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### Advantage 1

Adv 1: Russia

#### Iran nuclearization on the brink

**Newsmax 13** [“Kissinger: US on Brink of Nuclear Crisis with Iran”, 27 Jan 2013]

Former U.S. Secretary of State and Nobel Peace laureate Henry Kissinger is warning that the United States and Israel are very close to facing a crisis with a nuclear-arming Iran.¶ The 89-year-old Kissinger told the World Economic Forum in Davos, Switzerland, that such a crisis — a full-fledged atomic war — would be "a turning point in human history," the BBC reported.¶ "There has emerged in the region, the current and most urgent issue of nuclear proliferation. For 15 years, the permanent members of the United Nations Security Council [UNSC] have declared that a nuclear Iran is unacceptable, but it has been approaching," he said.¶ Urgent: Should Women Be in Combat? Vote Here ¶ "In a few years, people will have to come to a determination of how to react, or the consequences of non-reaction.¶ "I believe this point will be reached in a very foreseeable future," he added.¶ Kissinger called for “serious” negotiations on both sides to avert the crisis. The most important thing, Kissinger said, was for the West to prevent letting things get so bad that Israel is forced to act alone.¶ "Unilateral intervention by Israel would be a desperate last resort, but the Iranians have to understand that if they keep using the negotiations to gain time to complete a nuclear programme then the situation will become extremely dangerous," he said.¶

#### So is Russian cooperation over Iran

**Krever and Calzonetti 13** [“A glimpse into Putin’s mindset”, Feb 5, 2013, Mick Krever & Claire Calzonetti, CNN]

There has been a bit more cooperation between Russia and the West on the Iranian nuclear issue. This week it was announced that there will likely be another round of talks between Iran, the United States, Russia, and others later this month.¶ Peskov praised the announcement, but laid out a caution.¶ “Over-expectations are very dangerous in diplomacy,” he said, but added, “we have to mobilize diplomatic capacity until the last possible opportunity.”¶ President Obama has begun his second term in office with a clearly domestic-focused agenda; how much “diplomatic capacity” between Russia and the United States is mobilized remains to be seen.

#### American influence vis-à-vis Russia’s key to avoiding strikes – if they hold a stronger hand, they’ll shield nuclearization

**Cohen 11** [Ariel, PhD in Russian and Eurasian Studies and International Energy Policy @ Kathryn and Shelby Cullom Davis Institute for International Studies, “Is Russia Becoming Iran’s Diplomatic Godfather?” , November 2, 2011, The Foundry, pg online @ <http://blog.heritage.org/2011/11/02/is-russia-becoming-irans-diplomatic-godfather>]

