## \*\*\*TOPICALITY\*\*\*

## 1NC Exploration = not in Orbit

### Space exploration excludes objects in Earth Orbit

Schmitt 3—Harrison Schmitt, Chairman Of Interlune-Intermars Initiative, Inc. and Apollo 17 Astronaut, November 6, 2003, Chicago Society for Space Studies, “Testimony on the Commercial Development of Lunar Resources” online: http://www.chicagospace.org/schmitttestimony.html

The term "space exploration" implies the exploration of the Moon, planets and asteroids, that is, "deep space," **in contrast to continuing human activities in Earth orbit.** Human activities in Earth orbit have less to do with exploration and more to do with international commitments, as in the case of the Space Station, and prestige and technological development, as in the case of China and Russia. There are also research opportunities, not fully recognized even after 40 years, that exploit the opportunities presented by being in Earth orbit.

### Votenegative*---*

### A) They explode the topic—our interpretation only allows for AFFs that explore outside the Earth’s orbit—they unlimit the topic to an infinite amount of AFFs that look back at earth

### B) Fair division of ground—They justify affs that do just about anything within Earth’s orbit—Means the neg can’t run specific case arguments because we can’t predict their aff. Human colonization is the core of the topic, so all other activities in space are neg CP ground.

## --SBL in LEO

### **SBL is in low earth orbit**

Park 6—Andrew Park, JD and MA from Colombia and University of Houston, “Incremental Steps for Achieving Space Security: The Need for a New Way of Thinking to Enhance the Legal Regime for Space”, Houston Journal of International Law, pg 15

The most prominent of the potential dual-use programs is **the Space Based Laser** (SBL), which **is designed to operate in** **Low Earth Orbit for the purpose of destroying “hostile ballistic missiles during their boost phase of flight.”**74 Military officials have discussed the potential usefulness of the SBL in enhancing U.S. force projection from space.75 In fact, these officials have gone so far as to suggest that “SBLs could form the replacement for the B-2A Spirit bomber, using directed energy to destroy ground based targets.”76 The Missile Defense Agency (MDA) is also in the process of developing a space-based defense option in the form of kinetic kill vehicles.77 Similar to the SBL, this particular system would seek to destroy enemy ballistic missiles during the boost phase. However, kinetic kill vehicles would accomplish this by the deployment of hundreds of small satellites around the earth rather than by one centralized laser.78 Needless to say, it is feasible to see how such a defensive space network could be modified to offensively threaten the space assets of other nations.79

## --Weapons in LEO

### Weapons are in low earth orbit

Heyman et al 5—David Heyman, Director of the Homeland Security Program at CSIS and former senior advisor at the White House and to the U.S. Secretary of Energy, 2005, “The Still Untrodden Heights: Global Imperatives for Space Exploration in the 21st Century” pg 38

One final governance-related challenge needs to be discussed in this chapter: the question of civil-military relations and the weaponization of space. It is a topic that is significant and complex, and this brief overview does not do it justice. Nevertheless, it needs to be mentioned in any comprehensive assessment of the future of human space exploration, because of the intersections between the two types of space activities. **The weaponization of space, mainly in low Earth orbit**, creates tangible risks to human space exploration, such as the possibility that conflicts in space could create debris fields that would make space exploration more dangerous. Even today, once in a while, both the ISS and the shuttle have had to avoid orbital debris. More importantly, space debris poses a threat to the broader sense of purpose within the space community, and an ethical challenge to the well- established idea of space as a domain of peace. Political leaders around the world must make decisions about their priorities for mankind’s utilization of space that take these concerns into account.

## 1NC Exploration = Human Presence

Exploration is sustainable human presence

Peter 8- Nicolas Peter, Research Fellow - European Space Policy Institute (ESPI), August 14, 2008, p. 32, ESPI, “SPACE EXPLORATION 2025: GLOBAL PERSPECTIVES AND OPTIONS FOR EUROPE,” http://www.espi.or.at

Using ESA definition from the document entitled “European Objectives and Interests in Space Exploration. ESA 2007”, space exploration is defined as to “extend access and a sustainable presence for humans in Earth- Moon-Mars space, including the Lagrangian Points and Near-Earth objects.” In the context of this study it encompasses therefore both robotic and human exploration activities.

**B) Reasons to Prefer**

**1. They explode the topic—Our interpretation limits the topic to affs that only expand to other planets. Their interpretation allows for us to send anything into space for an infinite amount of reasons.**

**2. Fair division of ground—They justify affs that do just about anything in space—Means the neg can’t run specific case arguments because we can’t predict their aff. Human colonization is the core of the topic, so all other activities in space are neg CP ground.**

## --Weapons = Satellites

### Space weapons include thousands of satellites with interceptors

Grego et al 4—Laura Grego is a PhD and expert on space and a scientist in the Global Security Program, Theresa Hitchens is leading U.S. analysts on U.S. military space policy, strategy and doctrine, Jeffery Lewis is a PhD and Director of the Nuclear Strategy and Nonproliferation Initiative at the New America Foundation, Johnathan Dean is a PhD and lecturer in political theory at the school of politics and international studies, October 21, 2004, “PROSPECTS FOR PEACE AND SECURITY IN OUTER SPACE” online: http://www.ngocdps.org/20041024

SECOND MILITARY MISSION: missile defense and denying space access to others. Neither missile defense nor denying access to space by other nations is a mission suited to space-basing. Ballistic missile defense is a mission that in principle benefits from space-basing since it allows global coverage. However, that advantage is more than offset by the practical difficulties of the system, especially its vulnerability to attack and high cost. I just mentioned the "absentee ratio," which is the number of satellites needed to ensure one is in a position to do the job it's intended for. For boost-phase missile defense, the defense only has a few minutes to detect the launch and destroy the missile. Such a demanding task would require many hundreds to thousands of satellites.

Also, there are inherent vulnerabilities to a space-based missile defense. To frustrate the defense, the targeted country just needs to be able to "punch a hole" in the system. A space-based missile defense consists of observable satellites with predictable coverage. An attacker can use a smaller and less valuable missile to attack the missile defense satellite and destroy it or get it to expend its interceptor; and then send its ICBM through the "hole". The defense will always be imperfect. If your reaction to this scenario is just to "Make sure there are two interceptors in place." I note that because of the motion of satellites, making sure there are two in place requires doubling the size of the entire constellation.

## --Brilliant Pebbles = Orbiting Platforms

### BP is made of platforms hosting light-weight interceptors

Weiss et al 4—Leonard Weiss is a senior science fellow at the Center for International and Security Cooperation at Stanford University and chair of the Federation of American Scientists, “Ensuring America's Space Security Report of the FAS Panel on Weapons in Space” p 39

An Excerpt from Space-based Missile Defense: Has its Time Comet12

Gregory Canavan is a well-known advocate of the space-based missile defense concept known as the Brilliant Pebbles, which consists of orbiting platforms hosting light-weight interceptors. The interceptors are designed to home-in on and collide with incoming ballistic missiles in the boost phase. Canavan was invited by the HAS to address the Panel, but declined the invitation. Henry Cooper, another well known advocate of space-based missile defenses, was scheduled to address the Panel, but could not do so due to a schedule conflict.

## 1NC Exploration Excludes Military

### Space exploration excludes military projects

Dart 7/13/11—Andrew Dart, broadcast engineer and space commentator, “Space Exploration News and Commentary” online: http://www.akdart.com/nasa2.html

These space exploration projects have very few tangible end products — certainly nothing that benefits the average taxpayer. The exploration of other planets (or any other space flight) is not authorized by the Constitution and is not the proper role of government. **The exception would be military projects in support of our national defense**, but the Pentagon has its own aerospace facilities.

### Vote negative

### A) They explode the topic—they justify a huge amount of military AFFs that makes being neg impossible—they are limited to exploring planets or space flight

### B) Fair division of ground—They justify affs that do just about anything that’s military—Means the neg can’t run specific case arguments because we can’t predict their aff. Exploration of planets is the core of the topic, so all other activities in space are neg CP ground.

## XT: Exploration not Military

### Exploration is peaceful—it excludes weaponization

David 5—Leonard David, Senior Space writer, June 17, 2005, “What should U.S. military do in space?” online: http://www.msnbc.msn.com/id/8258501/ns/technology\_and\_science-space/t/what-should-us-military-do-space/

"But we believe in the peaceful exploration of space," McClellan continued. "And there are treaties in place, and we continue to abide by those treaties. But there are issues that relate to our space program that could affect those space programs that we need to make sure are addressed."

As for the interagency review process of national space policy itself, McClellan added: "**It’s not looking at weaponizing space**, as some reports had previously suggested. But the peaceful exploration of space also includes the ability of nations to be able to protect their space systems."

### Space weaponization is distinct from Space exploration

Space Preservation Act of 2005—Full Text of H. R. 2420, 109th CONGRESS, 1st Session, online: http://www.space4peace.org/articles/space\_preservation\_2005.htm

A BILL To preserve the cooperative, peaceful uses of space for the benefit of all humankind by prohibiting the basing of weapons in space and the use of weapons to destroy or damage objects in space that are in orbit, and for other purposes. Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, SECTION 1. SHORT TITLE. This Act may be cited as the `Space Preservation Act of 2005'. SEC. 2. REAFFIRMATION OF POLICY ON THE PRESERVATION OF PEACE IN SPACE. Congress reaffirms the policy expressed in section 102(a) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2451(a)), stating that it `is the policy of the United States that activities in space should be devoted to peaceful purposes for the benefit of all mankind.'. SEC. 3. BAN ON BASING OF WEAPONS IN SPACE AND THE USE OF WEAPONS AGAINST OBJECTS IN SPACE IN ORBIT. The President shall- (1) implement a ban on space-based weapons of the United States and the use of weapons of the United States to destroy or damage objects in space that are in orbit; and (2) immediately order the termination of research and development, testing, manufacturing, production, and deployment of all space-based weapons of the United States. SEC. 4. INTERNATIONAL TREATY BANNING SPACE-BASED WEAPONS AND THE USE OF WEAPONS AGAINST OBJECTS IN SPACE IN ORBIT. The President shall direct the United States representatives to the United Nations and other international organizations to immediately work toward negotiating, adopting, and implementing an international treaty banning space-based weapons and the use of weapons to destroy or damage objects in space that are in orbit. SEC. 5. REPORT. The President shall submit to Congress not later than 90 days after the date of the enactment of this Act, and every 6 months thereafter, a report on- (1) the implementation of the ban on space-based weapons and the use of weapons to destroy or damage objects in space that are in orbit required by section 3; and (2) progress toward negotiating, adopting, and implementing the treaty described in section 4. SEC. 6. SPACE-BASED NONWEAPONS ACTIVITIES. **Nothing in this Act may be construed as prohibiting the use of funds for-** (1) **space exploration;** (2) space research and development; (3) testing, manufacturing, or production that is not related to space-based weapons or systems; or (4) civil, commercial, or defense activities (including communications, navigation, surveillance, reconnaissance, early warning, or remote sensing) that are not related to space-based weapons or systems. SEC. 7. DEFINITIONS. In this Act: (1) The term `space' means all space extending upward from an altitude greater than 110 kilometers above the surface of the earth and any celestial body in such space. (2) The terms `space-based weapon' and `space-based system' mean a device capable of damaging or destroying an object or person (whether in outer space, in the atmosphere, or on Earth) by- (A) firing one or more projectiles to collide with that object or person; (B) detonating one or more explosive devices in close proximity to that object or person; or (C) any other undeveloped means.

## Space Weapon Definition

### **Space weapons are any system that destroys or damages objects in space**

Slomczynska No Date-- Irma Slomczynska is a PhD in European Security Studies at Marie Curie-Sklodowska University, “Persisting Threats for Security – New Space Tools for the Global EU” pg 17

Thirdly, analyzing the European space assets we should be fully aware that there is a crucial distinction between “militarization” and “weaponisation” of space. Space has been “militarized” since the earliest communications satellites were launched into orbit. In contemporary strategic environment, mostly advanced technically armed forces rely heavily on satellites for command and control, communications, reconnaissance and monitoring, early warning, treaty verification, and navigation with the GPS. It means that space is militarized, but it is not yet weaponised. Space “weaponisation” is understood as the placement in orbit of space-based devices that have a destructive capacity. Space weapon is defined as “any system whose use destroys or damages objects in or from space.” 65

INSERT FOOTNOTE

65 J. C. Moltz, The Politics of Space Security ..., p. 43. That definition of space weapon excludes: non-devoted, dual-use systems, which can disable or capture satellites; missiles passing through space without harming space assets; systems which interrupt the operation of satellites (like electronic jamming) – reversible effects; unintentional weapons – debris fragments, old spacecraft. It includes: ground-, sea-, space-based anti-ballistic missile; ASAT systems – laser, kinetic-kill vehicles, explosive systems used to destroy objects in space; any military systems used in space that have damaged spacecraft in the past – for example nuclear weapons tests in space.

END FOOTNOTE

Therefore, while satellites may be used for military purposes, such as GPS navigation of fighter jets or precision guided missile delivery, satellites themselves have no destructive capacity and their military supporting role is not considered weaponisation per se.

## Weapons Travel through Space

### Weapons travel through space

Space Security Index No Date—“Space Security Fact Sheet” online: www.spacesecurity.org/SpaceSecurityFactSheet.pdf

Space-based strike weapons can potentially target objects on Earth or traveling through space through the projection of mass or energy. No space-based strike weapons have yet been tested or deployed, but this is a fragile threshold whose preservation is uncertain. For instance, the US continues to develop a space-based interceptor for its missile defence system, and a growing number of actors are developing precursor technologies outside of dedicated weapons programs.

## \*\*\*ADV CP\*\*\*

## 1NC ADV Counterplan

### Text: The United States federal government should: outfit all its satellites with physical shields to prevent high-intensity laser light; increase Unmanned Aerial Vehicles in space and high-power pseudo-satellites on the ground; focus on capabilities to jam satellites uplinks or downlinks.

### Hardening satellites provide a better form of protection against ASATs

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

Only a constellation of space-based lasers could respond with necessary promptness and global reach; the ground-based hostile laser system, however, could be outfitted with protective measures without concern for weight (unlike orbiting satellites), affording at least enough protection for the system to disable a U.S. target satellite. A single enemy ground-based laser could destroy only satellites within its line of sight, and the time necessary for other satellites to move into view would allow the United States time to target the site with conventional weapons, if its precise location were known. Consequently, an adversary would need multiple ground-based lasers or significant ground-based laser mobility to destroy many U.S. space assets.

A potential solution to this problem would be satellite self-protection. Reconnaissance satellites and other vulnerable systems could be outfitted with physical shields to protect optics and sensitive electronics upon detection of high-intensity laser light. Detection of the low-power aiming phase of the ground-based lasers would give time for closing a shutter to eliminate the exquisite vulnerability of the satellite's focal plane. If deployed promptly, a thin metal shield (a parasol) could provide substantial protection against a megawatt-class laser. n28 The point is that **space weapons are not an effective response to this threat, while strictly defensive measures and terrestrial weapons and retaliation may be.**

### UAV’s are superior at mitigating BMD prolif and protecting satellites- our evidence is comparative

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

Even advanced space weapons could not defeat a Nodong pellet-cloud attack, given the timing of rocket ignition and pellet-cloud formation. After launch, a Nodong rocket fires for about 110 seconds. Because the rocket may be below the clouds for 30 seconds or more of its trajectory, the chances of detection, tracking, and interception by a space-based laser (whose beam would not penetrate cloud cover) would be reduced. Furthermore, Nodongs can easily be hardened against a laser attack, are cheap and plentiful compared to SBLs, and can choose to fire when SBLs are most distant.

On the other hand, Whipple Bumpers, a set of passive barriers deployed around a satellite in space, could reduce a satellite's particular vulnerability to Nodong intercept. Deploying bumpers only in front of the satellite would minimize the extra mass and the added system cost.

The cost and limited effectiveness of a weapon-based satellite defense must be weighed against those of alternative approaches. In particular, the use of redundant backup systems with equal or greater capabilities in a theater of conflict, while not providing physical protection, would reduce an adversary's motivation to attack (if it was known that such an attack would have no effect), and in any case would reduce the adverse effects. Although accepting the inherent physical vulnerabilities of expensive and vital U.S. satellites is undesirable politically, and Whipple Bumpers add cost and may limit flexibility, a defense by redundancy is preferable to a weapons-based solution with a known low probability of success.

For example, UAVs do, and could further, augment or substitute for U.S. satellite reconnaissance assets, achieving equivalent imaging resolution by scaling the size of optics. The limiting resolution of a 2-meter satellite mirror in 300-kilometer orbit could be replicated by a 20-centimeter mirror on a UAV at an altitude of 30 kilometers. For distant targets, say at 100 kilometers, a 50-centimeter-diameter mirror would allow the UAV to match a satellite's resolution. Using multiple UAVs would mitigate the drastically reduced field of regard resulting from operation at lower airborne altitudes; this approach is particularly effective in the important case in which adversary interests and hence U.S. resources are concentrated in a localized theater of operations. Stealthy UAVs may be required for survival against capable air defenses.

