ESD.132J
Law, Technology, and Public Policy
Final Research/Analysis Paper

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5/17/02

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Description:

The legal framework for controlling military uses of space was codified over 30 years ago. At that time, the primary focus was on preventing the United States (U.S.) and the Soviet Union, in the midst of the Cold War, from putting weapons of mass destruction in space, and extending their national rivalries above the earth.[1] Since that time, the Cold War has ended, and the Soviet Union no longer exists. The United States and Russia are now cooperating in ways never envisioned when the treaties were drafted. The global strategic balance has shifted from two space-faring superpowers, to a plethora of space actors. Additionally, advances in technology are challenging the original intent of the treaties.

The United Nations (U.N.) is the primary organization responsible for creating the legal structure governing space weapons. As a result of the consensus building procedure by which the U.N. treaties are drafted, ambiguous language often gives little guidance in addressing the legality of possible space-based weapon systems.

The United States is more dependent on space than any other nation.[15] The space-based infrastructure for both commercial and military purposes is highly vulnerable to attack. The U.S. is investigating options to protect its space-based assets against hostile acts, and to negate the hostile use of space against U.S. interests.

With the U.S. withdrawal from the Anti-Ballistic Missile Treaty (ABM), there are no formal legal barriers preventing the United States, or any other nation, from placing anti-ballistic missile weapons in space, so long as they are not "weapons of mass destruction."

This has allowed the United States to pursue an ambitious National Missile Defense (NMD) program. Although the declared intention of this system is to protect the U.S. and its allies from ballistic missile strikes launched accidentally, or by so called rogue nations, the eventual multi-layered defense system envisioned by the Pentagon would also protect space-based assets.

The confounding of these needs – ballistic missile defense and space asset protection – has driven the U.S. toward space-based weapons.

This paper will address the historical evolution of space law as it pertains to the militarization of space, examining the causes of failure of previous proposals to limit or ban weapons in space. It will focus on specific legal strategies intended to force technology in such a way so as to provide adequate protection to the space infrastructure, without the need for space-based weapons, and address potential obstacles to achieving this goal.

Key Questions:

To what extent can a NMD system be developed before violating the current international law?

How can law encourage the development of a robust space infrastructure without need for space-based weapons?

Key Stakeholders:

The United Nations, and member states; In particular – Preeminent space-faring nations: the United States, Russia, Europe (the European Space Agency) and Japan; Developing space-faring nations: China, India, and Isreal; Rising space-faring nations: Brazil and Pakistan

Problem Type:

Technology development in a socially beneficial way: To promote the development of robust space system architectures and the continued use and development of space by scientific and commercial interests.

Controlling adverse effects of technology: To prevent a buildup of weapons in space and preserve the intent of the 1967 Outer Space Treaty, a new multilateral agreement prohibiting space-based weapons is necessary.

Ethical Dilemma: The United States has made clear its intentions to develop a multi-layered anti-ballistic missile system. Such a system may one day incorporate space-based weapons to defend the space infrastructure and protect against ballistic missiles. Could this system evolve into an unethical use of space?

Legal Jurisdiction of Space:

U.N. General Assembly

Given that the use and development of space is by its very nature a global activity, the United Nations seems an appropriate body in which to promulgate space law. Under Article 13(1)(a) of the U.N. Charter, the General Assembly is empowered to "initiate studies and make recommendations for the purpose of: a)…encouraging the progressive development of international law and its codification."

Scope of Authority

Although the General Assembly does not have the authority to pass binding resolutions, often resolutions are accepted as common law. Additionally, passage of a resolution sets the official policy of the U.N.

UNCOPUOS

In response to the Soviet launch of Sputnik in 1958, the United Nations General Assembly passed Resolution 1348 (XIII), creating the United Nations Committee of the Peaceful Uses of Outer Space (UNCOPUOS). UNCOPUOS was charged with the responsibility to codify substantive international law in the form of treaties. The committee of 24 nations included members from Soviet bloc states, Western democracies, Arab states and American states. With such a diverse group of nations, there were disagreements as to how to decide when they had converged on an acceptable treaty.[4] Through a compromise, it was agreed that space law issues would be decided by consensus, instead of by majority. This required that no nation reject the provision before the committee. Abstentions did not break consensus. Additionally, a nation was allowed to accept a provision under its own interpretation, provided that the interpretation went on record. During the Cold War, the United States and the Soviet Union were able to use this feature to "bend" certain provisions as they saw necessary.