Moscow has shown yet again that it is determined to protect Iran’s controversial nuclear program. Russia and China have asked Yukiya Amano, the International Atomic Energy Agency’s (IAEA) director general, to stall U.S.-backed plans to publicize information on Iran’s nuclear program. This information is available in a diplomatic note acquired by the Associated Press.¶ As the leaked IAEA document suggests, Moscow and Beijing should not provide international cover to Tehran’s burgeoning nuclear program. Even the Soviets knew better than that.¶ The “reset” policy paradigm between U.S. and Russia continues to struggle. Principal irritants between Washington and Moscow remain intact, making the “reset” a charade. As The Heritage Foundation repeatedly warned, the “reset” program has been a “bet on the wrong horse”—President Dmitry Medvedev, little more than a placeholder for Putin, has deluded Washington with conciliatory rhetoric aimed to build trust in the Kremlin. The now-imminent return of Vladimir Putin as Russia’s president could expose the “reset” for what it is as he toughens Russia’s foreign policy stance, including on Iran. Emphasizing relations with Medvedev was a bad bet.¶ A diplomatic note from Russia and China to Amano reveals serious disagreements between East and West in the U.N. Security Council (UNSC) on handling Iran’s nuclear activities. The U.S., Britain, and France demand that Amano share all the information available, including on Iran’s suspected experiments with nuclear weapon components. They suggest that he reveal the details at the upcoming IAEA Board of Governors meeting in November, which includes representatives from 35 member states.¶ Meanwhile, Russia and China are doing their best to conceal the damning information. Moscow and Beijing issued a joint statement urging Amano to “exercise caution,” warning that making the information public would be “untimely and inappropriate, because that would drive Iranians into the corner, and their willingness to cooperate on the Islamic Republic’s nuclear program may disappear.”¶ Moscow has longstanding trade and diplomatic connections with Iran and thus attempts to pose as the middleman in the six-party nuclear talks that include U.S., China, Russia, Great Britain, France, and Germany (known in the diplomatic lingo as P-5+1, after the Permanent Five members of the UNSC).¶ However, as we wrote last year, the Kremlin was reluctant to make any compromises with the White House on Iran, even when Russia agreed to support the watered-down UNSC sanctions and cancelled the S-300 anti-aircraft missile sale to the ayatollahs. Today as before, Moscow is trying to fly diplomatic cover for Tehran, which is a Russian arms customer and a geopolitical battering ram to pound the U.S. and its allies in the Persian Gulf.¶ Moscow’s efforts to protect Iran from international pressure actively undermine weapons of mass destruction (WMD) nonproliferation efforts, which used to be an area of active cooperation between Russia and the West. Even the USSR refrained from sharing or selling its nuclear “know-how”—with the exception of China in the 1950s—as a part of its nuclear deterrence strategy based on the UNSC P-5 monopoly.¶ That has changed in the last 20 years. Even though last year Russia supported sanctions against Iran and cancelled the deal to sell the S-300 missile complex to Tehran, today the progress is being reversed, to the satisfaction of the Russian military-industrial complex.¶ This course of action by Moscow increases the danger of Iran actually acquiring nuclear weapons. This may prompt Western powers and Israel to launch a preemptive strike on Iran’s nuclear facilities, which would destabilize the entire region and send oil prices skyrocketing.¶ Therefore, the U.S. and its democratic allies should not allow the Kremlin to become a diplomatic godfather for Iran’s dangerous nuclear program. Preventing nuclear proliferation is one of the basic responsibilities of any great state. The USSR’s leaders understood that, and so should the current administration in the Kremlin. If the Obama Administration believes that the “reset” was about cooperation on Iran, now is the time to get frank with our Russian partners, exposing the dangers Iran poses to its neighborhood and the whole world.

#### Strikes cause extinction

**Nazemroaya 11** [Research Associate at the Centre for Research on Globalization, Mahdi, “The Next World War: The “Great Game” and the Threat of Nuclear War,” 1/10, Global Research]

Any attack on Iran will be a joint operation between Israel, the U.S., and NATO. Such an attack will escalate into a major war. The U.S. could attack Iran, but can not win a conventional war. General Yuri Baluyevsky, the former chief of the Russian Armed Forces General Staff and Russian deputy defence minister, even publicly came forward in 2007 to warn that an attack on Iran would be a global disaster and unwinnable for the Pentagon. [97]¶ Such a war against Iran and its allies in the Middle East would lead to the use of nuclear weapons against Iran as the only means to defeat it. Even Saddam Hussein, who during his day once commanded the most powerful Arab state and military force, was aware of this. In July 25, 1990, in a meeting with April C. Glaspie, the U.S. ambassador in Baghdad, Saddam Hussein stated: “But you know you [meaning the U.S.] are not the ones who protected your friends during the war with Iran. I assure you, had the Iranians overrun the region, the American troops would not have stopped them, except by the use of nuclear weapons.” [98]¶ The diabolically unthinkable is no longer a taboo: the use of nuclear weapons once again against another country by the U.S. military. This will be a violation of the NPT and international law. Any nuclear attack on Iran will have major, long-term environmental impacts. A nuclear attack on Iran will also contaminate far-reaching areas that will go far beyond Iran to places such as Europe, Turkey, the Arabian Peninsula, Central Asia, Pakistan, and India.¶ Within the NATO alliance and amongst U.S. allies a consensus has been underway to legitimize and normalize the idea of using nuclear weapons. This consenus aims at paving the way for a nuclear strike against Iran and/or other countries in the future. This groundwork also includes the normalization of Israeli nukes.¶ Towards the end of 2006, Robert Gates stated that Israel has nuclear weapons, which was soon followed by a conveniently-timed slip of the tongue by Ehud Olmert stating that Tel Aviv possessed nuclear weapons. [99] Within this framework, Fumio Kyuma, a former Japanese defence minister, during a speech at Reitaku University in 2007 that followed the statements of Gates and Olmert, tried to publicly legitimize the dropping of atom bombs by the U.S. on Japanese civilians. [100] Because of the massive public outrage in Japanese society, Kyuma was forced to resign his post as defence minister. [101]¶ The Uncertain Road Ahead: Armageddon at Our Doorstep? The March into the Unknown Horizon...¶ According to the *Christian Science Monitor*, Beijing is a barometre on whether Iran will be attacked and it seems unlikely by the acceleration in trade between China and Iran. [102] Still a major war in the Middle East and an even more dangerous global war with the use of nuclear weapons should not be ruled out. The globe is facing a state of worldwide military escalation. What is looming in front of humanity is the possibility of an all-out nuclear war and the extinction of most life on this planet as we know it.