IN SUM: PROTECTING U.S. SATELLITES. Space weapons are generally not good at protecting satellites' capabilities. In those cases where space weapons might play a unique or contributing role -- in opposing microsatellite attack and hit-to-kill antisatellite weapons -- terrestrial or passive approaches match or exceed their utility. In the case of microsatellites and bodyguards, one might commit to deploying (in the spirit of Jonathan Swift) "smaller still to bite 'em." **In** such **an arms race, the vulnerability inherent in the cost of existing and future U.S. high-capability satellites** in low earth orbit **outweighs any competitive advantages of superior** **U.S. space resources** (e.g., in building advanced bodyguard microsatellites).

Cost, long development cycles, and vulnerability suggest that space weapons are not -- except perhaps in the most narrowly defined of circumstances -- a satellite defense of first resort. Instead, the United States should develop redundant, terrestrial back-up systems, thereby reducing its dependence on satellites while ensuring the capabilities those satellites provide in a localized theater of conflict. High-power pseudolites on the ground and on UAVs could provide GPS, remote sensing, communications, and other satellite signals in a theater of operations, eliminating most of the benefit to theater adversaries intent upon attacking U.S. satellites. An adversary state or terrorist might still attack a valuable satellite not for military benefit but to damage the reputation of the United States; the solution to this problem seems to lie in the promise of retaliation against a state actor or a state aiding terrorists in such an act.

### Space weapons increase the likelihood of retaliation—focusing on jamming capabilities is key

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IN SUM: COUNTERSPACE. Although the ability to deny adversaries the hostile use of space is critical for U.S. national security, the United States must be heedful of its unique vulnerability as the country with the most to lose in space. In addition to requiring careful management to mitigate the proliferation of space debris, deploying physically destructive antisatellite weapons risks subjecting the United States to a disproportionate tit-for-tat.

Instead, the United States should choose a counterspace strategy that maximizes the security of its own satellites -- one that relies on nondestructive techniques to minimize threats from competitors' space systems and exploits U.S. strengths in nondestructive technological innovation (e.g., in developing flexible negation techniques). For protecting U.S. military and civilian space systems, the United States should focus on collective security measures, the success of which will depend on deterring attacks through the promise of retaliation against ground and political (but not space) assets. For denying adversaries the hostile use of space, the United States should focus on capabilities to jam satellite uplinks or downlinks, measures to attack essential ground stations, and the development of negation techniques such as obscuring satellite lines of sight through screens in space. n43 It may also be possible to use eventual U.S. capabilities for boost-phase intercept to destroy some antisatellite weapon launchers in powered flight -- especially from small states of interest, such as North Korea.

## Solvency: Harden Satellites

### Only increasing security of satellites prevents vulnerability

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DENIAL AND DECEPTION, GROUND-STATION ATTACKS, AND HIGH-ALTITUDE NUCLEAR EXPLOSIONS. The development of space weapons would not significantly mitigate three of the generalized threats to U.S. space capabilities mentioned above: denial and deception, attacks on ground stations, and high-altitude nuclear explosions. To counter an adversary's denial and deception techniques, for example, the United States might seek to employ multiple, redundant satellite and unmanned aerial vehicle (UAV) sensing channels; avoid detection of its reconnaissance satellites; and improve analysis of currently available imagery. Evidently, orbiting weapons cannot prevent physical attack on satellite ground infrastructure; more effective counters are familiar security techniques such as physical surveillance, fences, guards, and back-up systems. A high-altitude nuclear explosion, and its resulting bands of persistent, damaging beta radiation, would require shielding (to reduce the radiation dose) and, in some cases, hardening (to increase tolerance of semiconductor circuitry to radiation) of satellites in potentially vulnerable orbits. Technological means to pro-actively depopulate the trapped electrons from the Van Allen belts -- such as the orbiting of lead or uranium foil to scatter and disperse the electrons into the atmosphere -- are possible but in their infancy.

## Solvency: UAVs

### Spaceplanes are less provocative and are sufficiently replace the function of weapons

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The Spaceplane and Common Aero Vehicles. To address future denied-access threats, U.S. military space doctrine includes proposals for a "spaceplane," a reusable, unmanned space vehicle providing responsive, launch-on-demand global force enhancement and projection. n63 The proposed spaceplane would be armed with a common aero vehicle, a (proposed) small, low-cost, precision-guided missile capable of delivering conventional munitions against an assortment of targets. The CAV would protect its munitions during hypersonic reentry and then dispense them with the same accuracy as if they had been dropped from an aircraft (but with the greater global reach of the orbital spaceplane and without need to obtain overflight permission, as the CAVs would reenter controlled airspace only over the target country). Furthermore, advocates claim that the "spaceplane" will be less internationally provocative because space power projection, like airpower, could be extended when required, and withdrawn when the crisis subsided.

As proposed, a CAV could operate against fixed or mobile targets identified by surveillance data from another platform or, for instance, by laser target designation. CAVs are advocated for use against hard and deeply buried land targets, naval bases and surface combatants, massed forces, mobile targets, air bases, and military and civilian infrastructure, to name a few examples. n64 Proponents emphasize the advantages of striking from space: global reach from the continental United States, the ability to hit a target anywhere in the world in less than ninety minutes, a means of bypassing denial-of-access air defenses, the lack of a costly "logistics tail," and eliminating risks to pilots or support staff.n65

## CP Net Benefit

### The Counterplan avoids the link—weapons in space are politically unpopular

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

IN SUM: GLOBAL FORCE PROJECTION. Global rapid and denied-access force projection is possible and will happen without the development of space weapons, through adaptations to existing systems. Except for the unique capability that might be contributed by space-based lasers for a small class of targets, terrestrial methods of force projection appear to be superior to space weapons systems, if they were to become a reality at some point in the future. Furthermore, **space weapons will be expensive, vulnerable to countermeasures, and politically inflammatory.** The question of whether to deploy space weapons, therefore, becomes a matter of marginal value added and opportunity costs. In the near term, **nonspace weapons** such as UAVs, cruise missiles, and ICBMs with conventional payloads will provide greater capability sooner and at lower cost.

## \*\*\*EU CP\*\*\*

## Solvency

### EU has the tech—it can do anything the US does

Preston and Baker 2 – Bob Preston is a European space analyst that has published numerous books on European space policy, John Baker is a Senior fellow and lecturer of US-EU space policy, RAND Corporation “Strategic Appraisal: United States Air and Space Power in the 21st Century” pg 161

The Western school of space activity, in contrast, is modeled on U.S. practice. Canada’s development of radar remote sensing puts it in this school. Europe has historically featured some national variations in capability and interests, with notable and distinct centers in France, Italy, Germany, and Great Britain. However, recent trends in European industrial consolidation and political unity suggest that viewing the continent’s space capability as a whole is more appropriate. In that light, **European space is technically capable of providing anything that the U**nited **S**tates **can provide**, despite generally lacking the degree of sophistication in understanding applications that greater U.S. experience and past investment supply. Consensus on use and commitment of adequate resources to approach U.S. capabilities is also lacking. Europe is, though, a natural and generally compatible partner for U.S. national security space. It is also the **most capable source of commercial competition** for the U.S. space industry and the likely inheritor of the marketplace should U.S. industry be isolated.

### The EU is experiencing RMA—it can weaponize space

CIPI Foundation 7—CIPI Foundation is a non-profit organization legally established as an independent private foundation in Brussels, Belgium, “Are There New Security Enclosures? Clarifying Security Concepts and Boundaries” November 2007, Paper n.1/07 pg 26

It is necessary to introduce a further level of analysis, the commercial (or private) non-state actors, and to assess their competitive/cooperative relations with state national interests. The defence industry is deeply rooted in Brussels’ decision-making circles. National and supranational initiatives for “developing a European defence policy have gone hand-in-hand with the efforts of the arms industry to promote its interests in Brussels”.

18 The “Revolution in military affairs” (RMA) – which can be defined as a fundamental transformation in military affairs that results from changes in weapon technology and equipment, operational concepts and military organizational methods – has had a deep impact on the transatlantic defence industry. “Technological and industrial trends are blurring the distinction between defence and other industries, such as electronics and information technology…This is bound to increase competition in some defence markets, and to broaden the opportunity for linkages and alliances between defence and non-defence companies.” 19

Coupled with the RMA, the continuing threat of reduced defence expenditures in Europe and the increasing global competition, defence companies have reacted with a number of strategic moves involving mergers and acquisitions within the EU and across the Atlantic. The four largest space industry actors in Europe (Alcatel Espace, Alenia Spazio, Astrium GmbH and Astrium Ltd), for example, consolidated into the joint venture dubbed Galileo industries (a civilian and military project as we said). Of course, a major risk for EU defence industry is that some European firms may find themselves caught up in US transnational ownership networks. Others may succeed in expanding their US presence and then migrating to the US market. 20 Others may be swept aside. This said, the European aerospace industry continues to consolidate and this process has resulted in significant industrial restructuring across European borders.

21 **The European experience follows a trend towards military industry consolidation** similar to that which occurred in the 1990s in the US. “The concentration process, which began in the US, leaving Boeing, for example, as the only US manufacturer of large civil aircraft, has since extended to Europe, reflecting the call from French, German and British leaders … for major industrial consolidation.” 22 It seems thus that the future of EU defence industry will be defined by an increasingly complex tapestry of national and supranational political initiatives and transnational firms and joint ventures. 23

Europe's space sector and policies have thus significantly shifted at the European level although national strategic concerns remain crucial in linking them to member states. The evolution of EU supranational initiatives in the security realm and the common market-driven dynamics – strengthened by the RMA – mean that space assets are assuming an unprecedented supra- and trans-national role in Europe. 4. Potential threats for Europe in Space Space can provide unparalleled resources for supporting Europe’s security. **The satellites may support security-enhancing applications**, including disaster management, research into climate change, agricultural planning, rescue, arms control, verification, conflict prevention and confidence-building measures, **or military applications such as** **location, tracking and** **weapons targeting**. Nevertheless, it is important to recognize that potential measures of space assets could turn outer space into a battlefield: such abuses would threaten European and global security. A report of the European Parliament on the “Weaponisation of Space: Creating new threats through bad policy”, states for example: “ [Space] Military threats may be deliberate, for example if an adversary sought to eliminate or disable European satellites or their data-links or deny access to space assets or data; or collateral, as a consequence of misguided defence policies and practices undertaken by the US, Russia, China, European or other governments, **such as weapons deployment and use in or from space**, attacks with anti-satellite weapons or a nuclear detonation generating a disabling electro-magnetic pulse.” 24 It is thus crucial to accurately define ‘acceptable’ and ‘unacceptable’ uses of space.

## \*\*\*GROUND CP\*\*\*

## 1NC Ground CP

### CP Text: The United States Federal Government should upgrade its ground based missile defense capabilities.

Ground based BMD would be able to over come current problems

Frederick 9 – Lt Col Lorinda A. Frederick, USAF, BA, Michigan State University; MBA, Regis University; Master of Military Operational Art and Science, Air Command and Staff College; Master of Airpower Art and Science, School of Advanced Air and Space Studies, 9/1/09, “Deterrence and Space-Based Missile Defense,” Air and Space Power Journal, Fall 2009

After the Cold War, deterring ballistic missile threats became more complicated due not only to the increasing numbers of nuclear-capable states but also to the rise of hostile rogue elements within a state as well as the proliferation of weapons of mass destruction (WMD), along with missile technology and expertise.6 According to joint doctrine, “the predominant threat is not from a competing superpower, but more likely from the deliberate launch of a ballistic missile from a ‘rogue state,’ failed state, or terrorist group.”7 Yet, the United States has difficulty tracking ballistic missiles due to the shortage of accurate and reliable intelligence**,** having “been surprised in the past by an opponent’s earlier-than-expected military technology, including the testing of the Soviet hydrogen bomb, the testing of missiles by Iraq and North Korea, and the acquisition of Chinese missiles by Saudi Arabia.”8 Consequently, the “proliferation of advanced technologies for missiles, guidance systems, and WMD warheads *has increased the potential missile threat to the homeland*” (emphasis in original).9 Today, the United States must attempt to deter both state and nonstate actors.Nonstate actors and rogue elements complicate deterrence for a number of reasons.10 First, rogue elements’ decision makers are harder to identify and locate**,** let alone deter, than their state counterparts. Without the ability to attribute the use of WMDs to a rogue-element actor, or even its state sponsor, the United States may have difficulty deterring an attack. Leaders of rogue elements and proliferators threaten US, regional, and global security interests because they defy international laws or norms of international behavior and use asymmetric means to attack law-abiding nations.Second, the fact that states operate more in the open allows the United States to gauge their perceptions, based on their actions: “The objective of deterrence is to convince potential adversaries that courses of action that threaten U.S. national interests will result in outcomes that are decisively worse than they could achieve through alternative courses of action.”11 Because rogue elements do not operate in the open, the United States cannot accurately gauge their perceptions of capability and will.Third, the United States cannot threaten to inflict substantial costs on rogue elements that have few high-value assets, minimal territorial claims, and small populations, compared to their state counterparts.12 An adversary’s hidden calculation of cost, benefits, and risks complicates the US approach to deterrence.Fourth, it may prove difficult to discern what is important to rogue elements. The United States could easily assume that they share its goals and values—but this is a dangerous assumption.Fifth, the United States has neither established nor exercised communication channels with rogue elements to the same extent that it has with state actors**.** Communication is a necessary component of deterrence strategy with regard to relaying the United States’ intent to respond to aggression. Even after receiving a clear message, rogue elements may not be deterred. BMD could help the United States deter aggression and respond should deterrence fail.BMD should primarily be considered a vital part of a deterrent strategy and secondarily an effective tool to protect against ballistic missile attacks. BMD is an integral part of deterrence because it makes escalation less likely. Confidence in BMD technology may allow US decision makers to accept an increased risk of attack and allow time for other instruments of power to defuse the situation. Adversaries must consider US defensive capabilities in relation to their offensive capabilities. Confident that inbound ballistic missiles will not reach the homeland, the United States could choose not to respond in kind to such provocation**.**Extending BMD to friendly states bolsters deterrence because it effectively conveys to potential aggressors the US commitment to defense. Extended deterrence can keep other states out of the conflict. For example, the United States provided Israel with theater missile defense (TMD) during Operations Desert Shield and Desert Storm to protect the Israelis and keep them out of the broader conflict. Extended deterrence may encourage allies to “forgo indigenous development or procurement of duplicative military capabilities, thereby enhancing US counterproliferation efforts.”13 BMD is more than just a defensive measure that the United States possesses to knock down threatening missiles. Decision makers should think of it as a vital part of deterrence to help restrain rogue elements and proliferators.

## \*\*\*AEGIS CP\*\*\*

## 1NC Aegis CP

### CP Text: The United States Federal Government should upgrade the Aegis Ballistic Missile Defense System to include the capability to intercept intercontinental ballistic missile

### The MDA is already upgrading the Aegis system, all it needs to include is the ability to intercept ICBMs

Goure 11 – Dr. Daniel Goure, Vice President of the Lexington Institute, 4-26-11, “Aegis Missile Defense Success Refutes Critics,” The Lexington Institute, http://www.lexingtoninstitute.org/aegis-missile-defense-success-refutes-critics?a=1&c=1171

Earlier this month, the U.S. Navy successfully tested its Aegis Ballistic Missile Defense System (BMDS) consisting of an upgraded radar coupled with the advanced Standard Missile (SM) 3 Block IA against a simulated ballistic missile threat. The new SM-3 Block IA is the first in a series of improved variants of the interceptor that will permit it to engage longer-range, faster flying ballistic missiles, including eventually intercontinental ballistic missiles (ICBMs). This test suggests that the planned program to pursue sequential or block improvements in the Aegis radar, associated battle management and fire control and the SM-3 can produce a capable, multi-layered, land and sea-based defense against ballistic missiles of varying ranges.

The Aegis BMDS and Standard Missile-3 rest at the core of the Obama Administration’s approach to a phased adaptive architecture (PAA). The plan for the PAA envisions deploying first sea-based and then land-based Aegis radar/battle managers along with ever-more capable SM-3s. In 2015, the first Aegis Ashore will be deployed along with the SM-3 Block IB. By 2020 the PAA intends to have the first ICBM-capable system in the field including a SM-3 Block II.