Scope of Authority

In the early days of space exploration (roughly 1967-1975), compromises on provisions were achieved as trade-offs so that the law kept pace with the rapidly advancing technology and progress being made by the United States and Soviet Union.[1] Within that time period, four treaties were agreed upon: the Outer Space Treaty, the Rescue Agreement, the Liability Convention, and the Registration Convention. However, as the value of space exploration and utilization became more evident, many nations sought membership in UNCOPUOS.[1] By 1982 the committee had increased in size to 52 members. The increased size has made it much more difficult to achieve consensus. In fact, only one treaty, the Moon Treaty, has been agreed upon since 1975. The consensus requirement often resulted in general wording of the treaties, leaving ambiguities in their legal interpretation.

U.N. Conference of the Committee on Disarmament

The U.N. Conference on Disarmament (CD) was established in 1979 as "the single multilateral disarmament negotiating forum of the international community."[20] Its unique relationship with the U.N. has allowed it to adopt its own Rules of Procedure, and set its own agenda. However it takes into account the recommendations of the General Assembly and the proposals of its members in setting the agenda.

The CD is governed by the President and Secretary General of the Committee. Both are appointed annually, in cyclical order of member nation representatives. Sixty-Six nations are represented, including the nuclear states. A primary focus of the CD is the prevention of an arms race in outer space. Decisions are also reached by consensus.

Formal Treaties Pertaining to Space Militarization

The Outer Space Treaty of 1967

The 1967 Treaty on Principles Governing the Activities of States in the Exploration and Uses of Outer Space, Including the Moon and Other Celestial Bodies provides the basic framework upon which international space law is founded. The idealistic language of the preamble, in which "the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes" is recognized, sets the tone for the treaty. Article I, which states: "The exploration and use of outer space shall be carried out for the benefit and in the interests of all countries. Outer space shall be free for exploration and use by all States *without discrimination of any kind*," [emphasis added] is a difficult statement to evaluate from a legal perspective. For example, is it necessary that all space missions be beneficial and in the interests of all countries in order to be legal? Although Article I is often treated as a philosophical and moral goal, rather than enforceable substantive law,[1] the phrase "without discrimination of any kind" may come to bear on any proposed space-based defense system.

Article II declares: "Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means." This article may also play a critical role in determining the legality of a space-based defense system.

Article IV defines two zones, which are governed under different legal regimes for the military uses of space. It reads: "States Parties to the Treaty undertake not to place in orbit…any object carrying nuclear weapons or any other kinds of weapons of mass destruction. The moon and other celestial bodies shall be used…*exclusively* [emphasis added] for peaceful purposes…the testing of any type of weapons…on celestial bodies shall be forbidden.

The Treaty in Practice

While the moon and other celestial bodies are to remain totally demilitarized, open space may be partially militarized, provided the weapons are not nuclear or classified as weapons of mass destruction. The CD has described and defined weapons of mass destruction as biological, chemical, or nuclear. Lasers, particle beams, or other advanced weapons systems are not specifically prohibited in space.

Although partial militarization of space may seem contradictory to the use of space for "peaceful purposes" and the "benefit of mankind" as stated in the preamble, the majority view rejects this contention. The United States, Russia, and a number of other space-faring nations have taken the position that the "peaceful purposes" provision in the Outer Space Treaty should be interpreted as "non-aggressive purposes." This has enabled the justification of reconnaissance satellites as a stabilizing force, providing a "national technical means" to verify compliance with various arms reduction treaties. Additionally, the United States has argued that by extending the U.N. Charter to Article III of the Outer Space Treaty, it is entitled to the right of self-defense, including "anticipatory self-defense."