#### Russian plutonium-238 stronghold is decimating American negotiating posture

**Smith 10** [Marcia Smith, editor of Space Policy Online and researcher for CRS for 31 years - has testified to congress, 1/21/2010, "State of space security is unclear," Presentation to the seminar on Space Security Index 2009: The Status of and Future Trends in Space Security, [www.spacepolicyonline.com/LiteratureRetrieve.aspx?ID=111899arn](http://www.spacepolicyonline.com/LiteratureRetrieve.aspx?ID=111899arn)]

I wonder if the U.S. decision to end its ability to launch astronauts into space and rely on Russia for an indefinite number of years will change any of the dynamics in international cooperation and space security generally.¶ Russia has done an impressive job of turning its space program – including human spaceflight – into a money-making enterprise. A year from now, when the space shuttle is retired, Russia will be in the catbird’s seat, able to dictate who goes up to the International Space Station, when, and at what price.¶ The space station partnership has stood the test of time and I certainly don’t want to inject any negativism into it, but one can’t ignore the fact that – according to NASA -- the Russians are taking advantage of the current situation with regard to plutonium-238. Russia has a contract to sell plutonium-238 to the United States for NASA to use in some of its planetary exploration missions, but once Congress rejected a request from the Department of Energy to restart domestic plutonium-238 production, the Russians decided to raise the price, even though a contract already was in place.¶ Right now I believe the price for a seat on Soyuz is $51 million. What will it be once the shuttle is retired?¶ And the issue is more than price. The United States and Russia have been equals in the human space flight arena for decades. Will Russia view the United States differently in international fora when it is just another paying customer? Some people argue that the situation is no different than those years after the Columbia tragedy when we relied on¶ 5¶ Russia to take our astronauts to the station, but I don’t agree. Now we are choosing to walk away from our ability to launch people into space for at least 5-7 years. It’s not an emergency. It’s a deliberate choice.

#### It’s the decisive factor

**Kaufman 8** [Marc, “NASA Wary of Relying on Russia” Washington Post, March 7, 2008, pg online @ <http://www.washingtonpost.com/wp-dyn/content/article/2008/03/06/AR2008030604070.html?sub=AR>]

For five years or more, the United States will be dependent on the technology of others to reach the station, which American taxpayers largely paid for. To complicate things further, the only nation now capable of flying humans to the station is Russia, giving it a strong bargaining position to decide what it wants to charge for the flights at a time when U.S.-Russian relations are becoming increasingly testy.¶ In addition, some fear the price will be paid not only in billions of dollars but also in lost American prestige and lost leverage on the Russians when it comes to issues such as aiding Iran with its nuclear program.¶ NASA Administrator Michael Griffin calls the situation his "greatest regret and greatest concern." For most of the five-year gap, he said, "we will be largely dependent on the Russians, and that is terrible place for the United States to be. I'm worried, and many others are worried."¶ Sen. Bill Nelson (D-Fla.), chairman of the subcommittee that oversees NASA, went further. "This is a very serious betrayal of American interests," he said. "This will be the first time since Sputnik when the United States will not have a significant space superiority. I remain dumbfounded that we've allowed this serious threat to our national security to develop."¶

#### Russian leverage will be used to bolster CSO influence

**Sueldo 11** [“The Reset Needs a New Angle”, Foreign Policy Journal, Alejandro M. Sueldo, scholar with the Project on Nuclear Issues of the Center for Strategic & International Studies (CSIS), September 26, 2011]

As NATO withdraws, many of Moscow’s neighbors will eagerly turn back to the Kremlin for help in stabilizing their restive region and keeping Iran and China in check, but at the price of greater Russian influence. In that regard, the Shanghai Cooperation Organization – which has called on the U.S. to withdraw its military forces from Central Asia – and the Russia-led Collective Security Treaty Organization – and in particular its Collective Rapid Reaction Force which will be used to counter “Arab-revolution”-type upheavals in member countries – are platforms through which Russia solidifies its regional influence and contains threats south of its border.