## Aegis CP Solvency

### Obama needs to pursue a more aggressive strategy for the Aegis system

Spring 11 – Baker Spring, F. M. Kirby Research Fellow in National Security Policy at The Heritage Foundation, 5-3-11, “Sixteen Steps to Comprehensive Missile Defense: What the FY 2012 Budget Should Fund” The Heritage Foundation, http://www.heritage.org/research/reports/2011/05/sixteen-steps-to-comprehensive-missile-defense-what-the-fy-2012-budget-should-fund

The Obama Administration’s missile defense program puts the Aegis missile defense system at the center of its Phased Adaptive Approach (PAA) to missile defense. Under the Administration’s proposed FY 2012 budget, the Aegis system would receive a total of $2.128 billion from two sources, $1.5 billion from its own budget line and $628 million from a PAA line.[19] The Administration has proposed buying 46 SM-3 interceptors in FY 2012.[20] Nevertheless, the Administration is not pursuing the development of the Aegis system aggressively enough in developing and ultimately deploying SM-3 interceptors capable of countering long-range missiles

### Aegis solves EMP

Spring 11 – Baker Spring, F. M. Kirby Research Fellow in National Security Policy at The Heritage Foundation, 5-3-11, “Sixteen Steps to Comprehensive Missile Defense: What the FY 2012 Budget Should Fund” The Heritage Foundation, http://www.heritage.org/research/reports/2011/05/sixteen-steps-to-comprehensive-missile-defense-what-the-fy-2012-budget-should-fund

As the Independent Working Group noted in a recent study, missile defense will play a critical role in protecting the U.S. against EMP attacks because ballistic missiles are the best delivery means for EMP warheads.[39] Upgrading the Aegis-based BMD system and establishing an East Coast test bed for missile defense would provide substantive capability to address the EMP threat, but this requires establishing clear mission requirements. Congress can ensure that the Department of Defense assigns these mission requirements appropriately.

## Net Benefit

### The Counterplan avoids the link—weapons in space are politically unpopular

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

IN SUM: GLOBAL FORCE PROJECTION. Global rapid and denied-access force projection is possible and will happen without the development of space weapons, through adaptations to existing systems. Except for the unique capability that might be contributed by space-based lasers for a small class of targets, terrestrial methods of force projection appear to be superior to space weapons systems, if they were to become a reality at some point in the future. Furthermore, **space weapons will be expensive, vulnerable to countermeasures, and politically inflammatory.** The question of whether to deploy space weapons, therefore, becomes a matter of marginal value added and opportunity costs. In the near term, **nonspace weapons** such as UAVs, cruise missiles, and ICBMs with conventional payloads will provide greater capability sooner and at lower cost.

## \*\*Space Weapons Bad\*\*

## Perception Link

### **Space weapons are perceived as a provocation—causes an arms race**

Graham 7—Richard Graham, Colonel US Army, Program Research Project “United States in Outer Space Security Assurance and Preservation” June 30, 2007, pg 8

Deployment of space weapons coupled with preemption and preventive war policies as outlined in the National Security Strategy Document (2002) **may provoke an offense-defense spiraling space arms race** or asymmetrical anti-satellite attacks from other nations in response to **perceived** security vulnerabilities. The U.S. can avoid this space “arms race”, protect its satellites and U.S. commerce by **keeping its national missile defenses limited** (focus on troubled regions where missiles threaten the U.S. homeland or its Allies) and by establishing “rules of the road” protocols for its activities in space. 31

## China Link

### US SMD is viewed as aggressive--- causes China to develop weapons

Zhang 11—Baohui Zhang, PhD and Associate Professor of Political Science and Director or the Center for Asia Pacific Studies at Lingnan University, “The Security Dilemma in the U.S.-China Military Space Relationship” Asian Survey Vol. 51, No. 2, March/April 2011 pg 314-315

Although many U.S. experts are correct in emphasizing the importance of space war in Chinas asymmetric strategy to counter U.S. conventional advantages, this article suggests that Chinas military space agenda is also driven by the security dilemma between the two countries. **China is pursuing military capabilities in space to counter perceived national security threats posed by the U.S. quest for space dominance and missile defense that could neutralize China's nuclear deterrence.**

In both cases, Chinese security experts believe that the U.S. seeks "absolute security" in order to maximize protection for the American population from external threats.- this means that China at least recognizes the defensive motivations behind the U.S. quest for space dominance and missile defense. However, with the chaotic nature of international relations, one country's efforts to maximize its security could degrade the security of others by changing the balance of power. Inevitably, the U.S. quest for "absolute security" evokes countermeasures from other countries. As Kenneth Waltz observes, when a great power seeks superiority, others will respond in kind, since "maintaining status quo is the minimum goal of any great power.""

According to Robert Jervis, "The heart of the security dilemma argument is that an increase in one state's security can make others less secure, not because of misperceptions or imagined hostility, but because of the anarchic context of international relations." In this context, "Even if they can be certain that the current intentions of other states are benign, **they can neither neglect the possibility that the others will become aggressive in the future nor credibly guarantee that they themselves will remain peaceful.**"" Inevitably, when one state seeks to expand its military capability, others have to take similar measures.

### China is fearing US weaponization--- the plan would force China to develop too weaponize too

Zhang 11—Baohui Zhang, PhD and Associate Professor of Political Science and Director or the Center for Asia Pacific Studies at Lingnan University, “The Security Dilemma in the U.S.-China Military Space Relationship” Asian Survey Vol. 51, No. 2, March/April 2011, pg 317-319

Chinese strategists certainly **perceive** the U.S. quest for space dominance as damaging to China's national security; whoever controls space will have the edge in winning the next war. Indeed, Chinese military and civilian strategists argue that the U.S. search for "absolute security" jeopardizes other countries' security. It is widely reported in Chinese military literature that the U.S. has already developed and is in fact implementing a master plan for military dominance in space, the challenge for China is to prevent the U.S. from jumping too far ahead. As observed by a major study organized by the General Staff of the PLA. "In recent decades the U.S. has been consistently pursuing dominance in space in order to become its overlord."" The study also points out that the U.S. is the first country to develop a full set of doctrines for space militarization and dominance:

In April 1998, the U.S. Space Command published its long-term strategic development plan, Vision for 2020, which specifically proposed the concept of space dominance and revealed the goals of allowing the American military to use space weapons to attack the enemy's land, sea, air, and space targets. World opinion believes this represented the formal debut of U.S. space war theory and indicated an important first step by the U.S. military toward space Li Daguang, one of the most influential PLA experts on space war, also alleges that the U.S. has initiated "a new space war" to maintain its status as "the overlord of space." He claims that the ultimate goal of the U.S. space program is to "build a powerful military empire in outer space that attempts to include any space between earth and moon under American jurisdiction." Under this empire, "without U.S. permission, any country, including even its allies, will not be able to use outer space for military or other purposes."20

**One particular concern** for the Chinese military is that the U.S. may no longer be content with merely militarizing space, which involves extensive use of satellites for military operations. **Instead, weaponization of space is on the agenda**. The PLA now believes that the U.S. is on the verge of important breakthroughs in the development of weapons for space war. As one study claims: "Currently, the U.S. military already possesses or will soon possess ASAT technologies with real combat capabilities, such as aircraft-launched ASAT missiles, land-based laser ASAT weapons, and space-based energy ASAT weapons. "I Moreover, the PLA suggests that the U.S. is trying to acquire space-based weapons to attack targets on earth:

The U.S. military is developing orbital bombers, which fly on low altitude orbits, and when given combat orders, will re-enter the atmosphere and attack ground targets. This kind of weapon has high accuracy and stealth capability, and is able to launch sudden strikes, these capabilities make it impossible for enemies 10 defend against. Orbital bombers thus can strike at any target anywhere on the planet. It is the major means for the U.S. military to perform global combat in the 21st century.22

This **perception of the American lead in space** militarization and attempts for its **weaponization is a major motive for the Chinese military to develop similar projects and thus avoid U.S. domination in future wars.** The PLA believes that control of the commanding heights will decide the outcome of future wars, and China cannot afford to cede that control to the U.S. As a result, space war is a key component of the PLA Air Forces (PLAAF) new doctrines. In 2006 the PLAAF released a comprehensive study called Military Doctrines for Air Force, which makes the following statement:

### Current BMD developments has caused China to build ASATS--- weaponization causes inevitable arms race

Zhang 11—Baohui Zhang, PhD and Associate Professor of Political Science and Director or the Center for Asia Pacific Studies at Lingnan University, “The Security Dilemma in the U.S.-China Military Space Relationship” Asian Survey Vol. 51, No. 2, March/April 2011 pg. 322

Chinese strategists believe that the U.S. military space program, to a significant extent, is driven by missile defense. For example, in a study organized by the General Staff of the PLA, Major General Xu Hezhen charges that the U.S. is developing space-based laser weapons for missile defense. According to him. "A total of 14— 24 satellites deployed on different orbits will constitute a defensive system. Relying on data from early warning systems, it can intercept ballistic missiles launched from anywhere in the world."26

In another study. Major General Ling Yongshun argues that the U.S. is implementing a coherent plan to neutralize other countries' strategic deterrence through the deployment of space-based missile defense. As he observes:

Using space weapons to attack ballistic targets is a major goal of space weapon development. The U.S. believes that others' ballistic missiles pose significant threats to its security. To be immune from this threat, the U.S. is putting major efforts into ballistic missile defense, with space-based weapons being one of the important intercepting platforms.27

In October 2008, the U.S. Congress approved $5 million for an independent study of possible space-based missile defense. This move gravely alarmed the Chinese military, which believed that the deployment of space-based missile defense could become inevitable. In fact, some PLA experts have claimed chat "Star Wars has come back."^ Li Daguang even charged that this decision by the U.S. Congress amounted to "declaring a new Cold War against China.”

Chinese military strategists believe U.S. missile defense poses a real threat to Chinas nuclear deterrent. Until recently, the Chinese military tended to believe that U.S. missile defense could not effectively deter a major nuclear power like China or Russia. It was thought that a range of counter measures, such as deploying decoys and multiple warheads, could be employed to deceive and overwhelm U.S. missile defense. Now, however, with the maturing of a multilayered missile defense system by the U.S. and its allies, Chinese nuclear experts are losing confidence in Chinas offensive capabilities. This pessimism was illustrated in a 2008 interview of Wang Wenchao in a Chinese military magazine. Wang, credited with being the chief designer of China's sea-based strategic missiles, expressed grave pessimism about Chinas offensive nuclear capability against U.S. missile defense. He said, "I have done research: Facing a multi-tiered missile defense system, if any single layer can achieve a success rate of 70%, then 100 single warhead missiles could all be intercepted even if they are mounting a simultaneous attack."-10

This is why Wu Tianfu—arguably the most important deterrence strategist of the Second Artillery of the PLA, which runs Chinas strategic nuclear forces—charges that the U.S. has "forced China to engage in a space arms race."" More specifically, **U.S. missile defense has forced China to integrate space war with its strategic nuclear deterrence. China must possess the ability to weaken American space-based assets such as early-warning satellites, to ensure the credibility of its own offensive nuclear forces**. Thus, **space war and nuclear war are now intertwined** in Chinese strategic thinking. Indeed, China's official media have credited Wu with establishing the PLA's first space war research institute.12

Shen DingU, a prominent Chinese nuclear expert, also states that the January 2007 ASAT test was crucial for Chinas nuclear deterrence: "When an America with both superior nuclear and conventional arsenals aspires to build missile defense, China's response is first to oppose it verbally, then counter it with action if the U.S. refuses to stop. China cannot afford to lose the effectiveness of its still-limited nuclear deterrent.""

The result is China pursuing an emerging integrated space-nuclear strategy. As argued by I iou Xiaohe and Zhang Hui, strategists at the PLA National Defense University, space warfare will aim at the eyes and ears of missile defense, which are early-warning satellites and other sensors deployed in space. Chinas ability to cripple these U.S. space assets will significantly weaken the effectiveness of American missile defense, allowing less time and providing less accurate information to guide ground-based interceptors toward the incoming missiles. The strategists also point out that this strategy is more cost-effective than merely expanding Chinas nuclear missiles: "Using limited resources to develop anti-satellite weapons to attack enemy space assets that are costly and easily damaged will become an important choice for weaker countries."1'

Lieutenant General Ge Dongsheng gives the most systematic elaboration of the new integrated space-nuclear strategy: "Developing space capability and creating a new type of integrated space-nuclear strategic force is the guarantee of effective deterrence and counter-strike." According to General Ge, this strategy is now a necessity) with [he emerging link between space war and nuclear deterrence: With the development and integration of space and information technologies, we must recognize that early warning, surveillance, tracking, communication and guidance, which are all critical for nuclear war, arc increasingly dependent on space systems. Thus, improving nuclear capability through space capability is now an unavoidable trend. We therefore must accelerate the development of space capability to create a new type of integrated space-nuclear strategic force. . . . through anti-satellite weapons, we can clear a pathway for nuclear missiles so that our nuclear force can survive, effectively penetrate, and accurately hit targets."

The Chinese effort to integrate nuclear and space warfare capabilities is an inevitable response to the security dilemma created by U.S. missile defense. As Joan Johnson-Freese and Thomas Nicols point out, "It is unsurprising that other nations would logically view the same capability as a direct threat to the effectiveness of their own nuclear deterrent." They argue that given the very limited size of the Chinese nuclear deterrent, U.S. missile defense has forced China to pursue space war capabilities as a countermeasure.\*

## China CTBT Link

### Space weapons prevent Beijing’s ratification of CTBT—it’ll develop nukes

Zhang 10—Hui Zhang, Harvard Physicist and Specialist in Nuclear Arms Control and Chinese Nuclear policy issues, and is leading a research initiative on China’s nuclear policies for Harvard, “China’s Perspective on a Nuclear-Free World” April 2010, pg 148

Most likely, Beijing's ratification of the CTBT will follow Washington's ratification, which Obama had stated would be a priority. If Washington fails to ratify the treaty again for whatever reason, Beijing may continue to wait. Even worse, if the United States intends to resume nuclear tests and its missile defense and space weaponization plans move forward and threaten the Chinese deterrence capability even more, it could make Chinese ratification more difficult. Under those circumstances, China may feel the need to conduct additional nuclear tests and develop new warheads that include decoys or maneuverable warheads to counter any developments in U.S. missile defense capability.

## China FMCT Link

### Space weapons cause Beijing to increase ICBM capability and de-rails FMCT negotiations

Zhang 10—Hui Zhang, Harvard Physicist and Specialist in Nuclear Arms Control and Chinese Nuclear policy issues, and is leading a research initiative on China’s nuclear policies for Harvard, “China’s Perspective on a Nuclear-Free World” April 2010, pg 149

Beijing's recent position on an FMCT is that such a treaty would be "conducive to preventing nuclear weapons proliferation and promoting nuclear disarmament." China has advocated negotiations to "conclude at an early date a multilateral, non-discriminatory and internationally and effectively verifiable FMCT, based on a comprehensive and balanced program of work acceptable to all."39

China is believed to have stopped its production of highly enriched uranium (HEU) in 1987 and production of plutonium for weapons purposes around 1991.

**Due to its concerns about U.S. missile defense and space weapons plans**, however, China had stated its willingness to simultaneously discuss an FMCT and the prevention of an arms race in outer space (PAROS). In 2003, China dropped its insistence on a formal linkage between an FMCT and the PAROS negotiations and agreed to a negotiation of an FMCT alone. The United States, however, proposed an FMCT without verification in 2004, essentially blocking the restarting of negotiations yet again, although Ohama declared in Prague that "the United States will seek a new treaty that verifiably ends the production of fissile materials intended for use in state nuclear weapons."40

Although China's recent position on an FMCT is to support the negotiations, the reference to "a comprehensive and balanced program of work acceptable to all" could mean a consideration of space weapons issues. In practice, **if Beijing remains concerned about U.S. missile defense, one optional countermeasure for China is to build more ICBMs** (even though its current stockpile is sufficient), which would mean a need for more plutonium and HEU to fuel those weapons, ultimately hurting Chinas support of an FMCT. China may go so far as to be unwilling to negotiate or join an FMCT under those circumstances.41 In other words, U.S. missile defense and space weapons plans will affect China's willingness to participate in an FMCT negotiation.

## Impact: Accidental Nuke War

### **Space Race create irreversible nuclear proliferation**

Matthews 10 – Jessica T. Matthews, president of the Carnegie Endowment for International Peace, “Outer Space: Weapons, Diplomacy, and Security”, Carnegie Endowment for International Peace, pg vii

Several recent attempts to develop legal barriers to a space race have failed. But, the authors argue, an agreement on a framework governing space-which lacks borders-must be reached. If outer space should fill with weapons-including highly survivable space systems and information transmission systems used for military purposes—the risk of accidents, false alarms, and command system malfunctions becomes substantial.

The potential risks increase as nations with growing political, military, and economic ambitions—notably China, India, and Pakistan—quickly develop expertise. Their **use of space** information systems **for military purposes could create a tipping point that would make reversing an arms race impossible**. If countries fail to find areas of cooperation, the growing threat of a space arms race and the prospects of conflict in space would inevitably lead to nuclear and missile proliferation, and create an irreversible crisis for the entire nonproliferation regime.