The Moon Treaty of 1979

The Treaty Governing the Activities of States on the Moon and Other Celestial Bodies (the Moon Treaty of 1979) reiterates the principles of the Outer Space Treaty and the Charter of the United Nations, and extends those principles more specifically to the legal uses of the moon. It is significant because it challenges the U.S. contention that military and civilian uses cannot always be easily be separated (as in the case of the Global Positioning System), and that "peaceful purposes" should be interpreted as "non-aggressive purposes." Article III attempts to clarify the meaning of "nonmilitary," as used in the Outer Space Treaty, through a detailed exposition of scenarios. Section 2 states: "any threat or use of force or any other hostile act or threat of hostile act on the moon is prohibited." However, this provision does not clarify whether a weapons system, intended for defensive purposes but capable of attack (i.e. shooting down an enemy missile), constitutes a "threat of force" or a "hostile act."

The Treaty in Practice

In practice, the Moon Treaty has only had marginal significance because no major space-faring nation ratified the treaty. This is because by 1979 UNCOPUOS had grown so large it was effectively immobilized.[1] To reach a consensus, the language of the provisions had to be iterated until they became sufficiently ambiguous that no nation objected. Tensions were high between the United States and the Soviet Union, and in the absence of a more stringent treaty, they each began arming themselves in space. In response, Brazil, Egypt, Nigeria and Yugoslavia presented strong declarations against this trend at the 1982 UNISPACE conference. However, it was again not possible to reach a consensus on a statement that military uses of space were inherently evil[1], and so the U.S. and Soviet Union continued their arms buildup in space.

USSR Space Weapons Treaty of 1981

The first launch of the U.S. space shuttle occurred on April 12, 1981. In August of that year, the Soviet Union, alarmed by the military potential provided by a reusable manned vehicle, proposed the far-reaching Treaty on the Prohibition of the Uses of Force in Outer Space and from Space Against the Earth, banning all weapons from space. Article II(5) specifically prohibits the use of "manned spacecraft for military, including anti-satellite, purposes." Other provisions of Article II propose the prohibition of "testing and deployment of space-based weapons for the destruction of objects on Earth, in the atmosphere, or in outer space." Additionally it called for the cessation of development of new anti-satellite systems, and destruction of any existing systems. Notably, however, the treaty did not specifically mention anything about the use of force from the Earth against objects in outer space.

Rejection of the Treaty

The United States, among other nations, did not accept the treaty (nor a 1983 revised draft) on grounds that the verification provision was too weak. Article IV proposed verification based upon "national technical means" (i.e. reconnaissance satellites). The absence of an acceptable international monitoring agency made any new treaty regarding weapons in space unlikely.

As a result of the inadequate means of verification and distrust between the U.S. and the Soviet Union, President Regan launched the Strategic Defense Initiative (SDI) in 1983. SDI was intended to develop the technology required for a space-based system to defend against ballistic missiles. The government began investing heavily in advanced technologies, including automated space vehicles and powerful lasers capable of destroying ballistic missiles from space. These systems are beginning to come to fruition in proposed NMD architectures, however there are still large uncertainties in their ultimate capabilities. In response to SDI, the Soviet Union abandoned its efforts to secure a treaty banning weapons in space and began developing its own strategic defense systems.

Proposals for International Monitoring Agencies

In 1978 the French government proposed the International Satellite Monitoring Agency (ISMA) for the purpose of advancing disarmament efforts by providing a means of verification from a neutral party. Although the agency, which would have been part of the U.N. was not envisioned to operate any reconnaissance satellites of its own, it would rely on states which do possess them. Section II(b)(21) describes the proposed operating procedures for the ISMA: "A State could report to the Agency when it had good reason to believe that an agreement to which it was a party was being infringed by another State or when the conduct of that other State jeopardized its security. The Agency, in order to proceed to an investigation, should then obtain the consent of the State to be investigated."

Failed U.S. Support

The Soviet Union supported the French proposal in 1978, and proposed a similar agency, the World Space Organization, in 1986. However, the U.S. rejected both the French IMSA and the Soviet WSO, citing fears that the agency would be come politicized.