#### That cements Russian leverage over Central Asia

**Bhadrakumar 9** [“A moment of truth for Obama in Moscow”, 03-Jul-09, M K Bhadrakumar, career diplomat in the Indian Foreign Service]

That is, of course, a vast simplification of Russian policy. Moscow is concerned that Washington is striving to expand NATO's presence in Central Asia. Equally, the US has shut the door firmly on any form of cooperation between NATO on one side and the Russia-led Collective Security Treaty Organization or the SCO on the other. Nor has Washington allowed Moscow to play any significant role in the search for conflict-resolution in Afghanistan. Washington continues to engage the SCO member countries individually on cooperation with regard to Afghanistan. China and Kazakhstan have even been invited to deploy troops.¶ Russia has, in essence, taken the initiative to muzzle its way by creating a trilateral format with Afghanistan and Pakistan. The presidents of the three countries held a joint meeting on the sidelines of the SCO in Yekaterinburg, Russia, last month. A foreign minister level meeting since took place last Friday in Trieste.

#### That military leverage encourages broader Russian adventurism

**Weitz 11** [RUSSIA-US RELATIONS: HYPOTHESES AND RECOMMENDATIONS, Dr. Richard Weitz, Senior Fellow and Director of the Center for Political-Military Analysis at Hudson Institute, 12/12/11, Second Line of Defense]

The United States cannot acknowledge the legitimacy of Russian claims to have a “sphere of influence” in the former Soviet republics. Russian aspirations to affirm its “privileged interests” in the post-Soviet space have been persistent. Putin’s proposal for a Eurasian Union is their latest manifestation. These schemes are unlikely to succeed unless accompanied by Russian economic and military coercion, which the United States should oppose. In their absence, the centrifugal forces in the former Soviet Union are too great, and include the paucity of positive incentives to bind with Moscow and the desire of the local elites for autonomy and options to develop ties with other regions, including Europe, China, and the United States.¶ Russia will not relinquish control of the two separatist regions of Georgia, Abkhazia and South Ossetia, but Moscow might be more open to allowing a greater role for Georgian representation in the two regions as well as a more relaxed regime for people and businesses. The recent Russia-Georgia WTO agreement might provide an opening for exploring expanded links, though major improvements are unlikely to improve until the next generation of leaders assume power in both countries.¶ Russia’s support for the NATO effort in Afghanistan is conditional. Russians naturally prefer that the United States and its allies make the main effort in countering regional terrorist threats. Important Russian groups also earn income by selling fuel and transportation resources to the NATO war effort. If the United States and its allies were ever to stabilize the security situation there, Moscow would likely try to push NATO combat forces out of Afghanistan and Central Asia.¶ Given all the problems with sending NATO supplies to Afghanistan through Pakistan, the United States should try to expand the volume of supplies sent through Northern Distribution Network’s South Caucasus route. Such a move would boost the U.S. regional presence in the South Caucasus and reaffirm the U.S. commitment to these countries as a key partner in this endeavor by strengthening security ties between the United States and these states, which are unlikely to soon receive NATO membership. But expanding NDN South would probably require more U.S. and NATO resources to address logistical and infrastructure bottlenecks.