### **Space race causes accidental nuclear war**

Broad 7**--** William Broad, Pulitzer prize winning journalist for the New York Times, “Look Up! It's No Meteor, It's an Arms Race” January 21, 2007, Section 4; Column 1, pg 3

But the prospect of a new arms race in space is also energizing an opposition, including arms control supporters and fiscal conservatives alarmed at the rising costs of the Iraq war. Treaties could short-circuit the costly game of measure-countermeasure on the high frontier before it expands any further, they say. Currently, no international treaty or domestic law forbids such developments. An unfettered arms race could hurt the United States more than any other nation, arms control advocates argue. The United States owns or operates 443 of the 845 active satellites that now orbit the planet, or 53 percent. By contrast, China owns just 4 percent. ''We not only have the most satellites but they are more integrated into our economy and our way of making war than any other country,'' said Laura Grego, a staff scientist at the Union of Concerned Scientists, a private group in Cambridge, Mass., that takes liberal positions on arms issues and environmental issues. ''We have the most to lose in an unrestrained arms race.'' But that logic has not persuaded the Star Wars advocates, who say the United States needs to protect its huge investment in space satellites by being ahead of anyone else in shooting such devices out of the sky. Diplomats from around the globe have gathered in Geneva for many years to hammer out a treaty on the ''Prevention of an Arms Race in Outer Space,'' which would ban space weapons. Arms control supporters say China and Russia have backed the process, while the United States has dragged its feet. Last year, John Mohanco, a State Department official, told the diplomats in Geneva that as long as attacks on satellites remained a threat, ''our government will continue to consider the possible role that space-related weapons may play in protecting our assets.'' A Heritage Foundation analysis of such diplomacy says China is charging ahead to build space arms while ''seeking to block the United States from developing its own anti-satellite weapons and space-based ballistic missile defense systems.'' China's strategy, the analysis says, is clear: ''Work on public opinion in the United States to make moral arguments against weapons in space, develop international coalitions to limit the way that the United States can use space, and develop China's own weapons systems and tactics to destroy American satellites and space-based weapons.'' But Theresa Hitchens, a critic of the administration's space arms research who is director of the Center for Defense Information, a private group in Washington that tracks military programs, said that China's antisatellite test might be ''a shot across the bow'' meant to prod the Bush administration into serious negotiations. In the test, a Chinese missile pulverized an aging Chinese weather satellite more than 500 miles above Earth on Jan. 11. Ms. Hitchens warned that an arms race in space could easily spin out of control, noting that India has been ''rattling its sword'' and some experts in that country are openly calling for antisatellite arms. **A global competition that produced armadas of space weapons,** she added, **could raise the risk of accidental nuclear war** if, for instance, a whirling piece of space junk knocked out a spy satellite. ''How do you know it's not a precursor to a nuclear attack?'' she asked. ''Do you have an itchy trigger finger? If you've got a lot of satellites out there, you probably do.''

### Causes accidental nuke war

Hitchens and DeBlois 5—Theresa Hitchens is a Vice President Center For Defense Information Moderator and Bruce DeBlois is Director Of Systems Analysis, Center For Transformation, Bae Systems, “"The Weaponization Of Space: Implications For U.S. National Security"” April 6, 2005, Federal News Service

Right now the Air Force in particular is pushing a strategy of space warfare that would see the United States fighting in, from and through space. And it's my belief that this is an extremely dangerous strategy. It's one that will undercut and not enhance U.S. national security. It will create a situation where all of our satellites are targets, whereas right now no one is threatening us in space. **Simply deploying any** satellite weapons or **space weapons -- not even using them -- could increase the odds of accidental war, including accidental nuclear war, and escalate conflicts in a crisis situation.** Now I'm not making that up. The Air Force has found similar things in the war games that they've conducted over the past several years. Space weapons cannot protect our satellites. There are other ways of protecting our satellites, but weapons cannot do it. They are inherently vulnerable assets, just like satellites themselves. There isn't any place to hide in space, so when something's on orbit, it has inherent vulnerabilities. Weapons are not the answer for protecting our national security assets.

## Impact: Space Debris

### Space weapons would increase space debris past the tipping point

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

Space debris is already a serious concern that would be **intensified** by the testing or use of explosive weapons in space or, for that matter, of hit-to-kill intercept of satellites. n37 Recognizing the dangers of orbital pollution, most of the international space community have implemented strict (but voluntary) regulations for the safe disposition of spent boosters and other space trash. n38 Nonetheless, U.S. Space Command currently tracks nearly 10,000 objects in orbit, ranging in size from several centimeters to many meters, only about 600 of which are operational satellites. Low earth orbits are to some degree self-cleaning, due to atmospheric drag; however, objects in higher orbits linger for decades or millennia. Concern for debris is evident in measures taken thus far by the Missile Defense Agency to minimize the overall amount of debris in space by testing its KKV intercept on downward trajectories of suborbital targets, at low altitude. A collision or explosion at a given altitude cannot produce debris in orbit above that altitude; so a test at an altitude for which the drag-induced debris decay is short does not produce an enduring debris problem. And if a collision takes place in LEO at an altitude 200 kilometers above the short-decay altitude, only that debris from the satellite that maintains orbital speed to some accuracy, and is not emitted at a significant angle below or above the horizontal, can remain in orbit. Specifically, with the Earth radius of some 6,400 kilometers, tests at 200 kilometers above the decay altitude can yield orbital debris fragments only from those particles that are emitted within about two degrees of the horizontal and with no more speed loss than about 200 meters per second.

### SMD causes adversaries to target our space assets with countermeasures causing an increase in space debris and loss of SSA

Hitchens and Samson 4 – Theresa Hitchens, Vice President of the Center for Defense Information, Victoria Samson, research associate for the Center for Defense Information, Summer/Fall 2004, Georgetown Journal, Star Wars Redux, Vol. 5, No. 2, Center for Defense Information, http://www.cdi.org/news/space-security/space-based-interceptors.pdf

The mere act of weaponizing space will set in motion a series of moves by other countries that would threaten U.S. space assets. Despite the wide gap in capabilities and spending between the U.S. military and the rest of the world in space plans, the United States can be rendered vulnerable by relatively inexpensive, rudimentary technologies. If other countries genuinely believe that the United States intends them harm using space assets, these counteractions cannot be ruled out. Regular ballistic missiles could possibly be modified to provide anti-satellite capabilities. U.S. ground stations could be attacked, harming command and control to the point where space systems would be made worthless. A low yield nuclear warhead placed on a ballistic missile could menace satellites in Low Earth Orit. Or something as basic as gravel, unleashed at the right time against a satellite, might degrade U.S. space capabilities to a dangerous low. Along those lines, orbital debris from space weapons cannot be overlooked. The smallest chips can prove lethal at the astonishing high speeds in which objects orbit the earth- some 10 km per second in Low-Earth Orbit. The destruction of satellites or space weapons would undoubtedly spawn scores of dangerous new objects that could collide with satellites and spacecraft. Presently, the U.S. Air Force’s Space Surveillance Network tracks some 13,000 on-orbit objects, only about 6 percent of which are working satellites and spacecraft, the rest being debris. While improving U.S. space situational awareness is currently a high priority for the Air Force, space weapons would only add to this already-challenging space surveillance mission.

## \*\*POLITICS\*\*

## Plan Unpopular

### Weaponizing space is politically unpopular

Sheenan 7 – Mike Sheenan, professor of IR at University of Swansea, “The International Politics of Space”, Series: Space Power and Politics, ed. Everett C Dolman and John Sheldon, page 121

While there may be clear military rationales in favour of the weaponisation of space by the United States, it is a decision that would have considerable political implications. It is also true that to date there have always existed powerful cultural and political domestic obstacles in the United States to such a development. Even at the outset of the space age leading US politicians speculated on the idea of space as a force for peace rather than a theatre of war. House Majority Leader McCormack suggested in 1958 that the exploration of space had the potential to encourage a revived understanding ‘of the common links that bind the members of the human race together and the development of a strengthened sense of community of interest which quite transcends national boundaries’.84 President Kennedy similarly suggested that it was ‘an area in which the stale and sterile dogmas of the Cold War could be literally left a quarter of a million miles behind’.85 US National Space Policy states that the United States is committed to the exploration and use of outer space ‘by all nations for peaceful purposes and for the benefit of all humanity’.86 US national space policy does allow for the use of space for the purpose of national defence and security, but nevertheless, the weaponisation of space would seem to run counter to a very long-standing national policy. Similarly, the US National Security Strategy declares that uninhibited access to space and use of space are essential to American security. Space policy objectives include protecting US space assets, ‘preventing the spread of weapons of mass destruction to space, and enhancing global partnerships with other space-faring nations across the spectrum of economic, political and security issues’.87 It is also notable that the US armed forces are aware of the need to respect the concept of space as a ‘global commons’, so that if ‘the United States impedes on the commons, establishing superiority for the duration of a confl ict, part of the exit strategy for that confl ict must be the return of space to a commons allowing all nations full access’.88 Current US military space doctrine is careful to emphasise the political implications of military operations in space and the need to be sensitive to legal issues. USDD 2-1.1, Counterspace Operations, insists that ‘in all cases, a judge advocate should be involved when considering specifi c counterspace operations to ensure compliance with domestic and international law and applicable rules of engagement’. 89

### Space weapons are politically destabilizing

Marks 6—Paul Marks, award winning journalist and chief technology correspondent to New Scientist, April 15, 2006, “Space weapons could make orbit a no-fly zone; The Pentagon plans to spend $1 billion inventing weapons to attack satellites. Is that such a good idea?” New Scientist, Technology; Feature; Pg. 30

The CDI fears that the Pentagon might surreptitiously build up a weapons infrastructure by sending systems like these into space, ostensibly as prototypes for testing, and simply leaving them there. This would allow space weapons **to** become a fait accompli without **congressional or public debate**. "**Space weapons are extremely destabilising politically** so the DoD is getting around any debate by developing systems it says are just designed to test their capabilities," says CDI analyst Victoria Samson. "The Pentagon simply finds it easier to ask for forgiveness later rather than for permission now." It is not just the political aspect of weaponising space that is causing concern. Near-Earth space could suffer serious pollution if anti-satellite (ASAT) weapons are used. An international relations conference in San Diego, California, heard on 25 March that destroying satellites would create large amounts of orbiting debris that could have a devastating effect on other spacecraft. "The potential for debris due to space weapons use was a big issue," says David Webb of Leeds Metropolitan University in the UK. "Even some in the American military were against using anti-satellite weapons owing to the debris issue."

### Weapons in space are politically unpopular

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

IN SUM: GLOBAL FORCE PROJECTION. Global rapid and denied-access force projection is possible and will happen without the development of space weapons, through adaptations to existing systems. Except for the unique capability that might be contributed by space-based lasers for a small class of targets, terrestrial methods of force projection appear to be superior to space weapons systems, if they were to become a reality at some point in the future. Furthermore, **space weapons will be expensive, vulnerable to countermeasures, and politically inflammatory.** The question of whether to deploy space weapons, therefore, becomes a matter of marginal value added and opportunity costs. In the near term, **nonspace weapons** such as UAVs, cruise missiles, and ICBMs with conventional payloads will provide greater capability sooner and at lower cost.

### Any supporter of the plan is in the minority—it’s unpopular in Congress

Tannenwald 3 – Nina Tannenwald, Associate Research Professor at Brown University's Watson Institute for International Studies, Yale Journal of International Law. April 2003, online: <http://www.cissm.umd.edu/papers/files/tannenwald.pdf>

Although SPACECOM and its supporters aggressively assert their views, advocates of weapons in space may be in the minority, even in the Pentagon. As many observers recognize, the interests of the United States in space are much broader than SPACECOM presents. U.S. testing and deployment of orbital weapons could make using space for other military and commercial purposes more difficult. Many in the military, especially those involved in crucial military support activities, are quietly aware of this, as are officials at NASA and the international space station, and their supporters in Congress. 26 Congressional support for antisatellite (ASAT) programs does not appear to be deep or widespread. Serious questions remain as to whether the threats to U.S. assets in space are really as great as SPACECOM argues, and whether, even if the threats were real, expensive and difficult space-based weapons would really be the most effective way to deal with them. In many cases, those wishing to hurt the United States will likely find it much easier, and more effective, to attack terrestrial targets. 27

### Weapons gut capital

Hays 2—Peter Hays, PhD in Comparative Military Studies and Lieutenant Colonel in USAF, March 27, 2002, “PATHS TOWARD SPACE WEAPONIZATION” online: http://isanet.ccit.arizona.edu/noarchive/hays.html

Who. The full range of groups who would support or oppose space weapon deployment and informed public opinion on this issue have yet to emerge because there are no near-term plans to actually deploy such systems. Movement toward openly deploying space weapons is sure to generate a great deal of controversy and debate that may reconfigure the domestic political landscape. For this reason, both opponents and supporters know it is important to lay the proper foundation and are attempting to frame the context in which this public policy debate will take place. Opponents include center to left wing public policy interest groups such as the Federation of American Scientists, many academics, and a wide array of groups who support arms control, oppose arms races, or object to weaponization in general on moral or ethical grounds. Some of the opposition groups are the same or have emerged from the groups that opposed President Ronald Reagan’s Strategic Defense Initiative (SDI) and they are primarily concerned with preserving what they view as a stable mutual hostage relationship between nuclear-armed states. Other groups oppose movement toward space weaponization in the post-Cold War era more broadly because they oppose a more activist and militarized approach to American Foreign Policy. Depending on the scale and expense of proposed space weapons systems, all opponents can call on support from all those opposed to increased military spending. Supporters include center to right wing public policy interest groups such as the Heritage Foundation, the aerospace companies who expect to build the system and their congressional representatives, research and development laboratories within the military industrial complex, and the groups within the military that would operate space weapons and would probably be drawn primarily from the Air Force. Mainstream views on weaponizing space can also be grouped into four major camps: space hawks, inevitable weaponizers, militarization realists, and space doves.[22] Each of these camps is described below and they are used to analyze sources of support or opposition for attempts to control space weaponization. Space Hawks believe that space already is or holds the potential to become the dominant source of military power. Accordingly, they advocate that the United States move quickly and directly to develop and deploy space weapons in order to control and project power from this dominant theater of combat operations. According to Senator Bob Smith (R-NH), for example, the concerted development of American space weapons “will buy generations of security that all the ships, tanks, and airplanes in the world will not provide. . . . Without it, we will become vulnerable beyond our worst fears.”[23] In addition, space hawks often point to space-based BMD as a potentially decisive weapon capable of fundamentally reordering the strategic balance. Space Hawks tend to oppose virtually all space-related arms control or regulation because of its potential to slow or derail rapid and direct space weaponization by the United States. Inevitable Weaponizers maintain that space, like all other environments man has encountered, will eventually be weaponized. They differ from space hawks in two important ways: they are not convinced that space weaponization would be beneficial for U.S. or global security and they are unsure that space will prove to be the decisive theater of combat operations. The Space Commission report is a good example of this camp: “we know from history that every medium—air, land and sea—has seen conflict. Reality indicates that space will be no different. Given this virtual certainty, the U.S. must develop the means both to deter and to defend against hostile acts in and from space.”[24] Inevitable weaponizers take a nuanced view of space arms control and regulation. They generally support confidence- and security-building measures (CSBMs) and other mechanisms designed to slow military competition and channel it in predictable ways. But they are less supportive of broad efforts to ban space weapons because they see them as futile or even dangerous due to their potential to lull the United States into complacency or otherwise cause it to be outmaneuvered by states that successfully circumvent space weaponization accords. Militarization Realists oppose space weaponization because they believe U.S. security interests are best served by the status quo in space. They believe that the United States has little to gain but much to lose by weaponizing space because it is both the leading user of space and, enabled by this space use, the dominant terrestrial military power. Militarization realists also believe that if the United States takes the lead in weaponizing space, it would become easier for other states to follow due to lower political and technological barriers. For these reasons, militarization realists believe that “fighting into space looks feasible and we should plan for the eventuality. Fighting in space shows little promise, while fighting from space looks impractical for the foreseeable future, with or without treaties.”[25] Militarization realists support space-related arms control and regulation that precludes other states from weaponizing or even militarizing space. Most of them believe, however, that this support must be balanced against the increased attention that formalized arms control efforts could draw to the United States’ already formidable space-enabled force enhancement capabilities and the political, military, and arms control fallout this increased scrutiny might cause. Finally, a wide range of organizations and viewpoints can be grouped together as Space Doves because they all oppose space weaponization for a variety of reasons including moral, arms control, conflict resolution, stability, and ideology arguments. Most space doves also oppose any militarization of space beyond the limited missions they see as stabilizing—national technical means of arms control verification (NTMV), early warning, and hotline communications—because they see any military missions beyond these as the “slippery slope” to space weaponization. Most space doves emphasize how destabilizing most space militarization and all space weaponization would be. “Unlike the strategy for nuclear weapons, there exists no obvious strategy for employing space weapons that will enhance global stability. If the precedent of evading destabilizing situations is to continue—and that is compatible with a long history of US foreign policy—one ought to avoid space-based weapons.”[26] They also highlight the deep roots of President Eisenhower’s “space for peaceful purposes” policy and argue that, especially in the post-Cold War era, there is no rationale for space weaponization that is strong enough to overturn the basic strategic logic America developed at the opening of the space age. Space doves support space arms control and regulation more strongly than any other camp. Since they do not believe the United States (or other states) would reap strategic benefits from weaponizing space, they are not overly concerned about the numerous arms control challenges identified by the other camps. Moreover, like Paul Stares, most space doves would not support using two track approaches to space arms control. What and Where. Both **opponents** and supporters **are most likely to target public opinion and Congress**. Opponents have and will continue to advance a number of arguments against space weapons: they are not necessary and will cause an arms race in space; weapons in space would not necessarily be effective at defending vulnerable but very threatening systems—a highly destabilizing situation better addressed by arms control than by weaponization; space weapons would undercut the engine of growth for space, commercial space activities, and to date there has been almost “no demand from the operators of commercial communications satellites for defense of their multibillion dollar assets.”[27] Supporters are likely to counter by arguing that space weapons will have some significant degree of self-defense capability and that some level of defense is better than none, explaining how valuable space weapons could be in a wide range of applications from the tactical through the strategic levels, arguing that space has important strategic utility well beyond just commercial applications, and showing how many jobs could be created in developing and deploying these systems.

