

USAWC STRATEGY RESEARCH PROJECT

**UNITED STATES SPACE POLICY- A POLICY WE GOT RIGHT....
SO FAR**

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This SRP is submitted in partial fulfillment of the requirements of the Master of Strategic Studies Degree. The U.S. Army War College is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, 3624 Market Street, Philadelphia, PA 19104, (215) 662-5606. The Commission on Higher Education is an institutional accrediting agency recognized by the U.S. Secretary of Education and the Council for Higher Education Accreditation.

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Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 15 MAR 2006		2. REPORT TYPE		3. DATES COVERED	
4. TITLE AND SUBTITLE United States Space Policy A Policy We Got Right...So Far				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) David Hagg				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army War College, Carlisle Barracks, Carlisle, PA, 17013-5050				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited.					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT See attached.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 18	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

ABSTRACT

AUTHOR: Colonel David Hagg
TITLE: United States Space Policy- A Policy We Got Right...So Far
FORMAT: Strategy Research Project
DATE: 26 March 2006 WORD COUNT: 4850 PAGES: 17
KEY TERMS: None
CLASSIFICATION: Unclassified

Since the race to place a man on the moon was won, the United States has enjoyed a dominant advantage in space, both economically and militarily. From that time, practically every administration pursued policies and programs, which ensured dominance of space. This was possible because only the wealthiest countries could afford space technologies and access. Now, even commercial companies (both foreign and U. S. owned) have access to space capabilities. The United States government has used a "right time" approach toward space policy. This paper explores how the U. S. has used policy to maintain the lead both economically and militarily in space.

UNITED STATES SPACE POLICY- A POLICY WE GOT RIGHT.....SO FAR

Since the race to place a man on the moon was won, the United States has enjoyed a dominant advantage in space, both economically and militarily. From that time, practically every administration pursued policies and programs, which ensured dominance of space. This was possible because only the wealthiest countries could afford space technologies and access. Now, even commercial companies (both foreign and U. S. owned) have access to space capabilities. Spot Image of France, Mitsubishi of Japan, and India intend to sell space imagery products on the open market that place capabilities that rival the United States' best into the hands of anyone with a wallet. ¹

United States Space Command postulated in early 1998, that the nation had developed a dependence on space capabilities that rivaled our dependence on oil or electricity. ² So heightened is our dependence, that President Clinton designated Space as a vital national interest in his National Security Strategy of 1999. ³ While space, as a vital national interest, was not included in the most recent National Security Strategy, President Bush ordered a comprehensive review of National Space Policy in June of 2002 that was to be delivered in October of 2004 (yet to be published). In preparation for the review, the Commission to Assess United States National Security Space Management and Organization received a seventy one-page report that outlined the vulnerability of the United States economy and military in the areas of satellite communications, remote sensing, weather and location, navigation, and timing. The report establishes that attacks to key space assets could cripple the US banking, shipping, aviation, and communication industries. ⁴

The United States military has transformed in ways that make space dominance essential to the conduct of operations. Information superiority provided by space-based intelligence and communications assets allows commanders information dominance over adversaries. Global positioning systems allow for precision strike capabilities in difficult access areas, as well as visibility on blue forces. Space-based broadband assets provide logistics and medical capabilities. While our military access to space is essential, military commanders voice concern that allowing our adversaries access to state owned or commercially produced space-based products could wipe away the information advantage we have learned to rely on. Some critics wonder whether the famous "left hook" would be possible if Saddam Hussein could buy imagery on the commercial market. ⁵ Information superiority, a hinge pin of United States military strategy, like facets of the United States economy, could be crippled by attacks to key space-based assets.