#### Great power war

**Blank 9** - Dr. Stephen Blank, Research Professor of National Security Affairs at the Strategic Studies Institute of the U.S. Army War College. March 2009. “Russia And Arms Control: Are There Opportunities For The Obama Administration?,” online: http://www.strategicstudiesinstitute.army.mil/pdffiles/pub908.pdf

Proliferators or nuclear states like China and Russia can then deter regional or intercontinental attacks either by denial or by threat of retaliation.168 Given a multipolar world structure with little ideological rivalry among major powers, it is unlikely that they will go to war with each other. Rather, like Russia, they will strive for exclusive hegemony in their own “sphere of influence” and use nuclear instruments towards that end. However, wars may well break out between major powers and weaker “peripheral” states or between peripheral and semiperipheral states given their lack of domestic legitimacy, the absence of the means of crisis prevention, the visible absence of crisis management mechanisms, and their strategic calculation that asymmetric wars might give them the victory or respite they need.169 Simultaneously, The states of periphery and semiperiphery have far more opportunities for political maneuvering. Since war remains a political option, these states may find it convenient to exercise their military power as a means for achieving political objectives. Thus international crises may increase in number. This has two important implications for the use of WMD. First, they may be used deliberately to offer a decisive victory (or in Russia’s case, to achieve “intra-war escalation control”—author170) to the striker, or for defensive purposes when imbalances 67 in military capabilities are significant; and second, crises increase the possibilities of inadvertent or accidental wars involving WMD.171 Obviously nuclear proliferators or states that are expanding their nuclear arsenals like Russia can exercise a great influence upon world politics if they chose to defy the prevailing consensus and use their weapons not as defensive weapons, as has been commonly thought, but as offensive weapons to threaten other states and deter nuclear powers. Their decision to go either for cooperative security and strengthened international military-political norms of action, or for individual national “egotism” will critically affect world politics. For, as Roberts observes, But if they drift away from those efforts [to bring about more cooperative security], the consequences could be profound. At the very least, the effective functioning of inherited mechanisms of world order, such as the special responsibility of the “great powers” in the management of the interstate system, especially problems of armed aggression, under the aegis of collective security, could be significantly impaired. Armed with the ability to defeat an intervention, or impose substantial costs in blood or money on an intervening force or the populaces of the nations marshaling that force, the newly empowered tier could bring an end to collective security operations, undermine the credibility of alliance commitments by the great powers, [undermine guarantees of extended deterrence by them to threatened nations and states] extend alliances of their own, and perhaps make wars of aggression on their neighbors or their own people.172

#### No domestic resurrection of Plutonium-238 production

**Packard 12** [“The US Space Program’s Plutonium-238 Crisis”, January 6th, 2012, Steve Packard, science popularize, engineer, maintainer of skeptical science websites, Depleted Cranium]

The Advanced Test Reactor has been the focus of recent efforts to restart US Pu-238 production. Several bills and proposals to begin production at the site have been floated, but funding has not been provided. Most recently, a funding request for the relatively small amount of fifteen million dollars by the DOE was shot down by Congress. No explanation was given, but it seems no US legislators are interested in restarting plutonoum-238 production, quite possibly because nobody’s spent any money lobbying for it and some have spent money lobbying against it.

#### But even if domestic production is resumed, reactor shortages render it insufficient

**Packard 12** [“The US Space Program’s Plutonium-238 Crisis”, January 6th, 2012, Steve Packard, science popularize, engineer, maintainer of skeptical science websites, Depleted Cranium]

Getting enough Np-237, however, is not the biggest problem that the United States faces in producing Pu-238, however. The US has a shortage of suitable reactors where the neptunium could be irradiated to produce the final plutonium-238 product. Irradiating the targets requires a reactor with a very high neutron flux and the ability to receive materials for irradiation. During the Cold War, the United States operated reactors at the Hanford and Savannah River sites primarily for the production of plutonium for nuclear weapons. These same reactors could be used to irradiate materials for the production of medical and industrial isotopes along with materials like plutonium-238. Therefore, up until the late 1980’s, the US had ample capacity for plutonium-238 production. In the early 1990’s, the United States shut down all such reactors over “proliferation concerns.” Russia, on the other hand, converted theirs to the full time production of peaceful isotopes, which is why they have been the world source for plutonium-238.¶ There are other reactors in the United States that could potentially produce plutonium-238, but not many of them. The US has seen an unfortunate reduction in the number of research and irradiation reactors available. Many, such as the Fast Flux Test Facility were shut down due to “proliferation concerns.” Others like the High Flux Beam Reactor were closed after celebrities lobbied heavily against them. Many simply were closed due to age and have not been replaced, given the lack of construction of new research reactors in the US in recent years.