The Anti-Ballistic Missile Treaty

Unlike the previously mentioned multi-lateral U.N. treaties, the bi-lateral Treaty on the Limitation of Anti-Ballistic Missile Systems written to address issues specific to U.S. and the Soviet relations.

The nuclear strategic balance of the Cold War hinged on the principle of Mutual Assured Destruction (MAD), which assumed that neither side would strike first because each

possessed enough offensive nuclear capability to absorb the attack, and retaliate against their attacker. The limits placed on anti-ballistic missile systems by the treaty sought to leave each side vulnerable, and thus kept MAD tenable.

Despite the treaty, both the Soviets and the U.S. were developing basic technologies for eventual use in anti-ballistic missile systems. With the end of the Cold War, and a new era in U.S.–Russian relations (most notably its limited incorporation into the North Atlantic Treaty Organization), the focus of missile defense shifted from protecting against potentially thousands of Soviet missiles, to protecting against an accidental launch or a limited strike by a third-world country or non-state actor. Since Article III of the ABM treaty allowed each country to deploy up to 100 ABM interceptor missiles, it was possible to develop a ground based ballistic missile defense system to address this threat without violating the ABM treaty. Nonetheless, as permitted under Article XV, the U.S. announced its intention to abrogate the ABM treaty in 2001.

This is an indication that the treaty was impeding technological development by constraining the options available for the National Missile Defense program. Indeed, Article V specifically prohibits the development, testing, or deployment of space-based ABM systems.

Definition and Strategic Value of Defensive Systems:

In this section I will explain the value of defensive systems and offer legal definitions for the classification of these systems for use in a proposed treaty.

Deterrence can be achieved through defensive systems by increasing the uncertainty that an attack will successfully achieve some end, thus discouraging the potential attacker. The main components of the uncertainty the potential attacker is faced with are risk (a certain probability that the attack will fail,) and indeterminacy (the result of knowing that the attack may fail, but not knowing what the likelihood of that failure is.) Thus a defensive system need only be *apparently* reliable to have strategic value.

There are two types of defensive systems: 1) Purely defensive (non-aggressive) systems that do not necessarily impede an aggressor's ability to strike the system, but are sufficiently robust to the impact of the attack to survive; 2) Aggressive defensive systems that are capable of (pre-emptive) strike or counter-attack.

The Rumsfeld Report:

The 2001 Report of the Commission to Assess United States National Security Space Management and Organization, commonly known as the Rumsfeld Report, outlines the Pentagon's space posture for the 21st century. It identifies three key points of national interest in space: 1) To promote the peaceful use of space. 2) To use the nation's potential in space to support its domestic, economic, diplomatic and national security objectives. 3)

To develop and deploy the means to deter and defend against hostile acts directed at U.S. space assets and against the uses of space hostile to U.S. interests.[15]

Although the "peaceful use" of space is listed as the first key point in the U.S. national interest, the report reiterates the U.S. interpretation of the Outer Space Treaty as providing "both self-defense and non-aggressive military use of space." Plans to demonstrate the Space Based Laser's capability to destroy a ballistic missile in 2012 suggest that the U.S. interpretation of "non-aggressive" is counter to the definition I have proposed.

U.S. National Missile Defense System Architectures:

The U.S. National Missile Defense may pose challenges to the Outer Space Treaty depending on its ultimate capability and architecture. Specifically, if NMD evolves into a global space-based aggressive (as I have defined it) system, questions arise on two fronts 1) regarding the non-appropriation of space: "by means of use or occupation, or by any other means," prohibited by Article II; 2) by the non-discrimination of access to space guaranteed by Article I.

To understand how a proposed space-based defensive system may be implemented, and how the law may come to bear on the issue, we must first examine the operating modes of a ballistic missile.

Ballistic Missiles

Ballistic missiles are typically launched from ground or sea-based sites. The trajectory of a ballistic missile can be divided into three phases.