## Plan Popular

### Missile Defense is bipartisan

Lambakis 7—Steven Lambakis, senior analyst in spacepower and policy studies at the National Institute for Public Policy, February 1, 2007, “Missile Defense From Space” Hoover Institution, Policy Review No. 141, online: http://www.hoover.org/publications/policy-review/article/6124

After more than 60 years of advances in ballistic missile technologies, we have only just begun to address our vulnerability to them. **Missile defense is a policy and budgetary reality today, and it enjoys strong bipartisan support**. Current U.S. efforts to dissuade other countries from investing in ballistic missiles, to assure U.S. allies, and to deter aggression put missile defense in a place of prominence. Bush Administration policy is to evolve the fielded system incrementally to defend against these threats. The system is intended to adapt to new threats as they emerge and integrate advanced missile defense technologies as they are introduced.

### Weapons are popular

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## \*\*\*AT ADVs\*\*\*

## \*EMP\*

## 1NC EMP F/L

### Weapons don’t solve jamming—status quo contingencies solve

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

ELECTRONIC WARFARE. Neither would space weapons easily resolve the often-cited threat of electromagnetic jamming -- unsuccessfully employed against U.S. Global Positioning Satellite (GPS) systems in Iraq. In time of war, as demonstrated in Iraq, ground- or air-launched munitions (in some cases guided by the enemy jammer's own signals) can be a direct and effective countermeasure to ground-based jamming. n24 In the face of more persistent jamming, ground- or air-deployed pseudosatellites, so-called pseudolites, could boost GPS and other satellite signals in a local area. For example, an unmanned aerial vehicle transmitting GPS signals from an altitude of 20 kilometers (60,000 feet) would provide 10,000 times the received signal strength on Earth as a GPS satellite with equivalent transmission energy. Such augmentation would reduce by a factor of 100 the effective radius of a GPS jammer -- or, conversely, increase by a factor of 10,000 the power required to jam the original area, a significant improvement insofar as robustness is concerned. Furthermore, a GPS transmitter on an unmanned aerial vehicle could radiate ten times the power of a GPS satellite, rendering hostile jamming efforts more difficult by a further factor of 10.

n24. Robert Wall, "The Next Space War," Aviation Week & Space Technology, July 28, 2003, p. 27.

Neither "hacking" (unauthorized intrusion into satellite control networks), "spoofing" (fake instructions to a satellite), nor ground-based jamming of command links could be significantly mitigated by space weapons. A space mine closely accompanying a U.S. satellite could easily jam its command link. Destructive attack on the little jammer could readily provoke an instantaneous and automatic destruction of the jammed satellite, limiting the utility of such a protective space weapon once the space mine was in place.

### An EMP is out of reach for our adversaries and is unlikely to cause lasting damage even if they have one

Farley 9 – Robert Farley, assistant professor at the University of Kentucky’s Patterson School of Diplomacy and International Commerce, 10-22-09, “Neocons Salivating Over Their Next Great Exaggerated "Threat": Electromagnetic Pulse Attack” http://www.alternet.org/media/143455/neocons\_salivating\_over\_their\_next\_great\_exaggerated\_%22threat%22%3A\_electromagnetic\_pulse\_attack/?page=entire

Many weapons experts doubt that an EMP attack could cause lasting or irreversible damage. Stephen Younger, former senior fellow at Los Alamos National Lab and director at the Defense Threat Reduction Agency, argues that while an EMP might create problems in the short term, it is unlikely to cause long-term devastation.

Similarly, observers have questioned the capacity of North Korea or Iran, much less a terrorist organization, to develop a warhead sophisticated enough to cause widespread EMP damage. Nick Schwellenbach, a former researcher at Project on Government Oversight, suggests that the idea of a small, EMP-optimized warhead is absurd: "You have a lot of points of failure in order to get to a warhead that is EMP optimized. … [Y]ou need specialized machine tools, you need capital, but to create a weapon that creates the secondary effect that you're talking about, that's something even we can't do right now.”

### EMP scare tactics are politically motivated for the advancement of missile defense- takes away credibility from their authors

Farley 9 – Robert Farley, assistant professor at the University of Kentucky’s Patterson School of Diplomacy and International Commerce, 10-22-09, “Neocons Salivating Over Their Next Great Exaggerated "Threat": Electromagnetic Pulse Attack” http://www.alternet.org/media/143455/neocons\_salivating\_over\_their\_next\_great\_exaggerated\_%22threat%22%3A\_electromagnetic\_pulse\_attack/?page=entire

The central political purpose of the EMP awareness movement appears to be advancement of the cause of missile defense. The most extreme estimates of the effect of EMP restore the Cold War-era existential fears of nuclear war. Schwellenbach argues "what's driving it is the political global context—it gives the right an issue that allows them to justify hawkish behavior. It is almost a perfect solution to any argument against missile defense—North Korea and Iran.”

The 90 percent casualty estimate advanced by EMP awareness advocates hypes the notion that the United States faces potential annihilation at the hands of its enemies, and goes a step farther: even the smallest nuclear power can destroy the United States with a small number of warheads. This, in turn, reaffirms the need for both a secure missile defense shield (including space-based interceptor weapons) and a grand strategy of preventive war against potential nuclear and ballistic missile proliferators. Almost all EMP awareness advocates—including Gaffney, Gingrich, and Huckabee—call for increased spending on missile defense. Gaffney and Gingrich have also called for a “robust” policy of preemptive war, including attacks on Iranian and North Korean missiles on their launching pads

## --XT: Scare Tactic

### EMPs are poorly researched, allowing it to be used as a scare tactic, EMP commission report has been questioned by multiple experts

Farley 9 – Robert Farley, assistant professor at the University of Kentucky’s Patterson School of Diplomacy and International Commerce, 10-22-09, “Neocons Salivating Over Their Next Great Exaggerated "Threat": Electromagnetic Pulse Attack” http://www.alternet.org/media/143455/neocons\_salivating\_over\_their\_next\_great\_exaggerated\_%22threat%22%3A\_electromagnetic\_pulse\_attack/?page=entire

The fact that EMP is poorly researched and not well understood works in its favor as a scare tactic. Since evidence of EMP’s allegedly lasting impact is purely theoretical EMP awareness advocates can make outlandish claims regarding the threat that even the smallest nuclear arsenal poses. They can also point to allegations made by the official EMP Commission, ignoring the fact that many outside experts dispute its findings.

The Niagara conference’s emphasis on strategic and policy considerations shows that alarmist predictions about EMP attacks serve as fodder for promotion of a larger nuclear weapons stockpile, for missile defense, and for preventive attacks.

## --XT: No Adversaries

### Iran and North Korea are unlikely to launch an EMP attack, and even if they are, the solution is hardening infrastructure not SMD, EMP scare tactics are only used by the right to try to gain SMD funding

Crowley 9 - Michael Crowley, senior correspondent and deputy Washington bureau chief for Time magazine, 6-3-09, “The Newt Bomb” The New Republic, http://www.tnr.com/article/the-newt-bomb

The EMP commission actually had a point. There is a scientific basis for fears about widespread electric outages, and there is evidence that other countries, possibly including Iran, have studied the technique. "EMP is real," agrees Joe Cirincione, a nuclear weapons expert who now runs a pro-disarmament think tank, the Ploughshares Fund. But, as Cirincione notes, few analysts take the threat very seriously. The odds that Iran or North Korea would prefer a technologically untested Rube Goldberg scheme to merely nuking us seem slim. And any terrorist group able to execute such a plan was probably capable enough to get us one way or another anyhow.

Those realities argue overwhelmingly for prudent but unsexy infrastructure protections, not preemptive attacks or advanced technology. "It's horror theater," says Cirincione, "trying to scare Americans into doing something which a rational analysis would stop them from doing." Charles Ferguson, a nuclear engineer at the Council on Foreign Relations, agrees. "[T]here are some important things we can be doing that won't cost much, but that can serve as a vital backup," he says. For instance, Ferguson has advised the New York City Fire Department to keep some backup communications equipment and extra ignition switches for its trucks in electromagnetic pulse-resistant steel cages.

The hawkish right, however, has much bigger things in mind. Although Bartlett himself seems to lack a sub-rosa strategic agenda, he has found common cause among national-security conservatives, about whom the same can't be said. Take, for instance, the spin of Frank Gaffney, perhaps the right's main missile-defense zealot: "[T]he United States must now make a redoubled effort to deploy effective, comprehensive defenses against ballistic missiles that might be used for EMP and other attacks," Gaffney wrote in a 2006 National Review article. Republican Senator Jon Kyl, a key missile-defense champion on Capitol Hill, has held hearings and published a Washington Post op-ed on the EMP threat. The like-minded Wall Street Journal opinion pages have repeatedly flogged the EMP commission's findings. "The only solution to this [EMP] problem," Brian T. Kennedy of the Claremont Institute wrote in an op-ed in the pages last November, "is a robust, multilayered missile-defense system."

### No motive for rogue states to launch an EMP and it is out of reach for terrorist groups

Farley 9 – Robert Farley, assistant professor at the University of Kentucky’s Patterson School of Diplomacy and International Commerce, 10-22-09, “Neocons Salivating Over Their Next Great Exaggerated "Threat": Electromagnetic Pulse Attack” http://www.alternet.org/media/143455/neocons\_salivating\_over\_their\_next\_great\_exaggerated\_%22threat%22%3A\_electromagnetic\_pulse\_attack/?page=entire

EMP awareness advocates have thus far failed to offer a convincing motive for why a rogue state would use its scarce nuclear weapons in a first-strike that might not work, and that would in any case leave the attacker open to a devastating counterattack. EMP as a second-strike deterrent fares no better; the strategic logic of deterrence demands that any retaliatory strike be as lethal and as secure as possible, and it is highly unlikely that any state would rely on unproven weaponry of uncertain lethality to dissuade an attack. While terrorists may have different incentives, the road to a functional EMP capability is much rockier for a terrorist group than a state. At a minimum, the terrorist group would need to acquire and master the operation of a nuclear weapon and a ballistic missile, two steps further than any known group has gone

## --XT: Hardening Key

### EMP Commission recommends hardening of financial infrastructure to reduce the impact of an attack

Graham and Frankel et. Al 8 - Dr. William R. Graham, Chairman of the Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack, and Dr. Michael J. Frankel, Executive Director of the EMP Commission and one of the Nation’s leading experts on the effects of nuclear weapons, April 2008, “Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack,” The Commission to Assess the Threat to the United States from an EMP Attack, http://www.empcommission.org/docs/A2473-EMP\_Commission-7MB.pdf

Securing the financial services industry from the EMP threat and from other threats is vital to the national security of the United States. The Federal Government must ensure that this system can survive sufficiently to preclude serious, long-term consequences.

The Department of Homeland Security, the FRB, and the Department of the Treasury, in cooperation with other relevant agencies, must develop contingency plans to survive and recover key financial systems promptly from an EMP attack.

Key financial services include the means and resources that provide the general population with cash, credit, and other liquidity required to buy essential goods and services. It is essential to protect the Nation’s financial networks, banking records, and data retrieval systems that support cash, check, credit, debit, and other transactions through judicious balance of hardening, redundancy, and contingency plans.

## \*HEG\*

## 1NC Heg F/L

### The US has superpower status in every sector that is unrivaled

Brooks and Wohlforth 8 – Stephen Brooks, Associate Professor of Government at Dartmouth, William C. Wohlforth, Daniel Webster Professor of Government at Dartmouth, “World Out of Balance,” Princeton University Press, http://press.princeton.edu/chapters/i8784.pdf

1This point has been stressed by political scientists, historians, and policymakers. Political scientist G. John Ikenberry observes that “since the end of the Cold War, the United States has emerged as an unrivaled and unprecedented global superpower. At no other time in modern history has a single state loomed so large over the rest of the world.” “Is American Multilateralism in Decline?” Perspectives on Politics 3 (2003): 533. Historian Paul Kennedy stresses: “A statistician could have a wild time compiling lists of the ﬁelds in which the US leads. . . . It seems to me there is no point in the Europeans or Chinese wringing their hands about US predominance, and wishing it would go away. It is as if, among the various inhabitants of the apes and monkeys cage at the London Zoo, one creature had grown bigger and bigger—and bigger—until it became a 500lb gorilla.” “The Eagle Has Landed: The New U.S. Global Military Position,” Financial Times, February 1, 2002. And former secretary of state Henry Kissinger maintains, “The U.S. is enjoying a preeminence unrivaled by even the greatest empires of the past. From weaponry to entrepreneurship, from science to technology, from higher education to popular culture, America exercises an unparalleled ascendancy around the globe.” Does America Need a Foreign Policy? Toward a Diplomacy for the 21st Century (New York: Simon and Schuster, 2001), 17

### **US unipolarity is stable unless the US violates international norms**

Brooks and Wohlforth 8 – Stephen Brooks, Associate Professor of Government at Dartmouth, William C. Wohlforth, Daniel Webster Professor of Government at Dartmouth, “World Out of Balance,” Princeton University Press, http://press.princeton.edu/chapters/i8784.pdf

By the end of the millennium, however, most scholars accepted that unipolarity was not about to erode any time soon, and still the question of U.S. systemic activism was neglected. This inattention can be traced to two prevalent assumptions. The ﬁrst is that any effort to revise the system would be fruitless, costly, or both, in large part because of systemic constraints on the exercise of power. John Ikenberry, for example, stresses the need for the United States “to operate through mutually agreed rules”42 and emphasizes that “the more willing the U.S. is to act within institutional constraints and tie itself to others . . .the less likely it is that states will seek to balance against it or seek to establish a rival international order.” 43 The second assumption is that, in the words of Robert Jervis, “[t]he current international system, although not necessarily perfect, is certainly satisfactory.” 44 These assumptions yield a negative cost-beneﬁt ratio for U.S. efforts to revise the system even if unipolarity will long endure. And if activism makes no sense, then conservatism is the only practical route. This perhaps explains why IR scholars have been so reluctant to address the question of system change, and why they instead counsel the United States to be a “very conservative state” and to “seek to maintain the prevailing international system.” 4

### Too many tech barriers—squo BMD solves

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

Space-based lasers, however, face significant operational barriers. Because the satellite would move with respect to a fixed point on Earth, continuously covering strategically important regions (in clear weather) would require a constellation of several dozen lasers. The lasers would be effective only against a narrow class of targets, such as combustibles, aircraft canopies, and thin-skinned storage tanks. Common military objectives such as bunkers, armored vehicles, and buildings would be basically immune to laser attack. Rudimentary shielding by smoke screens, ablative cork coatings, or even pools of water can provide a substantial and cheap defense for nearly any target. Furthermore, space-based lasers could not attack targets under cloud cover -- on average 30-40 percent of the Earth's surface and some 70 percent of the time in parts of Germany or North Korea.

Space-based lasers would be enormously expensive. For a typical proposed laser system at an altitude of 3,000 kilometers, a target protected by 3 centimeters of cork could withstand about twenty minutes of laser burn time before its surface would be exposed to laser heat. n54 With the orbiting laser consuming fuel at a rate of some 9 kilograms per second, a single twenty-minute "shot" would use 11 tons of fuel. The cost of putting this fuel in orbit would be some $ 240 million per target. n55 At a lower orbit for the lasers, say 1,000 kilometers, allowing a range of 1,500 kilometers, the necessary lasing time per target would drop to five minutes. Fuel costs would fall to $ 60 million per target, although a greater number of lasers would then be required to achieve the same terrestrial coverage.

By comparison, a single Tomahawk cruise missile costs some $ 600,000, could attack heavily armored and nonflammable targets, would not be affected by clouds, and would be expended only when needed. Nearly the entire surface of the Earth, including North Korea, most of the Middle East, and more than half of China (including its principal industrialized regions), is reachable by Tomahawk Block III cruise missiles. n56 Launched from outside the 12-nautical-mile territorial limit, cruise missiles would have a flight time of several hours.

## AT: Deterrence

### SMD has no deterrence value

Butt 10 – Yousaf Butt, nuclear physicist and is currently serving as a scientific consultant to the Federation of American Scientists on missile defense, 5-8-2010, “The myth of missile defense as a deterrent,” The Bulletin of Atomic Scientists, http://www.thebulletin.org/web-edition/features/the-myth-of-missile-defense-deterrent

Second, even if reducing the U.S. stockpile did affect U.S. deterrent posture, missile defense couldn't replace any lost deterrent value because missile defense doesn't deter nuclear attacks. The purpose of missile defense is to defend--or, more accurately, attempt to defend. An adversary wouldn't be deterred from launching a nuclear attack because of the existence of missile defense; rather, it's the credible threat of overwhelming nuclear retaliation that deters an adversary. If the enemy is irrational and suicidal enough to discount the threat of massive nuclear retaliation, then a missile defense system that can theoretically intercept only some of the attacking missiles most certainly isn't going to be a deterrent. In wonk parlance, the NPR conveniently conflates reprisal deterrence with denial deterrence. Reprisal deterrence is the 800-pound gorilla, and denial deterrence is the flea. If our adversaries are thinking twice about using nuclear weapons it's because they're scared of reprisal deterrence. And if they aren't sufficiently scared of reprisal, fractional denial certainly isn't going to stop them. To borrow an analogy used by Thomas Schelling, a Nobel laureate with a deep knowledge of arms control and game theory: Denial deterrence adds to reprisal deterrence like tying an extra cotton string adds to the strength of an aircraft carrier's anchor chain.