### Advantage 2

Adv 2: Space Exploration

#### Plutonium-238 supply key to deep space exploration

**Corley 12** [New Scientist, August 11, 2012, “So long, plutonium”, Anne-Marie Corley, Features; No. 1014, lexis]

NASA's most distant probe owes its long life to a warm heart of plutonium-238. A by-product of nuclear weapons production, the material creates heat as it decays and this is converted into electricity to power Voyager's instruments. Engineers expect the craft will continue to beam back measurements for another decade or so, before disappearing into the void.¶ Since the 1960s, this plutonium isotope has played a crucial role in long-haul space missions, mainly in craft travelling too far from the sun to make solar panels practical. The Galileo mission to Jupiter, for instance, and the Pioneer and Voyager probes all relied on it, as does the Cassini orbiter, which has revealed the ethane lakes and icy geysers on Saturn's moons, among other wonders.¶ Yet despite many successes, this kind of mission may soon be a thing of the past. The production of plutonium-238 halted decades ago and the space agency's store is running perilously low. Without fresh supplies, our exploration of the outer solar system could soon come to a grinding halt.

#### Several impacts – first, that’s key to scientific discoveries that sustain the committed exploration and development of space

**IAA 4** [Final Report, “The Next Steps in Exploring Deep Space”, A Cosmic Study By The International Academy of Aeronautics, 9 July 2004]

The early human spaceflight programs, up to and including the Apollo missions to the Moon,¶ made no pretense about being scientifically motivated. They were technologically driven as part¶ of a race between the U.S. and the Soviet Union, and science was a secondary or tertiary¶ consideration at best. When the race was over, the lack of a compelling scientific foundation or¶ a recognizable long-term goal led to a drastic reduction in public interest.¶ In comparison to that of forty years ago, today’s society is remarkably scientifically and¶ technically sophisticated. The explosion of information and communications technologies has¶ placed vast amounts of information at the fingertips of virtually every interested citizen. And¶ while much of the public generally accepts the notion that scientific discovery and exploration¶ are a worthy human imperative, the public also has become more skeptical and more demanding¶ of clear articulation of goals and benefits. An indication of what these goals should be can be¶ found in the continuing intense public interest in discovery-oriented robotic space science¶ programs, such as the Mars Exploration program and the observations of the Hubble Space¶ Telescope. To gain the public’s advocacy, the scientific challenges we undertake should be bold¶ and clear, and should resonate with fundamental human questions. Fortunately, our¶ understanding and capabilities have progressed to the point that we can make meaningful¶ progress toward answering questions that are worthy of public support, such as “Where do we¶ come from? What will happen to us in the future? Are we alone in the Universe?” These very¶ fundamental issues can be recast as scientific goals to be achieved in the course of exploring¶ space. And from these goals we can formulate objectives and investigations, identify¶ destinations, make architectural trades, and develop a compelling integrated plan for robotic and¶ human exploration.

#### Moreover, effective partnerships are key to the political sustainability of space programs

**Slazer 12** [“Perspectives on NASA’s strategic direction”, Frank Slazer, an executive with nearly 30 years of experience on space policy issues and programs, Space Review, September 10, 2012, Vice President of the Space Systems Division of the Aerospace Industries Association.]

International cooperation beyond Earth orbit¶ AIA recognizes the value of international partnerships in space programs, and they have been crucial to NASA’s success. The International Space Station (ISS) demonstrated not only the ability for a multinational partnership to successfully design, build, and operate a complex and sophisticated space system across multiple decades, it showed that the partnerships themselves can help provide programmatic and political sustainability for missions and programs in the long-term.

#### Extinction is inevitable – laundry list – deep-space exploration key to solve

**Poston, 12** \*Ph.D. in Nuclear Engineering from the University of Michigan, leader of the Space Fission Power Team at Los Alamos National Laboratory (LANL)\*

[David Poston, . 16 continuous years of experience in the field of space nuclear power and is currently the nuclear design lead for all LANL space reactor projects. Dr. Poston received a BS in Mechanical Engineering the University of Michigan, an MS in Mechanical Engineering from Stanford University, an MS in Nuclear Engineering from the University of California at Berkeley, and a“Space Nuclear Power: Fission Reactors”, <http://spacenuke.blogspot.com/2012/02/space-fission-power-post-1-we-need-to.html>’]