Phase I - Ascent

When the missile is launched, it is at its most vulnerable for three reasons: 1) The brilliant intensity of the exhaust plume in the infra-red spectrum makes it easily detectable from space-based reconnaissance satellites, so heat-seeking missiles can hone in on the missile; 2) It does not yet have a large velocity; 3) The launch vehicle is large, fragile, and full of fuel, making it relatively easy to destroy.

However, the boost phase lasts only two to five minutes, leaving little time to authorize countermeasures and destroy the missile.

Phase II – Midcourse

Once the launch vehicle has imparted sufficient momentum to the payload and burned out, the payload travels on a ballistic trajectory through space. Without the launch vehicle, the payload is no longer easily detectable through passive means. It is necessary to illuminate the payload, typically accomplished with a ground-based radar, in order to

track its position. At this stage the payload is moving at a rapid velocity (several km/s) and may deploy multiple re-entry vehicles, either decoys or multiple warheads, each of which is capable of following somewhat different ballistic trajectories. This stage lasts approximately 20 to 30 minutes, depending on the range of the intended target.

Phase III - Terminal

As the warhead(s) reenters the atmosphere it is moving at its maximum velocity toward its intended target. The terminal phase typically lasts less than a minute, ending as it strikes its target.

2004 NMD Architecture

The NMD architecture currently slated for deployment as early as 2004 is composed of 1) space-based launch detection satellites 2) ground-based radars to illuminate the warhead(s) in the midcourse phase 3) five ground-based missiles in Alaska, tipped with "kill-vehicle" interceptors designed to destroy warhead(s) by kinetic impact.

This system does not pose any conflicts with the existing treaties. However, President Bush has promised a "multi-layered" defense architecture, where no single system is expected to provide complete coverage. It would be capable of destroying ballistic missiles in all three phases of their flight profile. Ultimately, the NMD "network" may be composed of multiple independent systems, each potentially composed of multiple elements based on land, sea, air and space. The space component would also be used to defend the space infrastructure from anti-satellite weapons or other hostile threats, thus creating an NMD/Space Asset Protection network. This type of architecture may not be permitted under Articles I and II of the Outer Space Treaty.

Potential Scenarios of NMD Conflict with Outer Space Treaty

Depending on the ultimate capability of the NMD network, and its perceived purpose by the international community, it may come into conflict with the Outer Space Treaty. To address the "perceived purpose" issue, I will outline three possible motivations for the NMD system below.

1) To deter a launch against the U.S. and reduce damage in the event of a failed deterrence:

This appears to be the purpose of the 2004 NMD architecture deployment. The strategic value of the system is not strongly correlated with the technical performance of the system so long as it is perceived to work above perhaps 40% reliability (depending on the risk proclivity of the aggressor, of course). The U.S., in light of the uncertainty in the technical performance of the system, would also be deterred from excessive projections of force onto nations with ballistic missile capabilities. However, in the event of a launch against the U.S., it is better to have some technical capability to destroy the missile than

none. International perceptions of such a system, even if it is thought to be fairly reliable (70%), would probably be tolerant of the system.

2) To deter developing countries from spending scarce resources to develop missiles:

The 2004 NMD architecture at modest technical reliability may also be effective at achieving this goal for similar reasons outlined above. Additionally, because the 2004 NMD architecture interceptor missiles are based in Alaska and of a limited range, a developing country would not be subject to American projections of force if it decided to develop missiles for the purpose of launching a satellite into space. Because the 2004 NMD architecture will only have the capability to strike missiles at a limited range, this type of system will also likely be perceived positively by the majority in the international community.

3) To protect the space infrastructure and grant the U.S. freedom of action:

A NMD architecture providing extremely high technical reliability (+99%) will allow the U.S. to project its force with impunity from ballistic missiles. A NMD system architecture capable of providing such a high technical reliability would likely be composed of many independent systems, and capable of making multiple attempts at destroying the incoming payload at various points in the missile's trajectory. The international community would likely regard such a system as threatening if not hostile, especially if it was shown in operational testing to be capable of a pre-emptive strike.