Background

Until recently, two international treaties applied to United States Space Policy. The Outer Space Treaty of 1967 sets aside the use of space for peaceful purposes. It seems obvious that the United States considers “peaceful” to mean non-weaponized. The United States has used space-based intelligence, surveillance and reconnaissance, communications, and location assets for decades in the prosecution of military goals. The treaty also prohibits placing any nuclear or other weapon of mass destruction (WMD) in orbit or to station any such weapon in outer space. The treaty does not explicitly ban other weapons in space used for the purposes of self-defense. Additionally the treaty, while not banning non-WMD weapons, in space makes any party liable for damage to another state caused by objects launched to or from space. This provision makes no distinction between intentional or accidental damage. Defense of a party’s space assets is not prohibited, but establishing the self-defense imperative could be necessary and difficult.⁶

The United States withdrew from the Anti-Ballistic Missile Treaty of 1972 in December of 2001 to pursue an antiballistic missile defense capability. In response to emerging rogue nation and terrorist threats to acquire missile and weapons of mass destruction technology, and on the heels of the September 11 attacks, President Bush sent notice of withdrawal from the Treaty. He also signaled intent to develop and deploy a layered missile defense system that would violate the treaty. The treaty also explicitly outlaws space-based anti-missile systems.⁷

Despite what may or may not be allowed by Treaty, the international community, largely, views weapons in spaces as a threat to international stability. Jean Jacques Dardain, head of the European Space Agency said, “For the U. S. space is an instrument of domination- information and leadership. Europe is purposing a different model- Space as public good.”⁸ In 2002 China and Russia, during the International Conference on Disarmament introduced a paper that proposed making any weapons in space illegal.⁹ A review of 50 pages of a google search on weapons in space found a wide-range of government think tanks, religious groups, media and industry experts opining on the danger of weapons in space. Only 1% of reviewed articles were in favor of the U. S. fielding such weapons.

Current United States Space Policy as enumerated in the National Space Policy, written in 1996 is to maintain United States’ technology advantage in space, assure access to space capabilities, and to counter, if necessary, space systems and services used for hostile purposes.¹⁰ The Quadrennial Defense Review (QDR) of 2001, while not a policy document, signaled further intention to maintain U. S, advantage in space by establishing that U. S. government and U. S. commercial space assets are vital security interests of the United States.

The U. S. will pursue activities necessary to assure U. S. freedom of action in space and, when directed, deny such activities to adversaries.¹¹

The most recent Quadrennial Defense Review, just published in February of 2006, gives clear intention to stay “at least one technology generation ahead of any foreign or commercial space power.”¹² The 2006 QDR, for the first time in a public document, recognized China’s attempts to develop counter-space capabilities to negate or reduce the United States competitive advantage in space.¹³ While the QDR did identify the Chinese threat; the QDR was curiously less provocative than the previous QDR concerning how to handle threats to United States space assets. As already highlighted, the 2001 QDR blatantly established U. S. intent to assure freedom of action, and if required, to deny access of space capabilities to adversaries. The February 2006 document treats the subject more obliquely by establishing the U. S. will maintain access to space capabilities “unfettered, reliable and secure”.¹⁴ But, will do so by “improving space situational awareness, protection and through other space control measures.” Space doctrine writers will argue that “other space control measures” refers to pursuing activities to be able to deny space capabilities to adversaries. While that argument is probably true, this year’s statement is certainly less provocative.

Another key component of U. S. space policy is enhancing the economic competitiveness and scientific and technical capabilities of the United States. If United States’ interest in space were only military, space policy would severely restrict United States companies from selling space capabilities. However, United States space policy has recognized the need to not only be the world’s foremost military power in space, but to be world economic leader in space, as well. Space-based capabilities such as launch, communications, and sensing all began with very restrictive policy and military purposes. As foreign companies and nations entered the space marketplace the government of the United States has changed policy to ensure the economic lead in space remains America’s. The need to remain in front economically is so important that in the middle of two wars, President Bush push aside long time governmental fears of products being available to adversaries via open market sources. Those fears drove policy to restrict remote sensing resolutions above what foreign companies could provide. The Bush administration recognized that such policies were causing U. S. industry to begin losing its competitive advantage. President Bush revised remote sensing policy to a half-meter resolution, which is better than any foreign company offers. He also directed the U. S. government to buy imagery products from U. S. industry to foster investment and reduce requirement on military and national imagery assets.¹⁵

The current situation places the United States in complex circumstances regarding space. We must have assured access to our commercial, civil, and military space-based capabilities. We must have the ability to deny the enemy access to space-based capabilities. We must allow our industry to compete in the world market by developing technologies usually reserved for national security purposes. And, we must do all these things in an environment where weapons in space for any purpose, is akin to the development of weapons of mass destruction.