Viability and Preservation.¶ The all-or-nothing benefit of space exploration is the long-term survival of the human race; although the extended timeframe of this benefit makes it very hard to quantify. We know that our life on Earth is finite, but the preservation benefit of sustained civilization outside of the Earth could range from enormous to miniscule depending on whether viability of human life on Earth ends in <1 thousand years or >1 billion years. There is a long list of potential calamities that could end human civilization, including asteroid/comet, super-virus, excess volcanism, socioeconomic collapse, environmental changes, weapons of mass destruction, or maybe something we’ve never envisioned. Some of these initiating events can be mitigated or prevented as a result of space exploration; most notably the ability to deflect or destroy a potential extinction causing asteroid or comet. The ability to deflect an asteroid could actually be developed within a decade using existing technology, the question is would we have enough warning time to successfully develop and deploy it. Space exploration could also uncover currently unknown threats, such as looming changes in the behavior of the sun, or maybe astronomical threats such as nearby black holes, supernovae, dark matter, or something our current understanding of physics is not aware of. ¶ The ultimate defense against human extinction would be to establish permanent, self-sustaining colonies of humans beyond the Earth. The path to this type of existence does not require a huge leap in science and technology; most engineers agree that abundant, reliable energy (probably nuclear) is the key to expanding into space. In the near term (decades) exploration could focus on where and how to develop sustainable communities away from the earth, including quasi-sustainable outposts on the moon and Mars. In the mid-term (centuries) sustainable outposts could be created on Mars, Titan, asteroids, etc. that could be considered planetary lifeboats, as a safeguard against major calamities that could end human civilization. In the long term (millennia), the concept of the “planetary lifeboat” could transform to a “celestial Mayflower”, taking us to new worlds outside of our solar system. The benefits of this scenario are not limited to merely saving the human race. Even if humanity continues to thrive on Earth, there would be the possibility for a nearly unlimited number of humans to experience existence (in addition to the increased population that Earth could support by importing resources) and expand the extent of human condition (e.g. well-being, knowledge, and enlightenment). If new opportunities and experiences emerge, people will migrate to them, just as they did to the New World ~500 years ago.¶

#### Second, stable long-term space policy key to aerospace industry

**Slazer 12** [“Perspectives on NASA’s strategic direction”, Frank Slazer, an executive with nearly 30 years of experience on space policy issues and programs, Space Review, September 10, 2012, Vice President of the Space Systems Division of the Aerospace Industries Association.]

Our support for NASA and the nation’s space programs is rooted in a fundamental belief that US space programs have been and continue to be a force of good for our nation.¶ As you are aware, the space sector within US industry remains closely affected by US government space programs. In recent years, our nation’s space industrial base has been struggling to adapt to reduced demand by government—especially due to the end of the Space Shuttle program—and downward pressures on DOD, NASA, and NOAA budgets that threaten to exacerbate the risk to the industrial base.¶ AIA believes that any examination of NASA’s strategic direction should include consideration of the health of the US aerospace industrial base to ensure that our national space capabilities for US government and commercial markets remain second to none. By maintaining stability in objectives for NASA programs, and proactively strategizing equitable management of possible fiscal austerity at NASA, the industrial base can be put in a position to succeed for the benefit of our nation’s security, science, and exploration programs.

#### That solves cyberterrorism

Deloitte 12 | (Deloitte is a consulting and financial advisory service, Report Commissioned by the Aerospace Industries Association, " The Aerospace and Defense Industry in the U.S. A financial and economic impact study," March, http://www.aia-aerospace.org/assets/deloitte\_study\_2012.pdf)

The world continues to demonstrate how dangerous it is and how our civilization and way of life can be put in jeopardy quickly. The surprise attacks on Pearl Harbor and the tragic events surrounding the terrorist attacks of 9/11 have shown our nation how vulnerable it can be. Technology innovations and products developed in the aerospace and defense industry have made our nation safer, from sophisticated sensors that can “see” nefarious activities of our adversaries, to the bomb and metal detectors that have become ubiquitous at airports around the world, the industry continues to innovate to produce the necessary defenses used to increase our national security. Recent advances to counter the next generation national security threats include for example, sophisticated software to trace bank transactions of terrorists, advanced listening sensors to eavesdrop on communications of known terrorists, and sophisticated sensors to help discover threats at our airports, borders, and seaports. Of course, the unmanned aerial vehicle (UAV) has been extraordinarily successful in helping to see, then attack if necessary, our adversaries. Lastly, the specter of a potential cyber-attack on our nation’s water, power, transportation or communications infrastructure is cause for alarm, and the industry continues to develop the next generation technologies to address these and future threats.