Nations may make strong arguments that an NMD architecture with this level of global capacity is in violation of the Outer Space Treaty Article II, on the grounds that the U.S. has appropriated control over space. Because this system has an unlimited range, and thus capability to deny access to space, it challenges the notion of space access for all nations granted by Article I.

The U.S. has declared its intention to pursue such a system. Perhaps NMD will prove to never provide the extremely high technical reliability required to grant complete freedom of action, but the very existence of global protection (most certainly provided by space-based systems) even at modest reliabilities, will likely be perceived as aggressive and threatening, both militarily and by the potential for commercial blackmail, and infringe upon the Outer Space Treaty.

Desired Transformation for which Law Plays a Key Role:

A limited NMD program capable of intercepting only missiles imminently threatening the U.S. may coexist with a separate strategy to protect space based assets. Prohibition of space-based weapons either under the Outer Space Treaty, or through a separately negotiated treaty may force the technology required to decouple the needs for NMD and space asset defense.

The Status Quo

If aggressive defense systems capable of providing global coverage are permitted, the U.S. will likely deploy many space based laser satellites to shoot down both ballistic missiles and any threats to the space infrastructure. With this protection, the infrastructural satellites (communications, meteorological, intelligence, etc.) will not experience any pressure from emerging threats to change from the status quo in satellite design.

Technology Driving Opportunities

However, if space based lasers (or other systems that can provide global defense coverage) are not permitted under Articles I and II of Outer Space Treaty, infrastructural satellite design will be forced to respond to the emerging threats. Under this circumstance, two possible architectures will likely emerge.

Slight Variations

Satellites may be forced to incorporate certain self-defensive mechanisms. These could involve periodically releasing chemicals or electrically charged particles designed to detect or incapacitate (through contamination or electrostatic discharge) potential anti-satellite weapons positioned nearby. Or, perhaps small, "guardian" (anti-anti-satellites) satellites designed to intercept an incoming missile or destroy an anti-satellite weapon. Although these defense mechanisms will likely involve a certain modification of the status quo satellite design, the overall impact on the infrastructure itself would be minimal.

Fundamental Infrastructural Change

Perhaps the most intriguing impact the law could have on infrastructural satellite design would be to force an architectural shift in the space-based infrastructure itself. By prohibiting long-range defensive weapons in space, the aerospace industry may be forced to adopt technological concepts from the field of computer networking. By replacing a functional satellite with a functional system, composed of many small and distributed satellites, it may be possible to adequately defend the space infrastructure with purely defensive systems in conjunction with an international law prohibiting all weapons in space.

I will address the willingness, opportunity, and capacity of the United States to adopt this strategy of space infrastructure defense, in conjunction with a limited NMD system in the following sections.

Willingness:

The Rumsfeld report states: "To achieve national security objectives and compete successfully internationally, the U.S. must maintain technological leadership in space. This requires…an attitude of risk-taking and innovation, and government policies…[that] significantly increase its investment in breakthrough technologies to fuel innovative, revolutionary capabilities." Although the report clearly indicates the Pentagon's

intentions to develop space-based weapons, the statement can be interpreted as generally open to the innovation of changing the architecture of the space infrastructure.

However the report also anticipates that "the U.S. will be tested over time by competing programs or attempts to restrict U.S. space activities through international regulations. The Commissioners appreciate the sensitivity that surrounds the notion of weapons in space for offensive or defensive purposes. They also believe, however, that to ignore the issue would be a disservice to the nation. The Comissioners believe the U.S. Government should vigorously pursue the capabilities to ensure the President will have the option to deploy weapons in space to deter threats to and, if necessary, defend against attacks on U.S. interests." Clearly abandoning space-based weapons will require substantial negotiations with the Pentagon.