### SMD increases the risk of accidental nuclear war with Russia

Graham 5 – Thomas Graham Jr., former senior-level diplomat and a world-renowned authority on nuclear nonproliferation, December 2005, “Space Weapons and the Risk of Accidental Nuclear War,” Arms Control Association, http://www.armscontrol.org/print/1953

The United States and Russia maintain thousands of nuclear warheads on long-range ballistic missiles on 15-minute alert. Once launched, they cannot be recalled, and they will strike their targets in roughly 30 minutes. Fifteen years after the end of the Cold War, the chance of an accidental nuclear exchange has far from decreased. Yet, the United States may be contemplating further exacerbating this threat by deploying missile interceptors in space.

Both the United States and Russia rely on space-based systems to provide early warning of a nuclear attack. If deployed, however, U.S. space-based missile defense interceptors could eliminate the Russian early warning satellites quickly and without warning. So, just the existence of U.S. space weapons could make Russia’s strategic trigger fingers itchy.

The potential protection space-based defenses might offer the United States is swamped therefore by their potential cost: a failure of or false signal from a component of the Russian early warning system could lead to a disastrous reaction and accidental nuclear war. There is no conceivable missile defense, space-based or not, that would offer protection in the event that the Russian nuclear arsenal was launched at the United States.

Nor are the Russians or other countries likely to stand still and watch the United States construct space-based defenses. These states are likely to respond by developing advanced anti-satellite weapon systems.[1] These weapons, in turn, would endanger U.S. early warning systems, impair valuable U.S. weapons intelligence efforts, and increase the jitteriness of U.S. officials.

### **SMD takes too long to develop, undermines international security and causes an arms race the US will inevitably lose**

Hitchens and Samson 4 – Theresa Hitchens, Vice President of the Center for Defense Information, Victoria Samson, research associate for the Center for Defense Information, Summer/Fall 2004, Georgetown Journal, Star Wars Redux, Vol. 5, No. 2, Center for Defense Information, http://www.cdi.org/news/space-security/space-based-interceptors.pdf

A space based missile defense program would drain U.S. financial resources, be years in coming, and in the interim create a hostile environment that would immediately make the United States less secure. Moreover, by opening the door to the weaponization of space, it represents a short-sighted policy that, in the long run would undermine international security as well. The U.S. Congress should put the brakes on current MDA plans, or the United States will be at risk of propelling itself into a new arms race that it cannot win

## AT: China

### China won’t weaponize space- they have been against it for decades

Hui 6 – Zhang Hui, research associate at the Project on Managing the Atom of the Belfer Center for Science and International Affairs at Harvard University’s John F. Kennedy School of Government, Spring 2006, "Space Weaponization and Space Security: A Chinese Perspective," China Security, volume 2, Issue 1, pg 24-36. http://www.wsichina.org/space/focus.cfm?focusid=94&charid=1

In China's view, the most effective way to secure space assets would be to agree on a space weaponization ban. Ambassador Hu stated, "If any country is really worried about possible menace to its space interests, this could certainly be alleviated through the negotiation and conclusion of a treaty on the prevention of space weaponization, as suggested by China… Such a legally binding international treaty will be the best tool to safeguard the interests of all sides."23

China's stance on banning weapons in outer space has been consistent since 1985, when it first introduced a working paper to the U.N. Conference on Disarmament (CD). China's most recent working paper on the issue, introduced in June 2002, emphasizes three basic obligations: (1) Not to place in orbit around the Earth any objects carrying any kind of weapons, not to install such weapons on celestial bodies, and not to station such weapons in outer space in any other manner; (2) Not to resort to the threat or use of force against outer space objects; and (3) Not to assist or encourage other States, groups of States, international organizations to participate in activities prohibited by this Treaty.24

## AT: BMD Scenario

### Boost phase intercept would increase the risk of miscalc and munitions may still land on the US

Hartung et. Al 5 – William D. Hartung, director of the Arms Trade Resource Center at the World Policy Institute, A Profile of the Missile Defense and Space Weapons Lobbies, The World Policy Institute, http://www.worldpolicy.org/projects/arms/reports/tangledweb.html#intro

The APS report further notes the problem of "munitions shortfall." This means that even if the body of the attacking missile is destroyed, the munitions and decoys will continue along a ballistic trajectory, potentially landing either in neighboring countries or even in the United States. The list of additional problems is long. For example, "the intercept locations for ICBM trajectories from North Korea would be over China… Consequently, firing them towards North Korea… could be mistaken for an attack on China, Russia, or other countries."

The boost phase of an ICBM is short, in the range of three to four minutes. As the APS report notes, "In most situations, interceptors would have to be fired within a few seconds after confirmation of a large rocket to intercept it in time to protect the United States." Also, it would be extremely difficult to discriminate between an ICBM launch and a satellite launch, meaning that the boost-phase system would have to be prepared to shoot down any rocket in the vicinity, regardless of its purpose.

### **Weapons have too many logistical challenges—can’t prevent BMD launches**

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

Space-based Lasers for Defense against Ballistic Missiles. Space-based lasers have been proposed for boost-phase ballistic missile defense, potentially both a denied-access and time-sensitive threat. As intercept would occur at a high altitude, the laser beam would not need to penetrate the Earth's atmosphere or to correct for beam broadening from dynamically changing atmospheric conditions. But even given the greater relative susceptibility of booster missiles compared to warheads in their reentry vehicles, the laser system would face many of the obstacles discussed above, including the logistical challenges of launching, orbital storage, and refueling, as well as the launch cost of the needed tons of laser fuel. Boost-phase intercept via SBL was beyond the ten-year horizon of the APS Study Group, so we lack the detailed technical analysis analogous to that provided in their report for space-based interceptors. The 2002 RAND report mentioned earlier, however, provides insight into the requirements and capability of an SBL constellation.n59

Here we examine the number of lasers necessary to defend the United States against a "rogue state" ICBM threat, in this case, four or five missiles launched simultaneously from North Korea. Under highly favorable assumptions, approximately twelve lasers at altitude 3,367 kilometers would be necessary to destroy a cluster of four missiles. n60 Because the constellation would move relative to a fixed point on Earth, its overall missile defense capability would at times be greater -- about six targets. An adversary capable of building ballistic missiles, however, would surely take advantage of the predictable fluctuations of the constellation's capability, choosing the moment of launch to correspond with the lasers' minimum coverage. Figure 1 shows the RAND calculations of this case.

### It’s too costly—can’t take out ICBMs in midcourse

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

It is well established, however, that it would be trivial to destroy the SBIs one by one as the constellation is being built. In contrast to attacks on large, very costly LEO satellites, 1-ton SBI satellites would best be attacked at leisure with a small, low-performance ground-based KKV interceptor, aided by ground-based laser or radar at the planned intercept site. n79 This intercept is feasible now, but the question is one of incentive and resolve: which nation or combination of nations would have sufficient interest to object to and destroy U.S. SBIs, which would be in orbit in violation of no existing law? At the very least, existing international law would require the state responsible for the destruction of SBIs to repay the United States the cost of the SBI and its launch.n80

IN SUM: BALLISTIC MISSILE DEFENSE. Space-based weapons for defense of the United States against long-range ballistic missiles armed with nuclear warheads would be ineffective in the midcourse phase, if the nuclear warheads in antisimulation balloons were accompanied by many indistinguishable balloon decoys. Space-based lasers and space-based interceptors are attractive concepts for boost-phase intercept of long-burn-duration liquid-fueled ICBMs, but entail large costs to offset a few ICBMs that might be launched simultaneously from a small area. The SBL provides a billion-dollar target for a small space mine, while the SBI is vulnerable to space mines or, more specifically, to destruction by low-performance ground-based KKVs as the constellation is being deployed.

Recommendations and Conclusions

Based on the above analysis of three proposed uses of space weapons -- the protection of U.S. satellites, denial of the hostile use of space to adversaries, and global force projection -- we find that the utility of space is limited by three main factors: high cost, considerable susceptibility to countermeasures, and the availability of cheaper, more effective alternatives.

The fourth potential role of space weapons -- boost-phase missile defense implemented by space-based lasers and space-based interceptors -- would in principle be part of a broader program designed to reduce the vulnerability of the United States to nuclear attack. We have noted, however, that states with modest nuclear and missile capabilities have better options than ICBMs carrying nuclear weapons. The deployment of SBLs and SBIs would ultimately provide unique capability against states with large territorial expanse -- Russia and China. But these two states have extensive capabilities in space themselves. The deployment of SBLs would surely be countered by the equally legal deployment of space mines. That would be feasible but less affordable for countering a system of thousands of SBIs, and the question is whether the cheaper and surer destruction of these SBIs one by one in peacetime would be undertaken.

## AT: Ground Laser

### Ground-based lasers are too fast- weapons can’t solve

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SENSOR BLINDING OR DAZZLING. We distinguish "blinding" from "dazzling," using the former for permanent damage and the latter for momentary disabling. Such a threat is not unprecedented; in 1997 the United States tested a low-power laser from White Sands, New Mexico, against an orbiting U.S. Air Force satellite, temporarily blinding it. n25 A similar system located in an adversary's remote or denied-access territory might damage a U.S. surveillance satellite in a matter of seconds, depending on details of the imaging system. Short-pulse lasers can do damage in less than a millionth of a second. As described by Ashton Carter, the destruction of a nonimaging satellite by laser heating is difficult at ranges to geosynchronous earth orbit and could be prevented by modest shields; the sensitive focal plane of an imaging satellite operating at far lower altitudes, however, may suffer damage at laser powers smaller by a factor of 1 million or more.n26

n25. John Donnelly, "Laser of 30 Watts Blinded Satellite 300 Miles High," Defense Week, December 8, 1997, p. 1.

n26. Carter, "Satellites and Anti-Satellites," p. 76.

Physically destroying a ground-based laser site before damage could be done to a U.S. satellite would be nearly impossible, even with space weapons. At the speed of light -- 300,000 kilometers per second (km/s) -- a laser's propagation from Earth to space is essentially instantaneous, although it would take minutes or seconds to aim the laser in addition to whatever "burn time" was necessary for destructive effect once the laser had focused on its target.n27

n27. Atmospheric distortion creates substantial beam spreading of a ground-based laser at orbital altitudes. For instance, at the near-infrared wavelength of 1 mu m, a mirror D = 2 m diameter would produce a spot D[0] = 0.5 m diameter at a distance of 1,000 km in the absence of atmospheric effects. Atmospheric refractive disturbances with a typical scale of r[0] = 15 cm would spread the spot to some D[0](D/r[0]) = 7 m diameter, reducing the heat input to a surface by a factor near 180. Correction of this effect with adaptive optics ("rubber mirrors") is technologically more difficult than the use of adaptive optics in improving the capabilities of ground telescopes to image the heavens. Space-based lasers do not have to contend with beam spread due to atmospheric distortion.

As a defense, airplanes or cruise missiles would take hours or days to act, and intercontinental ballistic missiles, or ICBMs (assuming the needed accuracy could be achieved) up to forty-five minutes. But even a kinetic-energy weapon (such as a long-rod projectile) stationed in orbit would require some tens of minutes to arrive at a suitable orbital position, and five minutes to fall from a typical altitude of 450 kilometers.

## --XT: Heg Sustainable

### US competitiveness will persist in the status quo, even the most pessimistic models prove

Brooks and Wohlforth 8 – Stephen Brooks, Associate Professor of Government at Dartmouth, William C. Wohlforth, Daniel Webster Professor of Government at Dartmouth, “World Out of Balance,” Princeton University Press, http://press.princeton.edu/chapters/i8784.pdf

What accounts for this sudden shift in assessments of American power? For most observers, it was not new information about material capabilities. As Robert Jervis observes, “Measured in any conceivable way, the United States has a greater share of world power than any other country in history.”4 That statement was as accurate when it was written in 2006 as it would have been at any time after 1991, and the primacy it describes will long persist, even if the most pessimistic prognostications about U.S. economic, military, and technological competitiveness come true. For most scholars of international relations,what really changed after 2003 were estimates of the political utility of America’s primacy. Suddenly, scholars were impressed by the fact that material preponderance does not always translate into desired outcomes. For many, theories of international relations (IR) that explain constraints on the use of power were vindicated by American setbacks in Iraq and elsewhere.

### The US is unrivaled in its power and that power will last

Brooks and Wohlforth 8 – Stephen Brooks, Associate Professor of Government at Dartmouth, William C. Wohlforth, Daniel Webster Professor of Government at Dartmouth, “World Out of Balance,” Princeton University Press, http://press.princeton.edu/chapters/i8784.pdf

The purpose of this book is to undertake a systematic evaluation of the external constraints that scholars have highlighted and thereby gain a better understanding of the United States’ global role. This entails answering four questions: Does the United States face the imminent prospect of having its power checked by a balancing coalition of other great powers? As it has become increasingly exposed to the international economy, has the United States become more vulnerable to other actors’ attempts to inﬂuence its security policies? Is the United States tightly bound by the need to maintain a good general reputation for cooperation in international institutions? Does the United States need to adhere to existing rules to sustain legitimacy and thus maintain today’s international institutional order? Our answer to each of these questions is no—a ﬁnding that overturns the scholarly conventional wisdom, according to which these factors strongly constrain U.S. security policy. On the contrary, the unprecedented concentration of power resources in the United States generally renders inoperative the constraining effects of the systemic properties long central to research in international relations. Given the likely longevity of American primacy, this general ﬁnding has important repercussions for thinking about international relations scholarship and U.S. foreign policy. In the concluding chapter, we outline a new research agenda to address the analytical challenge of American primacy, and identify an important and heretofore neglected grand strategic alternative for the United States.

## \*TECH\*

## **1NC Tech F/L**

### Even if US power diminishes, we will still be the preeminent power

Nye 10 – Joseph Nye, Harvard University Distinguished Service Professor, 11-10-10, “the Future of American Power,” http://americanpowerblog.blogspot.com/2010/11/joseph-nye-and-future-of-american-power.html

The twenty-first century began with a very unequal distribution of power resources. With five percent of the world's population, the United States accounted for about a quarter of the world's economic output, was responsible for nearly half of global military expenditures, and had the most extensive cultural and educational soft-power resources. All this is still true, but the future of U.S. power is hotly debated. Many observers have interpreted the 2008 global financial crisis as the beginning of American decline. The National Intelligence Council, for example, has projected that in 2025, "the U.S. will remain the preeminent power, but that American dominance will be much diminished."

### Aerospace industry resilient- financial crisis proves

Deloitte News Report 10, Deloitte is a major international accounting and consulting firm "2009 Global Aerospace & Defense Industry Performance Wrap-up" May 11 www.deloitte.com/view/en\_US/us/industries/Aerospace-Defense-Manufacturing/b28cc9243d188210VgnVCM200000bb42f00aRCRD.htm?id=USRSS

In 2009, the global Aerospace & Defense (A&D) industry experienced a year of mixed financial performance with flat revenues and declining operating margins, against the backdrop of a widespread recessionary environment. While some subsectors ended the decade in better shape than others, challenges for the global industry remain including potential cutbacks in large weapons programs, a transformation in the defense acquisition process, and evolving technological requirements. Still, there are positive signs with orders for new commercial aircrafts, business jets, and innovative technologies expected to drive demand for defense companies.

### Laws of physics and chemistry prevent colonization, innovation can’t solve

Finkel 11 – Alan Finkel, neuroscientist and entrepreneur, and one of the founders of COSMOS, 4-11-11, “Forget space travel: it's just a dream,” COSMOS Online, http://www.cosmosmagazine.com/features/online/4214/the-future-space-travel?page=7

HUMAN EXPANSION across the Solar System is an optimist’s fantasy. Why? Because of the clash of two titans: physics versus chemistry.

In the red corner, the laws of physics argue that an enormous amount of energy is required to send a human payload out of Earth’s gravitational field to its deep space destination and back again.

In the blue corner, the laws of chemistry argue that there is a hard limit to how much energy you can extract from the rocket fuel, and that no amount of ingenuity will change that.

Start with a lightweight payload – a dozen astronauts collectively weighing less than a tonne. Now add the life support systems for a one-year journey, with sufficient food, water, oxygen and an energy source to keep their living quarters warm and bright. Fifty tonnes, perhaps?

Add the rockets and rocket fuel for mid-course corrections, and for landing somewhere interesting then taking off to return to Earth, and the mass spirals to excess.

The laws of physics are immutable. According to these laws, accelerating that large mass and fighting against planetary gravitational fields requires a tremendous amount of energy.