Analysis

The United States government has used a “right time” approach toward space policy. The United States has two interests of primary importance in space: security and economic well-being. The objective or ends toward those interests has been to maintain U. S. dominance in space, both militarily and economically. U. S. policy regarding the global positioning system (GPS), remote sensing, and weapons in space underscore the “right time” approach (ways). Both GPS and remote sensing were developed with national (military) purposes in mind, but policy and application were changed incrementally (at the right time) to allow civil and commercial investment and exploitation. U. S. policy on space control is following a similar pattern. The most recent QDR establishes the United States will proceed with relation to space control in a way which will ensure our security while exploiting the economic benefits of our national investment in space.

DoD fielded the global positioning system of satellites with very limited access to non-DoD users. The U. S. Department of Transportation received access on a subscription basis a few years after fielding. Then, the Department of State negotiated agreements among other states for GPS access rights. In 1984, DoD made the signal available to the open market, but restricted signal quality in order to make non-U. S. military use difficult. In 2000, DoD made 10-meter location accuracy signal available to all users.¹⁶ Just as recent as December 2004, President Bush’s new Space-based Navigation, Positioning and Timing Policy recognized emerging foreign competitors to GPS and further opened access to United States technologies to encourage foreign investment and ties to GPS rather than to allow the development of a competing system. The policy establishes permissive language concerning the sale of capabilities that are currently, or planned, to be available.¹⁷ Encouraging foreign interests to buy GPS capabilities generates licensing revenue for everything from planes, to automobiles, to cell phones. Since United States companies remain in the lead with regard to emerging GPS technologies, foreign companies often find buying U. S. products preferable to developing their own. The GPS policy also continues United States commitment to not use a system known as

Selective Availability to degrade GPS globally. Such a commitment furthers U. S. goals to encourage foreign use of GPS.¹⁸ By not using Selective Availability, United States policy makers increase foreign confidence in GPS and global dependence on the system.

The new GPS policy also establishes the basis for maintaining our military advantage with regard to navigation, positioning, and timing. The policy directs the Department of Defense to “deny adversaries position, navigation, and timing services from the Global Positioning System without disrupting civil, commercial outside an area of military operations and for purposes of homeland security.” Additionally, DoD is tasked with keeping track of who is pursuing GPS technology for military related purposes.¹⁹ Adversaries have a tough choice to make regarding the use of GPS for precision targeting. Spend billions on their own navigation system or use GPS and risk losing the capability at the exact time they wish to use it. Imagine a missile launched from Iran with an intended target of the United States. The missile, using GPS guidance, heads for its intended target. Then, the missile in mid-flight is manipulated to land where it was launched. Such are the choices of United States’ adversaries. Military advantage will be maintained by keeping secret the technologies necessary to tell who is using GPS signals and how those signals might be manipulated.

As discussed previously, U. S. policy-makers used Selective Availability as the way to maintain military advantage for nearly a decade. As the market place became dependent on GPS-like technology and the need for more accuracy started to rise, the United States began offering more accurate signals while also pursuing new ways to protect our military advantage. This “right time” strategy has effectively balanced and military advantage and economic prosperity. The U. S. maintains military advantage while the United States economy benefits by controlling over 33% of the global market share of positioning, navigation, and timing technologies.²⁰ Competitors like the European Union, China and Japan have to balance the billions of dollars to develop and launch their own system against the costs of using United States provided services. Despite the U. S. tremendous economic advantage, and fears that the U. S. would deny the signal during a crisis, no one has mounted a competitor past the planning stage.