However, perhaps the Pentagon should re-evaluate the vulnerability inherent in a single-point-failure infrastructure in view of the fact that technology dissemination and transfer between nations will lead to the proliferation of space-based weapons unless they are prohibited by international law. Additionally, considering the substantial technical uncertainties associated with space-based weapons, defense analysts may wish to make a decision intended to minimize regret in the worst case scenario, in which there is a proliferation of space-based weapons among countries hostile to the U.S. and there is no space-based laser to counter them. Furthermore, there is a chance that one war in space could cause so much orbital debris that it would no longer even be possible to maintain a space-infrastructure, forgoing all commercial and scientific benefits of space for hundreds of years.

The U.S. Congress may be persuaded to abandon the space-based component of NMD in view of the diplomatic opportunities and long-term security a multilateral prohibition on the use of space-based weapons would bring. However, the Bush administration has exhibited an acute aversion to treaties in general, and especially toward multilateral treaties. Additionally, it often appears that the multi-layered NMD concept is being pursued with an ideological fervor in homage to Ronald Reagan's vision for SDI.

Historically, the U.S. has rejected space weaponization treaties on the basis of insufficient means for verification of compliance. However, this was during the Cold War. Improved diplomatic relations with Russia, and vastly superior reconnassaince technology compared to all other space-faring nations may make the U.S. more willing to enter an agreement.

Russia and China have each proposed to prohibit the use of space-based weapons for national missile defense.[16] France has expressed reservations about banning weapons in space,[1] but could likely be pressured by the U.S. and other European states supportive of a ban. Japan, as a peaceful nation, would almost certainly support a ban on weapons in space. However, some minor and non-space fairing nations may resist the idea of a ban since they have little or no assets to lose. A country could conceivably blackmail space-faring nations with space-based weapons, although it would certainly not be in that

country's long-term interest, given the economic, military, and political power of most large space-faring nations.

Opportunity:

Although the technologies required to realize a multi-layered NMD, including space-based lasers, are still in development and their eventual performance uncertain, miniaturization of the satellite industry has been advancing rapidly and reliably. Micro-satellites (on the order of 100 Kg), and nano-satellites (on the order of 10 Kg and smaller), will likely continue to reduce in size, while at the same time increase in capability due to the increasing performance of computer technology.

Also, if the U.S. seizes the opportunity to embrace a treaty banning space-based weapons, while forcing small satellite and distributed networking technologies, U.S. commercial companies (who also build government satellites) might enjoy a "first mover advantage" over international competitors, and provide their customers with the flexibility and reliability distributed networks allow.

A treaty banning-space weapons could be proposed to the U.N. at any time.

Capacity:

The United States, as the world's only superpower and most heavily invested nation in space certainly has the capacity to develop the technologies required to revolutionize the space infrastructure and win the political support to pass a treaty banning space-based weapons. However, internal resistance may pose specific challenges to be addressed in the final section.

Specific Legal Strategies to Bring about the Prohibition of Weapons in Space:

General Assembly Resolution

An individual nation, or group of nations may propose a resolution in the General Assembly. Once passed, the resolution declares the official policy of the United Nations. Although resolutions are not legally binding, they may serve as an effective political tactical tool to gain publicity and support. A General Assembly Resolution is also a means for any nation to place an item on the agenda of the Committee on Disarmament. However, the strongest legally binding way to bring about the prohibition of weapons in space would be in the form of a treaty. There are several channels available to accomplish this task.

Amending The Outer Space Treaty

The Outer Space Treaty provides a legal means for its amendment. Article XV states: "Any State party to the Treaty may propose amendments to this treaty. Amendments shall

enter into force for each State Party to the Treaty accepting the amendments upon their acceptance by a majority of the States Parties to the Treaty and thereafter for each remaining State Party to the Treaty on the date of acceptance by it." Acceptance requires declaration, signature and ratification within the legislature of the party.

Although the United States could propose an amendment in this forum, it has opposed the discussion of space military matters in UNCOPUOS, preferring instead the U.N. Conference on Disarmament

Legal Procedures for the Creation of a Treaty in the CD

At the beginning of the annual session or (by the request of the President of the Conference) in a special session, the Conference adopts its agenda for the year. Items appearing on the agenda take into account recommendations made by the General Assembly, proposals presented by member States of the Conference, and decisions of the Conference. Thus the United States, or another member of the CD, may propose a treaty for consideration at its discretion. Non-member states may also potentially place items on the agenda by organizing a successful General Assembly Resolution.