Now consider the laws of chemistry. You can’t change them by legislation. The energy content that can be liberated from rocket fuel, and the propulsion force that can be generated, depend on the mass of the fuel, the molecular bond energies and the temperature at which the chemicals burn.

Scientists and rocket engineers have known this for more than a century and have worked hard to optimise all the parameters. But at the end of the day, there is only so much that you can get out of the rocket fuel - and it's not enough.

### Can’t colonize –environment conditions make it impossible

Deen ‘9

(Munim, Oklahoma Daily writer, “Space Exploration Yields Few Results,” CBS News, <http://www.cbsnews.com/stories/2008/11/19/politics/uwire/main4615911.shtml>, 2/11/09, DA: 7/13/11, Madeline)

By the 1960s, the United States was a bona fide space power, along with Russia. The space race instilled and embodied immense national pride in both nations and wsometimes even global pride among mankind. The 1969 lunar landing was indeed a giant leap for humanity. But what good did it really do? Not that much, honestly. The six NASA moon landings between 1969 and 1972 didnt directly improve anything tangibly. No magic source of perpetual energy was found. The lunar rocks did not yield the cure for the common cold or for any other earthly ailment. There was no breakthrough of any kind on earth that came from the moon landings. To be fair, some of the research and developmental work that went into making the moon landings happen did have some benefit in the real world. However, the most lasting and most recognized example of this has been a pen that can write upside down and under water. Infomercials and magazine ads still tout them as having flown into space . Can you think of anything else useful that we use regularly that came from the moon missions? I cant. The very fact that the moon missions were stopped after 1972 shows that there were little long-term benefits to be had from these missions. After the moon was conquered, attention turned to living in space. With this came the concept of the space station, in which astronauts could live for extended periods of time. Astronauts generally conducted scientific studies during their time up there. Scientific study is always good as long as it produces valid results, positive or negative. However, because of the particular environment of the space station, studies conducted in space are valid only in space. An experiment conducted in zero-gravity conditions produces results that are only applicable in zero-gravity conditions and therefore not valid on Earth. Considering thats pretty much the only place humans can live, the experiments, and therefore the missions, and the space stations themselves, are really of no direct benefit to earthlings. In todays world, there are not just two space powers. Several countries have conducted missions into space. The European Space Agency, Japan, India and China all have built up a long record of space missions. In addition, almost a dozen other smaller national agencies conduct minor space-related operations. Combined, the worlds space agencies have approved budgets of about $50 billion. NASA alone spends about $17 billion annually. While some of these missions involve launching or repairing useful technology such as communications and weather satellites or pertinent atmospheric and weather conditions, the majority of the missions involve scientific experto iments whose results have little bearing on earth because the experiments are conducted in environments that are nothing like earth. Some defend space experiments as being necessary precursors to mans eventual colonization of other planets. I dont buy it. We have yet to find a planet remotely capable of sustaining humanity. Even the vaunted efforts to find evidence of life and water on Mars have come up short. The best evidence of life put forth thus far were fossilized remains of what could be bacteria. Most scientists, particularly bacterial microbiologists, describe this evidence as shaky at best. Mars has no magnetic field. This mens that Martian atmosphere is unable to stop solar wind and radiation from interacting directly with surface soil. This would make life as we know it on Earth impossible. NASAs earliest projections put a manned Mars mission no earlier than 2037. Because of Martian conditions, the mission would essentially be akin to an extended stay on a space station, but with gravity. A fully contained inside and outside on any structure on Mars would be absolutely necessary. That would be true of any attempts to live on Mars, as well. So, in 40 years, astronauts may set foot on another planet. But theyll have to wear spacesuits wherever they go. Their base will have to be artificially maintained to simulate Earth because the planet theyll be on is by most estimates incapable of supporting life. And any attempt to build civilization there will have to start from the ground up. There is nothing there. Imagine the most desolate desert on Earth, make it very cold, take away all the oxygen, and make it impossible to leave without rockets. Thats what Mars is like right now. Even with all of Earths problems, who would seriously want to go to Mars? You cant live there, you cant make a living there, and if something goes wrong, you probably wouldnt be able to leave there in time. Thus, justifying space experiments as leading the way to Martian colonization does not sway me because the entire premise of Martian colonization is flawed. Aside from satellites that actually have some benefit to Earth and humans, what good is space exploration really doing? Its eating up money in the billions while not really yielding anything of solid value. Were in the middle of global recession right now. There are millions of people starving to death on Earth. Millions more barely make a living due to abject poverty. People die of curable diseases every day. Even factoring out the costs associated with maintaining useful satellites, ending space exploration would save billions of dollars that could be used to improve life on Earth. What good was a man taking a step on the moon when millions of malnourished children die before taking their first step on Earth? Instead of throwing money at outer space, lets make use of it on Earth, where it can actually do good for the people who live here.

## **--XT: Competitiveness Sustainable**

### “Competitiveness” is a flawed theory

Krugman 11 – Paul Krugman, Prof @ Princeton and Nobel Prize Winner In Economics, 1-24-11, “The competition Myth,” The New York Times, http://www.nytimes.com/2011/01/24/opinion/24krugman.html?\_r=3&adxnnl=1&adxnnlx=1295895740-k8wCd1lX2ZIyowhgF19//A

Meet the new buzzword, same as the old buzzword. In advance of the State of the Union, President Obama has telegraphed his main theme: competitiveness. The President’s Economic Recovery Advisory Board has been renamed the President’s Council on Jobs and Competitiveness. And in his Saturday radio address, the president declared that “We can out-compete any other nation on Earth.” This may be smart politics. Arguably, Mr. Obama has enlisted an old cliché on behalf of a good cause, as a way to sell a much-needed increase in public investment to a public thoroughly indoctrinated in the view that government spending is a bad thing. But let’s not kid ourselves: talking about “competitiveness” as a goal is fundamentally misleading. At best, it’s a misdiagnosis of our problems. At worst, it could lead to policies based on the false idea that what’s good for corporations is good for America.

## **--XT: Aerospace Resilient**

### No shortage of scientists, their claims are all hype

Teitelbaum 3 - Michael S. Teitelbaum, Program Director at the Alfred P. Sloan Foundation, Fall 2003, “Do we need more scientists,” The Public Interest, http://www.thepublicinterest.com/archives/2003fall/article2.html

The profound irony of many such claims is the disjuncture between practice in the scientific and engineering professions "in which accurate empirical evidence and careful analyses are essential" and that among promoters of "shortage" claims in the public sphere, where the analytical rigor is often, to be kind, quite weak. Few, if any, of the market indicators signaling shortages exist. Strong upward pressure on real wages and low unemployment rates relative to other education-intensive professions are two such indicators conspicuously absent from the contemporary marketplace.

A RAND study released earlier this year assembled the available data from its own research, the NSF, the Census Bureau, the Bureau of Labor Statistics (BLS), the National Research Council (NRC), and several scientific associations. What RAND found largely discredits the case being made for labor shortages. First, RAND noted the obsolescence of the available data, the newest of which refers mostly to 1999 or 2000. RAND called this "especially unfortunate" given that "the [science and engineering] workforce situation has arguably changed significantly" since those heady times of the dot-com, information technology, and telecom booms. But more importantly, RAND's analysis of even data from the boom period showed that "neither earnings patterns nor unemployment patterns indicate [a science and engineering] shortage in the data we were able to find."

### There is a surplus of scientists and engineers

Teitelbaum 3 - Michael S. Teitelbaum, Program Director at the Alfred P. Sloan Foundation, Fall 2003, “Do we need more scientists,” The Public Interest, http://www.thepublicinterest.com/archives/2003fall/article2.html

Still, in most areas of science and engineering at present, the available data show sufficient numbers or even surpluses of highly qualified candidates with extensive postgraduate education. This is especially the case in the academy, which has become risk-averse about replacing departing tenured faculty with tenure-track junior positions. Instead, many universities in the United States have been filling such open slots with temporary and part-time appointees they find in ample pools of highly educated applicants. Indeed, advertisements for a single tenure-track assistant professorship often attract hundreds of applications from recent Ph.D.s. Similar circumstances prevail for engineers and scientists in large sectors of the U.S. economy such as telecommunications, computing, and software, sectors in which lurching market collapses and large bankruptcies have greatly weakened demand for their services.

## --XT: Exploration Impossible

### Deep space exploration impossible- laws of physics and politics make it impossible

Finkel 11 – Alan Finkel, neuroscientist and entrepreneur, and one of the founders of COSMOS, 4-11-11, “Forget space travel: it's just a dream,” COSMOS Online, http://www.cosmosmagazine.com/features/online/4214/the-future-space-travel?page=7

SOMEHOW, THE FACT that this clash of the titans restricts our ability to undertake deep space flights doesn’t feel right. Surely the magic of our success in electronics and information systems should apply?

Moore’s law tells us that every two years the number of transistors in an integrated circuit doubles. Futurologists assure us that the total volume of humanity's knowledge doubles every five years. Why, then, shouldn’t our ability to lift a payload double every five, 10 or even 20 years?

Sadly, the analogy does not apply. In the case of electronics and information systems, we are dealing with soft rules, related to the limits of human ingenuity. In the case of space flight, we are dealing with hard rules, related to the limits of physics and chemistry.

Rocket engineers and scientists have been battling these limits of physics and chemistry for years, with diminishing prospects for further gains.

Add to these hard limits the fear of failure from nervous governments worried about the political backlash if something goes wrong and, no surprise, the added weight for redundant safety and life-support systems makes return trips to other planets utterly impractical.

## --XT: Colonization Impossible

### Many difficulties in moon colonization –lunar nights, solar storms, and cosmic rays pose serious problems

Spotts ‘9

(Peter, Staff writer for Christian Science Monitor, “Mon base: Location, Location, Location,” <http://www.csmonitor.com/Innovation/Tech/2009/0305/moon-base-location-location-location>, 3/6/2009, DA: 7/14/11, Madeline)

If, as planned, the United States eventually establishes a lunar base in 2020, one of the most tempting patches of moonscape is Shackleton Crater at the south pole. There may be water ice for drinking or converting to rocket fuel, the nearly constant sunlight at the rim is ideal for solar power, and the temperature is relatively bearable. But perhaps the most compelling reason is something far more primal: surviving the lunar night, which lasts 14 Earth days and can hit temperatures so cold that oxygen turns to liquid. Amid the many challenges that face America's bid to send four astronauts to inhabit a moon base for 180 days at a stretch, the lunar night is among the hardest to unravel - and for now, scientists think the rim of Shackleton Crater might be the best place to find solutions. "If you want to explore the moon, you have to start with the first requirement: surviving a lunar night," says James Head III, a planetary geologist at Brown University. The goal to return humans to the moon by 2020, first established under President Bush, appears to have President Obama's approval. Between his fiscal 2010 budget proposal and the stimulus package passed by Congress, the National Aeronautics and Space Administration (NASA) is slated to get roughly $2.4 billion more than it received in 2008. The 2010 deadline for retiring the space shuttles remains intact. So does the lunar-exploration program, with its rockets to replace the shuttles. But for all its attractiveness as a steppingstone from Earth to Mars, the moon is one nasty place, explains Narayanan Ramachandran, an aerospace engineer who heads the American Institute of Aeronautics and Astronautics' Space Colonization Technical Committee. The allure of Shackleton Crater is that it is relatively hospitable and practical. Explorers perched on its rim would experience a night of only 2 Earth days and 4 hours. The crater's proximity to the moon's day-night boundary - called the terminator - also makes it an ideal place to test technologies and find out what works and what doesn't in both environments. The difficulties to overcome are many. Solar storms and cosmic rays bombard the daylight half of the moon with charged particles dangerous to humans. Cosmic rays continue the onslaught throughout the night. And the particles smack the lunar surface with enough energy to knock neutrons loose and send them speeding upward - another form of radiation. Lunar dust is another serious problem. On Earth, dust gets tumbled around, rounding its edges, and moisture in the atmosphere makes it easier to clean off. On the moon, however, those processes do not exist, meaning the grains of the surface soil, or regolith, remain jagged. And with no moisture to prevent static electricity from building up on the grains, they provide the ultimate example of static cling - on everything from spacesuits to rover batteries.

### Space colonization brings many health problems

Davis, Fogarty, Richard ‘8

(Jeffery, Jennifer, Space Life Sciences Directorate for NASA, Elizabeth, Wyle Life Sciences, Human health and performance risk management—an approach for exploration missions, 2/6/08, DA: 7/14/11, Madeline)

In addition, terrestrial medical and physiological data may be utilized as appropriate, such as data regarding the loss of bone mass which underlies fracture risk and effective mitigation strategies. Over the past 15 months, NASA conducted reviews of its human research data through the Human Research Program (HRP), a key program in the Exploration Systems Mission Directorate. These data span many disciplines in the HRP such as cardiovascular, musculoskeletal, nutrition, environmental exposures and radiation exposure to name a few.1 These reviews included known historical data from space flight, ground-based simulations such as bed rest, analog environment data such as from over-wintering in Antarctica, and medical operations data. NASA is now developing a regular data review and reporting mechanism to assure that the best available evidence is utilized in this risk management system. There is a need to regularly evaluate the human space flight operations and research evidence base resulting in identification of human health risks and recommendations to develop or modify standards, requirements, procedures, etc.

### Radiation in space causes infertility

Walker ‘11

(James, news writer, “Infertility Concerns May Leave Space Colonization Hopes Barren,” <http://www.gearfuse.com/infertility-concerns-may-leave-space-colonization-hopes-barren/>, 2/14/11, DA: 7/15/11, Madeline)

It’s almost become a type of cliché in science fiction: colonizing Mars and other celestial bodies so that the human race can propagate and populate the galaxy. Unfortunately, according to NASA scientists, reproduction while in space will hamper future colonization and population efforts. According to NASA Ames Chief Life Scientist Tore Straume (seen left with a villainous goatee), the radiation generated by cosmic rays and solar flares will make it difficult to conceive during interplanetary travel. Moreover, any child conceived during spaceflight could become sterilized due to the radiation. This conclusion is based on multiple studies conducted on “non-human primates” (read: “monkeys”) that were given doses of radiation and saw that the eggs of female fetuses began to die off during the second half of pregnancy, resulting in a sterile female when the fetus is finally birthed. Straume says, “

### **Long Space travel not feasible: Major health impacts**

Chavis 10(Jason, Sept 14: Possible Cons of Space Exploration: He is the author of a variety of publications including USA Today: http://www.brighthub.com/science/space/articles/86999.aspx)

Microgravity creates a number of physical effects that can be considered one of the cons of space expeditions. Those astronauts and cosmonauts taking part in missions to low Earth orbit for long durations have been found to suffer from numerous problems. Among the most common effects of a weightless environment include bone density issues, a decline in muscular strength, and issues with aerobic ability. These can lead to higher potentials of injury among the personnel, especially in regards to long term spaceflights. Scientists have also found that weightless environments create a feeling of disorientation, and even basic motion sickness. Upon a return to gravity, astronauts must readjust to its effects. This can be considerably important in regards to potential space travel to other planetary bodies in the Solar System. For example, if NASA attempted a mission to Mars, the personnel would be subject to the weightless environment for a sustained period of time. Upon arrival, they could find themselves with a 25 percent loss in muscle strength as well as possessing fragile bones. An astronaut could take one step out of the landing vehicle and possibly break a leg, creating an emergency that could compromise the mission.

## \*SOLVENCY\*

## 1NC Solvency F/L

### SMD tech is unavailable currently, and even it is, it won’t offer reliable protection, multiple alternatives

Johnson-Freese and Nichols 10 - Joan Johnson-Fresse, chair of the Department of National Security Studies at the Naval War College, Thomas Nichols, Professor of National Security Affairs at the United States Naval War College, “Space, Stability and Nuclear Strategy: Rethinking Missile Defense,” China Security 2010, issue 17, http://www.chinasecurity.us/index.php?option=com\_content&view=article&id=470&Itemid=8

Challenges and risks associated with missile defense come in multiple varieties, but the technical aspects cannot be separated from either the domestic or international ramifications. The time and cost of the science and engineering trials needed to develop missile defense systems are considerable; worse, they are complicated by the existence of cheaper, technically easier countermeasures. Even if the technical challenges could be overcome, missile defense offers very limited protection against weapons of mass destruction—no system will be completely leak-proof. It could also be argued that missile defense research assumes by default that a ballistic missile would be an enemy’s nuclear delivery system of choice rather than, for example, a cargo ship, even though a missile comes with a clear return address and would generate a ghastly response. Still, there is no denying that missile defense advocates have a point that the most recalcitrant proliferators—especially North Korea and Iran—are clearly as determined to develop ballistic delivery vehicles as they are to making the bombs they would carry. But even here, perhaps reflecting a case of the classic war gaming mistake of “defending against what we prefer rather than what the enemy can do,” missile defense advocates focus almost unrelentingly on stopping an incoming warhead aimed at an impact point and discount other missile-borne dangers, such as an electromagnetic pulse (EMP) attack, which would be far easier for a nascent missile-building state to achieve and virtually impossible to stop.