The U. S. policy toward remote sensing further illustrates how policy makers promote security and economic aims by “right timing” policy decisions. Like GPS, remote sensing began as a military designed and used industry. The U. S. controls the technology lead in ability to provide accurate space-based imagery. Policy makers have changed policy, as required to allow U. S. companies to maintain the lead in ability to provide the most accurate imagery available to the global market place. Now, Space Imaging, a U. S. company, is licensed to

provide 1-meter resolution imagery, better than the best any competitor can offer. President Bush has furthered commercial advantage in space by establishing that the United States government will buy imagery from U. S. companies for all, but the most sensitive purposes. This was a 35 million dollar purchase in Fiscal Year 2001 alone.²¹

While few competitors have emerged to GPS, many exist in the area of remote sensing. France, Japan, India, Israel and Russia all have remote sensing capabilities, as does commercial companies such as Spot Image. While locating systems like GPS require large satellite constellations, remote sensing can be done by much smaller satellites. The smaller, lighter, and fewer satellites can be placed in space much cheaper, thereby opening the market to more players since launching items into space is the most expensive part of the space equation. The U. S. has responded by "right timing" the means applied toward technologies that offer significant advantage over any sensing currently available. While budgets on these technologies are not available via open sources, the United States Space Long Range Plan highlights the characteristics and development of hyperspectral, ultraspectral and advanced electro optical systems. These systems coupled with advanced computing could make identification of targets immediate.²² Development of these systems would allow the U. S. to stay ahead of adversaries in both technology and information superiority establishing, again, the link with security and economic well-being.

Foreign competitors and nation states face the same challenges in the area of remote sensing as they do with GPS. As discussed, many have entered the market with first or second generation systems. However, these systems are capable of providing less resolution, coverage and revisit rates than U. S. systems. Competitors could launch new systems capable of better performance and still find themselves behind what could be bought on the open market from U. S. companies.

U. S. military strategists worry that policies that allow U. S. companies to sell remote sensing technologies are eroding our informational advantage over our adversaries. Such worries stem from a simplistic view of remote sensing policy. The United States Army War College uses an article produced by the Center for Strategic and International Studies (CSIS) for its' only lesson on space. The article highlights that the United States has no peer in remote sensing, but at the same time postulates that our military advantage is less than it was before foreign countries could buy imagery on the open market.²³ Such a statement is not fact, though it is stated as one. While it is true that potential adversaries do have access to imagery of military utility for the first time, it is quite possible, and most likely, that the United States military advantage in remote sensing is the largest it has ever been. While adversaries are struggling

with slant angles, revisit rates, available band-width, and 10 meter resolution, the United States has moved on to full motion video, GPS cross-matching and real-time relay. The result, adversaries have a remote sensing capability of marginal utility while the United States has the capability to convert remote sensing data to targets in near real time. The same CSIS study argues for a new approach with regard to remote sensing policy.

The article states, "Remote sensing satellites pose a greater risk to U. S. security than other satellite services, but we need to be careful in differentiating the risk. Access to remote sensing capabilities provides extensive military advantage to those who did not have access before. Once countries obtain this basic level of access, however, it requires substantial improvements in revisit time and resolution to gain further military advantage. The United States no longer has the ability to prevent the spread of basic remote sensing capabilities and it needs a new approach to manage the risks created by commercial remote sensing services. The challenge is how to maximize the United States can best interact with the commercial space imagery market to benefit national security. As countries seek to improve their remote sensing capabilities, however, the United States still has unique technologies that provide resolution and targeting capabilities beyond what is available from foreign sources or in the commercial market. Foreign sources are unlikely to develop similar technologies in the near future. The United States should not share these technologies with foreign imagery satellite programs."²⁴

