Catalogue currently tracks some 9,000 man-made objects in orbit, ranging in size from 10 cm in lower orbit to over 1 meter in geo-stationary orbit. Approximately 94 per cent of these objects are considered space debris and a hazard to satellites and other spacecraft. With this material flying at speeds of almost 8 km/s (which is ten times more than that of a rifle bullet), a collision with a functional space object would cause it serious damage or even destruction. (Mehrholz et al., 2002). Weaponization of space would only worsen the debris problem and could jeopardize the possibility of further space explorations and severely impair both civilian and military uses, including communications systems. In addition, even a small number of "hits" in the lower orbits could create sufficient debris to cause a cascade of further collisions and fragmentation. (Levy, 2002). Eventually, this accumulation of debris could interfere with the Sun light (since Sun's rays reflect off the dust) and lead to serious damage to Earth's environment as a result of a permanent light pollution. (Primack, 2002).

One should note that, despite the potential risks posed by the expected deployment of space weapons, the commercial satellite sector has remained fairly quiet in the debate about the weaponization of space (Estabrooks, 2002). Some argue that this silence is the result of conflicts of interest between companies with both military and commercial investment in space, and a general disbelief that space weaponization will become a reality in the near future (Moltz, 2002). Similarly, the general public does not seem to actively participate in the debate over weaponizing the space despite its obvious interest in the outcome. Although President Reagan's "Star Wars" program and ballistic missile defense have received significant media attention, current developments in national space programs seem to preoccupy few. It has been argued that the September 11 attacks on the World Trade Center, the war in Iraq, and the "war on terror" so preoccupy public interest to make the risks of weaponization of space seem too remote to be considered a priority for civil engagement and political action now. Yet history has taught us that by the time a certain military doctrine becomes well entrenched, it is usually too late to intervene and stop its application in practice (Johnson, 2003). Given the current positions of the major space powers concerning space weaponization, it is the right time to encourage an open debate on this issue involving governments, industry, space users and explores, and informed, concerned citizens. (Johnson, 2003). The scientific and commercial space sectors, the general public, and States with and without major space assets, should have an interest in this debate given their security, political, economic and moral stakes in the issue of space weaponization.

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