### multiple countermeasures against boost phase intercept

Kleppner and Lamb et. Al 5 - Daniel Kleppner, Lester Wolfe Professor Emeritus of Physics at MIT, Frederick K Lamb, D.Phil. in theoretical physics from Oxford University, 2-16-05, “Report of theAmerican Physical Society Study Group on Boost-Phase Intercept

Systems for National Missile Defense: Scientiﬁc and Technical Issues,” The American Physical Society, http://www.aps.org/about/pressreleases/upload/BPI\_Report.pdf

While boost-phase intercept would not be susceptible to some of the countermeasures to midcourse intercept that have been proposed, there is no reason to think it would not face any countermeasures. Effective countermeasures to boost-phase intercept by interceptor rockets could include launching several ICBMs at nearly the same time or deploying rocket-propelled decoys and jammers. Furthermore, ICBMs could be programmed to fly evasive maneuvers that might overwhelm the agility and guidance and control capabilities of the interceptor or exhaust its propellant. Shortening the boost phase would also be an effective countermeasure: it would be pratically impossible for any interceptor rocket to reach an ICBM with a boost phase of 2 minutes or less, even if it were launched from a very small country. Countermeasures against the Airborne Laser could include applying ablative coatings or rotating the ICBM to reduce the amount of heat themissile absorbs, launching multiple missiles to overwhelm the Airborne Laser's

Capabilities

### Best case scenario for SMD costs 200 billion dollars at a minimum just to launch the system, and would only be able to intercept one missile

Hitchens 4 - Theresa Hitchens, vice president and director of the Space Security Project at the Center for Defense Information, 7-21-04, “Space-Based Missile Defense: Not So Heavenly,” Carnegie Endowment for International Peace, Proliferation Brief Volume 6 Number 13, http://www.carnegieendowment.org/2003/07/24/space-based-missile-defense-not-so-heavenly/b9d

 A recent study by an illustrious panel of physicists begs to differ. Even though they themselves admit to using "extremely optimistic" technical parameters, the American Physical Society (APS) in a July 16 study found that a bare-minimum system would require at least 1,600 missiles. Such a limited system would be able to defend only the continental United States (not including Alaska) and be able to shoot down only one solid-fuel ICBM coming in from North Korea (the sort the Pentagon predicts Pyongyang and other countries are likely to have within 10 to 15 years).

And the U.S. interceptors would have to be substantially larger and faster than ever built before, not to mention larger and faster than currently estimated by MDA. All totaled, the interceptors would weigh 2,000 metric tons.

While the study, "Report of the American Physical Society Study Group on Boost-Phase Intercept Systems for National Missile Defense: Scientific and Technical Issues," did not provide any cost analysis, doing the math is fairly simple. Average launch costs have hovered for decades at about $22,000 per kilogram. A metric ton equals 1,000 kilograms. So, this best-case scenario for space-based missile defenses would cost $44 billion just to get the interceptors into orbit.

Some experts argue that, given the volume of space launches that would be required to boost the system, launch costs could conceivably over time come down to half that per kilogram sum: $11,000. If this is true, then such a system could be put into orbit for only $22 billion.

But here's the rub: The physicists themselves admit that the system described above is based on assumptions that are optimistic enough to border on unrealistic. Under more realistic technical parameters, a system to defend the continental United States against a North Korean launch would involve 3,600 orbiting interceptors, at a cost of either $99 billion, or using the lower launch cost figure, $49.5 billion. However, the study itself notes that even these "more realistic" assumptions are quite optimistic, not only in pushing the edge of what is technically feasible but also in that the space-based system described is one in which every element works perfectly 100 percent of the time --something unheard of in the annuals of U.S. weapons development.

There is more bad news. To cover Alaska, more than double the number of interceptors would be required to defend against a North Korean ICBM, thus more than doubling the cost (more than $198 billion or more than $99 billion).

### BMD solves—they can be upgraded

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

As discussed above, ballistic missiles could provide an affordable (as the United States already possesses a significant surplus), quick-response, and effective near-term alternative to space-based force projection. n72 Although during the Cold War, hundreds of nuclear-armed ICBMs would have been overkill in destroying an entire country, many thousands of nonnuclear warheads might now be required in even a modest war. If, however, one assumes that space weapons are only for exceptional, "leading edge" targets, then a comparable number of ground-based intercontinental force-projection weapons would have greater capability and responsiveness. Note, in particular, that the long flight time of a UCAV does not imply a similarly long response time to targets of opportunity. If there are many targets to be struck, a steady UCAV presence would be maintained, and targets dynamically tasked by data link to the closest UCAV carrying the proper munitions.

Both nuclear and conventional ground-launched ballistic missiles (and cruise missiles) with ranges of 500 to 5,500 kilometers are banned (for only the United States and Russia) by the Intermediate-Range Nuclear Forces Treaty of 1987, limiting potential platforms to ground-launched ICBMs, aircraft, and submarine-launched ballistic missiles of assorted ranges.

If the existing accuracy of ICBMs, approximately 100 meters, is not adequate for precision nonnuclear strike requirements, improvements are possible. Ballistic missiles could be reconfigured to have slower reentry speeds and enhanced terminal guidance systems using GPS or laser designation, improving missile accuracy to the few-meter circular error probable or better achieved by JDAM bombs or cruise missiles. n73 Ballistic missiles could be armed with a variety of munitions, including a solid-tipped penetrator payload used as a kinetic energy weapon (effective against hardened targets and shallow bunkers or tunnels if their locations were precisely known); traditional bombs; or non-lethal payloads such as hardening foam, irritating gas, foul-smelling liquid, or an electronics-disabling electromagnetic pulse weapon.n74

## --XT: SMD Not Feasible

### SMD isn’t feasible, massive launch constraints due to the large number of interceptors that would have to be launched

Kleppner and Lamb et. Al 5 - Daniel Kleppner, Lester Wolfe Professor Emeritus of Physics at MIT, Frederick K Lamb, D.Phil. in theoretical physics from Oxford University, 2-16-05, “Report of theAmerican Physical Society Study Group on Boost-Phase Intercept

Systems for National Missile Defense: Scientiﬁc and Technical Issues,” The American Physical Society, http://www.aps.org/about/pressreleases/upload/BPI\_Report.pdf

 If interceptor rockets were based in space, their coverage would not be constrained by geography, but they would confront the same time constraints and engagement uncertainties as terrestrial-based interceptors. Consequently, their kill vehicles (the final homing stage of the interceptors) would have to be similar in size to those of terrestrial-based interceptors. With the technology we judge could become available within the next 15 years, defending against a single ICBM would require a thousand or more interceptors for a system having the lowest possible mass and providing realistic decision time. Deploying such a system would require at least a five- to tenfold increase over current U.S. space-launch rates

### SMD impractical: time constraints, number of interceptors needed, and launch rates prove

Kleppner and Lamb et. Al 5 - Daniel Kleppner, Lester Wolfe Professor Emeritus of Physics at MIT, Frederick K Lamb, D.Phil. in theoretical physics from Oxford University, 2-16-05, “Report of theAmerican Physical Society Study Group on Boost-Phase Intercept

Systems for National Missile Defense: Scientiﬁc and Technical Issues,” The American Physical Society, http://www.aps.org/about/pressreleases/upload/BPI\_Report.pdf

Boost-phase interceptors fired from orbiting satellites could in principle defend the United States against ICBMs launched from anywhere on Earth. While their coverage would not be constrained by geography, space-based interceptors would have the same time constraints and engagement uncertainties as terrestrial-based interceptors. As a result, their kill vehicles would have to be at least as massive as the kill vehicles of terrestrial-based interceptors. Because a satellite orbiting at low altitude spends so little time over a single spot on Earth, many interceptor-carrying satellites would be needed to defend against even a single missile. The precise number of satellites and the total mass that would have to be placed into orbit would depend on the type of ICBM as well as the speeds, accelerations, and masses of the interceptors and their kill vehicles, which would in turn depend on the technology available. Based on the technology that could, in our judgment, be developed within the next 10 to 15 years, we find that a thousand or more interceptors would be needed for a system having the lowest possible mass and providing a realistic decision time. Even so, the total mass that would have to be orbited would require at least a five- to tenfold increase over current U.S. space-launch rates, making such a system impractical.

## --XT: Too Costly

### SMD costs far more than expected and can only stop one missile, making it wildly impractical

Hitchens 4 - Theresa Hitchens, vice president and director of the Space Security Project at the Center for Defense Information, 7-21-04, “Space-Based Missile Defense: Not So Heavenly,” Carnegie Endowment for International Peace, Proliferation Brief Volume 6 Number 13, http://www.carnegieendowment.org/2003/07/24/space-based-missile-defense-not-so-heavenly/b9d

Some might say that such price-tags are not out of line for a future strategic system, given what the United States has spent on its nuclear arsenal. That may be so. But remember, these figures involve only the direct cost of launching the space-based interceptors. Such interceptors, which according to the study must be much faster and much larger than any to date, would have to be developed and built. More cost. In addition, a complex computerized system to control the interceptors would have to be developed. Yet more cost. Finally, a sophisticated new system of detecting, tracking and targeting ICBM launches and nearly instantaneously providing that data to the orbiting interceptors, would be required. Substantially more cost.

Even more troubling is the fact that the study's more realistic scenarios include assumptions that are forgiving in the extreme. For example, these scenarios include only 30 seconds of time for a decision to fire - the best-case analysis assumed an automatic shot once a potential target was detected. This is highly problematic, in that it is impossible to tell during the early boost-phase whether what just went up was an ICBM or a space-launch vehicle carrying a satellite (or, in the case of China, possibly astronauts). To put it mildly, it seems unlikely that any U.S. commander in chief would be comfortable with automating such a momentous decision.

Furthermore, as noted above, these scenarios all are based on essentially a one-shot (in some cases, two-shots), one-kill architecture. This means there is no margin for error; no redundancy in the system. If North Korea decided to launch two ICBMs (once they get them) at Alaska from nearby launch sites, the U.S. networks postulated by the study would most likely be useless. To be able to target multiple interceptors at each incoming ICBM, however, not only involves even more astronomical costs, but also raises the technical problem of ensuring that the interceptors don't become confused and mistake another of their fellow interceptors for the target.

The APS study, in its generosity, called space-based missile defense "impractical." A more realistic look at the data shows that it is wildly so.

### SMD not cost effective

Kosiak 7 – Steven Kosiak, Vice President, Budget Studies, Center for Strategic and Budgetary Assessments, 10-31-07, Arming the Heavens: A Preliminary Assessment of the Potential Cost and Cost-Effectiveness of Space-Based, Center for Strategic and Budgetary Assessments, http://www.csbaonline.org/wp-content/uploads/2011/02/2007.10.31-Spaced-Based-Weapons.pdf

Based on the best available open-source descriptions of potential SBI and SBL systems—provided by the Congressional Budget Office (CBO), the Department of Defense (DoD), RAND, the American Physical Society (APS), and others—this report estimates that an SBI constellation intended for the boost-phase ballistic missile defense mission would have 20-year lifecycle costs of some $29–290 billion, with the lower-end estimate requiring a technological leap in kill vehicle miniaturization. The technological uncertainty and risk associated with developing an SBL system for this mission is far greater. Indeed, it may be doubtful that, even

absent budgetary constraints, such a system could be developed within the time frame considered in this report. But assuming those hurdles could be overcome eventually, such a system might have costs ranging from $128–196 billion.

Despite these high costs, it appears that neither of these systems would have more than, at best, a very modest capability, even in the absence of countermeasures. In the case of the SBI constellations considered in this report, if the attacker prudently timed and salvo-launched its attack, only a single intercontinental-ballistic missile (ICBM) could be intercepted (assuming, consistent with current Missile Defense Agency doctrine, that two interceptors would be launched against each booster)—even if the technology worked perfectly. The SBL missile defense constellations considered in this report would also likely have only relatively limited capabilities—e.g., the ability to intercept perhaps half a dozen ICBMs in the event of such an attack.

### SMD ineffective

Kosiak 7 – Steven Kosiak, Vice President, Budget Studies, Center for Strategic and Budgetary Assessments, 10-31-07, Arming the Heavens: A Preliminary Assessment of the Potential Cost and Cost-Effectiveness of Space-Based, Center for Strategic and Budgetary Assessments, http://www.csbaonline.org/wp-content/uploads/2011/02/2007.10.31-Spaced-Based-Weapons.pdf

The case for space-based weapons appears to be weakest in the case of the boost-phase ballistic missile defense mission. A constellation of space based weapons designed to defend the United States against an ICBM attack would be extremely costly to acquire and support. Moreover, at least based on the technology likely to be available over the next twenty years, such a system would probably not prove to be a cost-effective investment, especially when measured against the cost to a potential adversary of defeating such a system.

### SMD is expensive, politically unpopular, and easy to counter

**Krepon and Katz-Hyman 5** – Michael Krepon, co-founder of Stimson, and director of the South Asia and Space Security programs, and Michael Katz-Hyman, research associate for the Space SecurityProject of the Henry L. Stimson Center, July 2005, “Space Weapons and Proliferation,” the Nonproliferation Review, Vol. 12, No 2, http://www.stimson.org/images/uploads/research-pdfs/Space\_Weapons\_and\_Proliferation.pdf

Space-based weapons directed at terrestrial targets have long been a concern to Moscow, but the Pentagon’s track record in this regard has been poor. These concepts remain technically challenging, extremely expensive, susceptible to countermeasures, and politically unpopular. If such capabilities were ever fielded, it would be less expensive and simpler for Moscow to trail US space weapons with low-cost ASATs than to engage in an arms race. Another force sizing factor for Moscow is the extent of US deployments of national missile defenses which, while being less technically challenging, expensive, and politically charged than space-based weapons, have also been characterized by cost growth and poor performance. If US national ballistic missile defense flight tests perform better, and if Moscow feels obliged to react, it could further refine countermeasures as a cost-effective alternative to competing in an arms race.

## --XT: SQuo Solves

### **Ground based BMD solves**

DeBlois et al 4--- Bruce DeBlois is Director of Systems Integration at BAE Systems and former Senior Fellow of Science and Technology at CFR, Richard Garwin is IBM Fellow Emeritus at the Research Center of IBM and former Senior Fellow of Science and Technology at CFR, and Scott Kemp is a Fulbright Fellow to the European Union and research staff at the Program on Science and Global Security at Princeton University, Jeremy C. Marwell is a Furman Scholar at the New York University School of Law, Fall 2004, “Space Weapons; Crossing the U.S. Rubicon” International Security, Pg. 50

Space-based interceptors were analyzed in depth by the APS Study Group, whose members included long-time engineering experts on rockets and defenses. The APS group refined existing techniques for bringing the rocket-propelled interceptor's kinetic-kill vehicle into collision with the booster while it is still firing, such that its calculations represent an optimistic picture of the system's capability. Nonetheless, the group found that mass constraints (driven by the cost of putting material in orbit) undermined any inherent advantages the space-based interceptors might have enjoyed in terms of global reach and exo-atmospheric maneuverability.

In sum, the APS study estimates the United States would need some 10,000 tons of material in orbit to deal with the simultaneous launch of five ICBMs from a compact area, and that with only one or sometimes two interceptors per ICBM launch. At $ 22 million per ton of mass launched into LEO, this would amount to some $ 220 billion for launch costs alone.

For boost-phase intercept, the APS analysis demonstrates that small interceptors (of mass 1,300 kilograms) sometimes proposed for sea-based boost-phase intercept (in the case of North Korea) would not be effective. The study does not preclude, however, the effectiveness of ground- and sea-based highspeed interceptors of some 14-ton launch weight. n78 Ten ground-based interceptors could provide the same capability as some 8,000 space-based interceptors to counter a clustered launch of five ICBMs. The main point of the APS analysis in comparing SBI to ground-based interceptors is that presence in orbit provides no utility unless the KKV of the SBI is given similar "reachout" and "divert" capability to that needed for a ground-based interceptor.

## \*\*\*AFF ANSWERS\*\*\*

## AT: Debris DA

### Non-Unique: collisions are already happening

Huebner 10 – Al Huebner, Writer for towardfreedom.com, 4-28-10, “The Politics of Garbage in Outer Space,” towardfreedom.com, http://www.towardfreedom.com/globalism/1939-the-politics-of-garbage-in-outer-space

Some of the junk polluting space is large enough to do catastrophic damage when it collides. the list includes defunct satellites, discarded rockets, even nuclear-rocket cores. In one typical collision, an Iridium commercial satellite weighing more than 1,200 pounds ran into a nonfunctioning Russian satellite weighing nearly a ton, the impact producing two massive debris clouds. In a second collision, French spy satellite Cerise was sent tumbling when the boom that stabilizes it was vaporized in a collision with a ten-year-old chunk of an Ariane rocket. The boom kept the satellite stable, so in its absence Cerise, which has moved out of its orbit, is now functioning like a ship without a rudder.

The US Space Command tracks objects larger than 10 centimeters across, but much smaller objects can do extreme damage. Because relative speeds are so high, a collision with even a small piece of debris could incpatate or destroy a satellite or space vehicle. And small pieces are abundant. Hundreds of thousands of small spheres of liquid metal coolant have leaked from nuclear reator cores. Paint chips, known to cause damage, are also abundant.