This position of CSIS shows a lack of understanding of United States policy regarding remote sensing. The United States space policy makers recognized, years ago, that the United States no longer had the ability to halt the spread of basic remote sensing capabilities. They also recognized the challenges of interacting with commercial space imagery providers in ways that benefit national security. This is exactly the reason remote sensing policy has changed to allow U. S. companies to sell 1 meter imagery, and to, as a matter of policy, have the United States Government buy all of our imagery from those same U. S. companies. Such a policy ensures U. S. companies remain the world's leader in space imagery while also controlling the military utility of such imagery. Policy makers control the military utility by establishing laws concerning revisit rates and slant angles. As CSIS correctly noted, the United States has unique technologies that provide resolutions and targeting capabilities beyond any competitor. This is another blinding flash of the obvious of why policy makers now allow 1 meter resolution imagery to be sold. It's because U. S. capabilities are significantly better and because we can reap economic benefit from selling the imagery. Suggesting the United States should not share the unique technologies and capabilities with foreign satellite program further shows CSIS does not understand U. S. space policy. Policy makers will allow those technologies to be sold when the United States has developed something that is significantly better, and at a time to preclude a competitor from emerging.

U. S. policy on weapons in space, like GPS, and remote sensing, employs the “right time” strategy. Detractors on U. S. space policy point to our stated policy of assuring access to space capabilities while being able to deny access to others as an overt statement of intent to weaponize space. Such detractors apply a one-dimensional view of U. S. space policy. The United States has possessed the capability to weaponize space for at least 20 years. While rudimentary, the space shuttle can be used to fly in proximity to threat satellites and destroy or disrupt enemy capabilities in a variety of ways. Such detractors also neglect the possibility that the United States could deny access to space capabilities by destroying ground stations or by jamming satellite up or down links.

The Quadrennial Defense Review of 2001 contained a more likely scenario for U. S. space policy. The QDR showed the U. S. will continue its way of “right timing” space policy. The QDR established the objective of ensuring U. S. freedom of action in space. The document even enumerated the possibility of denying freedom of action to adversaries. But the QDR says, “As a foundation of space control, space surveillance will receive increased emphasis. DoD will pursue modernization of the space surveillance infrastructure, enhance the command and control structure and evolve the system to a system that provides space situational awareness.”²⁵ This statement is one of a very few statements in the QDR that set a priority for the application of means concerning space.

Placing emphasis on space surveillance recognizes the vulnerability of our space assets and sets the conditions for an enforceable policy of deterrence regarding U. S. space assets. In 1998, United States Space Command (USSPACECOM) released in open sources, the fact that the command could not locate, track or positively identify the origin of threats to space assets.²⁶ Possessing the capability to identify the perpetrators of an attack on U. S. space assets would allow the U. S. to establish a policy similar to that of a ballistic missile attack on the U. S.. This is not to suggest the attack would be met with a nuclear response. However, a policy which stated, “The United States will view any attack on a U. S. space asset as an attack on the sovereignty of the United States”, would be enforceable. The USSPACECOM Long Range Plan established that such a surveillance system was possible by 2007.²⁷ The February 2006 QDR reaffirmed U. S. commitment to a space surveillance system.²⁸ A deterrence policy regarding space attacks is inherently defensive in nature and is acceptable to the global community. This reaffirmation of commitment to improving a space surveillance system is also further proof the United States will continue to “right time” space policy.

This “right time” policy does not predict that the United States would never weaponize space. Many have suggested space power closely resembles the evolution of air power. “Air

Power evolved from reconnaissance, to transportation, to communications, to air combat, and finally, strategically projecting power on battlefield.”²⁹ Such theorists view weapons in space as inevitable. U. S. space policy does not discount that possibility. The U. S. has invested in technologies that offer the possibility of offensive or defensive weapons in space. However, the U. S. has been careful to develop those technologies under the auspices of self-defense. For example, the national missile defense system has been criticized for having a space boost phase, interceptor (exo-atmospheric kill vehicle-EKV) that could also have anti-satellite application.²⁹ While many of the same technologies might be required for an anti-satellite system, the missile defense system does not weaponize space. The United States would only launch the EKV when under attack. The fact that an intercept of a nuclear weapon occurred in space would only serve to prove the need for such a weapon.