A consensus by the 66 member nations is required for the Conference to adopt a decision, and it is subject to ratification as in UNCOPUOS.

Potential Elements of a Proposed CD Treaty

TREATY ON PROHIBITING THE USE OF ALL WEAPONS IN OUTER SPACE

Proposed by the United States of America

May 15, 2002

The States Parties to this treaty,

Fully aware that outer space is fragile,

Bearing in mind the benefits obtained from the space infrastructure,

Recognizing that existing international instruments, including the 1967 Outer Space Treaty, have left open the possibility for conventional weapons in space,

Desiring to mitigate environmental damage, potentially rendering space unsuitable for use for hundreds of years in the event of a space-based war,

Considers all space-based weapons systems aggressive, including those intended for defensive purposes, and,

Have agreed on the following:

Article I

a) It is prohibited to launch weapons, including but not limited to weapons of mass destruction, or objects for the purposes of destroying, or otherwise rendering incapable, earth orbiting satellites operating within the norms of international law.

Article II

a) A defensive system shall be defined as a system that has no objective intent to attack, as established by the modes of operational testing and internationally declared conditions of use.

b) There are two types of defensive systems: i) Purely defensive, non-aggressive systems that do not necessarily impede an aggressor's ability to strike the system, but are sufficiently robust to the impact of the attack to survive. ii) Aggressive defensive systems that are capable of strike or counter-strike.

c) Aggressive defensive systems shall be prohibited from testing and deployment in outer space.

Article III

a) The use of satellites for peaceful purposes shall include all non-aggressive satellites, including satellites providing a national technical means for intelligence purposes.

Article IV

a) Any State Party to the treaty suffering the loss of a satellite (or object stationed in space) as a result of the intentional use of an aggressive system shall be entitled to compensation and reprisal provided that

b) The reprisal is proportionate to the damages incurred and

c) Does not involve the destruction of an operational satellite

Barriers and Strategies for Surmounting them

If the United States were to take the lead role in pursuing a multilateral treaty banning space-based weapons, there would likely be little political resistance from the

international community. However, internal resistance is likely to be substantial as indicated by the Rumsfeld report. Due to this internal resistance, and the time necessary to promulgate the treaty, the United States may run the risk of promoting a treaty the Congress would not ratify. To prevent this, strong political coalition building within the Congress will be necessary. To gain the support needed, the President would likely have to make the treaty a top priority, and time the legislation such that the ratification falls within the time period before the next Congressional electoral cycle. Substantial international diplomacy to pressure the timely ratification of the treaty by other nations would also be necessary.

The efficacy of multilateral global agreements is limited. The U.N. can only control its members to the extent they allow themselves to be controlled. However, as the U.S. is the most heavily invested nation in space, and has strong economic, military, and political capabilities, it would be in its interest to ensure the full compliance through its reconnaissance satellites and other intelligence gathering capabilities.

Cost-Benefit analysis is the preferred basis for U.S. policy decisions. Unfortunately, the potential costs and benefits of the purely defensive versus space-based defense are largely indeterminate. It is also difficult to weigh the costs and benefits of the two systems qualitatively due to the uncertain effects of each system. For example, how does the cost of possible global destabilization, compare with the possible cost of a less capable NMD system? If such distinctions cannot be made, President Bush and other leaders may see no need to consider a purely defensive system.

Additionally, if the space posture set forth in the Rumsfeld report is indeed the national policy, and the U.S. feels that it has no responsibility outside its national borders, it will not be possible to prevent the weaponization of space even if the U.S. is found to be in violation of the Outer Space Treaty, since withdrawal from the Treaty is permitted under Article XVI.

In this case, other nations may attempt to force (through the U.N.) the United States to internalize the costs of testing and operating weapons in space. Perhaps this may lead to the development of space debris mitigation technologies to ensure that the space environment remains a viable place for satellite operation.

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