Options

There are two major points of view that criticize of U. S. Space Policy. The “space is a place for peaceful pursuits” point of view voiced by Jacques Dardain, the head of the European Space Agency, and Theresa Hitchens propose an arms control agreement much like the nuclear proliferations agreement, that would bar weapons in space. They argue that an arms control agreement is the best option, not only for the United States, but the rest of the world, as well. The current situation with rogue states, like Iran and North Korea, suggest an arms control agreement might not work. For any agreement on weapons in space to be successful, intelligence would have to be good enough to prove a state had a space weapons program. Then, once it were proven that a space weapons program existed, the United Nations would have to act. The United Nations finds itself in that exact situation regarding nuclear proliferation with rogue states now, and has yet to prove they will act to deal with the threat. By placing emphasis on space surveillance capabilities, the United States is establishing a condition for a possible deterrence policy and allowing for the possibility that arms control might work.

The other point of view is voiced by many military strategists and enumerated by United States Space Command is based on U. S. dependence on space. This view points to U. S. vulnerability in space and postulates that an adversary could severely cripple our economy and erode the information superiority our military force counts on. Weapons in space are inevitable they argue. Space power, they say, will evolve much the way air power did in the 20th century.³⁰ Current U. S. space policy does not neglect this possibility. In fact, the current QDR speaks of pursuing technologies that enable “other space control measures”.³¹ People familiar with space doctrinal terms recognize that space control measures could include assets necessary to deny

the use of space to adversaries. Those assets could include options that do not weaponize space such as direct action against ground stations or ground based jamming but, the options could also include space based kinetic attack assets.

However, a U. S. policy that advocated weapons in space, before the “right time” would have the net effect of dropping a hand grenade from an airplane. The effect on the ground would be little, but the world community would band together to counter the threat. While it is in the best interest of the U. S. to maintain the advantage in space, a space weapons race is not necessary as long as a competitor does not emerge to threaten U. S. economic or military interests. Current policy allows the U. S. to maintain its lead in space without spending levels that would threaten other U. S. priorities. To fight space warfare, the U. S. would have to increase spending in a variety of protection and survivability technologies to make our most critical satellites less vulnerable. The U. S. is investing in those capabilities at a sustainable rate that does not threaten the world community to the point that galvanizes them to take action against us.

U. S. policy with regard to weapons in space has effectively continued the right time philosophy. Policy makers have positioned the U. S. to handle threats to our assets in space without eliciting a response from the world community. Detractors resent U. S. stated objectives of maintaining its lead in space and to, if necessary, deny those capabilities to adversaries. The detractors, at the same time, must admit that the world has benefited greatly from U. S. provided space capabilities at relatively low costs. Because the world is now dependent on United States space technologies and assets, the U. S. is able to effectively argue pursuit of space control technologies is prudent to ensure rogue actors can not cripple the world transportation, communications or economic systems. Therefore, the entire world, not just the U. S. benefits from United States’ efforts to protect space capabilities.

Recommendations

The United States can be criticized in many areas of policy. Certainly our inability to break our dependence on foreign oil makes energy policy a lucrative target for criticism. Our export/import imbalance with China challenges our trade policy with that country. The Bush administration’s inability to handle Iran’s development of nuclear weapons, the Iraq war, and the emergence of Hamas as a political party in Syria, all place U. S. foreign policy in the cross hairs of pundits. However, United States administrations since at least President Reagan have used well-crafted space policy to maintain security while ensuring economic advantage in space.

Effective space policy has allowed the U. S. to remain well ahead of any adversary without starting an arms race. Space policy makers need little advice on how to proceed.

However, the U. S. must be careful with policy rhetoric. Phrases like “space dominance” and “deny the use of space to adversaries” threaten our allies and adversaries. Policy makers should note, where and when possible, that denying access could occur through means like jamming and attacking control stations. Policy makers should continue to highlight that we are investing in a space surveillance system that will benefit all nations by reducing the possibility of accidental collisions, and by establishing accountability for a state's actions in space. They should also note that only the United States has taken the necessary steps to make peace in space possible. The U. S. should continue investment in “dual use” technologies like the EKV that are defensive in nature, but allow the development of offensive capability if a near competitor appears. The U. S. should also continue the current pace of protection and survivability development. Attacks on certain critical systems could have a devastating effect on national security. A survivable space infrastructure makes an attack fruitless. Collision avoidance, hardening, and redundancy technologies will enable the United States to survive attacks without overwhelming effects. The “right time” approach to space policy has established U. S. preeminence in space both economically and militarily and has set the conditions for this to continue for many years.

Endnotes

¹Linda L. Haller and Melvin S. Sakazaki, “Commercial Space and United States National Security, a report for the Commission to Assess United States National Security Space Management and Organization”, available from; <<http://www.fas.org/spp/eprint/article06.html>> Internet; accessed 21 September 2004, 14.

²Howard Estes, United States Space Command, *United States Space Command Long Range Plan*, (Colorado Springs, CO: March 1998), Introduction.

³William J. Clinton, *A National Security Strategy for a New Century*, (Washington, D.C.: The White House, October 1998), 12.

⁴Haller, 9-10.

⁵Theresa Hitchens, “Disarmament Diplomacy,” October-November 2002; available from <<http://www.acronym.org.uk/dd/dd67/67op2.htm>>; Internet; accessed 21 September 2004. 2.

⁶Summary of United Nations, “Outer Space Treaty, Treaty on Principles Governing the Activities of States in the Explorations and Use of Outer Space, Including the Moon and Other Celestial Bodies”, 27 January 1967, available from <http://www.greaterearth.org/laws/outers_t.htm>, Internet; accessed 29 September 2004.

⁷George W. Bush, "Announcement of Withdrawal from the ABM Treaty," 12 December 2001, available from <<http://www.whitehouse.gov/news/release/2001/12/20011213-2.html>>, Internet; accessed 29 September 2004.

⁸Marc Lanella, "Shooting Stars, U. S. Takes First Step Toward Weapons in Space, 30 March 2004. available from <http://abcnews.go.com/sections/scitech/us/space_weapons_040330-3.html>, Internet; accessed 29 September 2004.

⁹Hitchens. 3.

¹⁰National Space Policy, available from <<http://www.ostp.gov/ntsc/html/cs/fs-5.html>>; Internet; accessed 29 September 2004, appendix F-2, 3.

¹¹Department of Defense, *Quadrennial Defense Review Report*, (Washington D. C., Pentagon, 30 September 2001), 45.

¹²Department of Defense, *Quadrennial Defense Review Report*, (Washington, D.C. Pentagon, 6 February 2006), 55-56.

¹³*Ibid*, 29-30.

¹⁴*Ibid*, 56.

¹⁵Summary of Remote Sensing Report, Haller, 11-16.

¹⁶*Ibid*, 16-19.

¹⁷U. S Space Based Positioning, Navigation and Timing Policy, available from <http://asmara.usembassy.gov/eritrea/img/assets/5816/factsheet-timingpolicy.pdf>, Internet accessed; 23 March 2006. 2-4.

¹⁸*Ibid*, 9.

¹⁹*Ibid*, 7.

²⁰Haller,15.

²¹Summary of commercial applications, Haller,14.

²²Estes, 55.

²³Technology and Public Policy, Center for Strategic and International Studies in Implementing National Military Strategy, U. S. Army War College Selected Readings, Volume 2, (USAWC, Carlisle, PA:12 February 2006), 26-49.

²⁴*Ibid*.

²⁵Department of Defense, *Quadrennial Defense Review Report*, (Washington D. C., Pentagon, 30 September 2001), 45

²⁶Estes, 30.

²⁷Ibid.

²⁸Department of Defense, *Quadrennial Defense Review Report*, (Washington D. C., Pentagon, 6 February 2006), 56.

²⁹Estes, Introduction.

³⁰Ibid.

³¹Department of Defense, *Quadrennial Defense Review Report*, (Washington D. C., Pentagon, 6 February 2006), 56.