#### Nuclear war

Fritz 9 | Researcher for International Commission on Nuclear Nonproliferation and Disarmament [Jason, researcher for International Commission on Nuclear Nonproliferation and Disarmament, former Army officer and consultant, and has a master of international relations at Bond University, “Hacking Nuclear Command and Control,” July, <http://www.icnnd.org/latest/research/Jason_Fritz_Hacking_NC2.pdf>]

This paper will analyse the threat of cyber terrorism in regard to nuclear weapons. Specifically, this research will use open source knowledge to identify the structure of nuclear command and control centres, how those structures might be compromised through computer network operations, and how doing so would fit within established cyber terrorists’ capabilities, strategies, and tactics. If access to command and control centres is obtained, terrorists could fake or actually cause one nuclear-armed state to attack another, thus provoking a nuclear response from another nuclear power. This may be an easier alternative for terrorist groups than building or acquiring a nuclear weapon or dirty bomb themselves. This would also act as a force equaliser, and provide terrorists with the asymmetric benefits of high speed, removal of geographical distance, and a relatively low cost. Continuing difficulties in developing computer tracking technologies which could trace the identity of intruders, and difficulties in establishing an internationally agreed upon legal framework to guide responses to computer network operations, point towards an inherent weakness in using computer networks to manage nuclear weaponry. This is particularly relevant to reducing the hair trigger posture of existing nuclear arsenals. All computers which are connected to the internet are susceptible to infiltration and remote control. Computers which operate on a closed network may also be compromised by various hacker methods, such as privilege escalation, roaming notebooks, wireless access points, embedded exploits in software and hardware, and maintenance entry points. For example, e-mail spoofing targeted at individuals who have access to a closed network, could lead to the installation of a virus on an open network. This virus could then be carelessly transported on removable data storage between the open and closed network. Information found on the internet may also reveal how to access these closed networks directly. Efforts by militaries to place increasing reliance on computer networks, including experimental technology such as autonomous systems, and their desire to have multiple launch options, such as nuclear triad capability, enables multiple entry points for terrorists. For example, if a terrestrial command centre is impenetrable, perhaps isolating one nuclear armed submarine would prove an easier task. There is evidence to suggest multiple attempts have been made by hackers to compromise the extremely low radio frequency once used by the US Navy to send nuclear launch approval to submerged submarines. Additionally, the alleged Soviet system known as Perimetr was designed to automatically launch nuclear weapons if it was unable to establish communications with Soviet leadership. This was intended as a retaliatory response in the event that nuclear weapons had decapitated Soviet leadership; however it did not account for the possibility of cyber terrorists blocking communications through computer network operations in an attempt to engage the system. Should a warhead be launched, damage could be further enhanced through additional computer network operations. By using proxies, multi-layered attacks could be engineered. Terrorists could remotely commandeer computers in China and use them to launch a US nuclear attack against Russia. Thus Russia would believe it was under attack from the US and the US would believe China was responsible. Further, emergency response communications could be disrupted, transportation could be shut down, and disinformation, such as misdirection, could be planted, thereby hindering the disaster relief effort and maximizing destruction. Disruptions in communication and the use of disinformation could also be used to provoke uninformed responses. For example, a nuclear strike between India and Pakistan could be coordinated with Distributed Denial of Service attacks against key networks, so they would have further difficulty in identifying what happened and be forced to respond quickly. Terrorists could also knock out communications between these states so they cannot discuss the situation. Alternatively, amidst the confusion of a traditional large-scale terrorist attack, claims of responsibility and declarations of war could be falsified in an attempt to instigate a hasty military response. These false claims could be posted directly on Presidential, military, and government websites. E-mails could also be sent to the media and foreign governments using the IP addresses and e-mail accounts of government officials. A sophisticated and all encompassing combination of traditional terrorism and cyber terrorism could be enough to launch nuclear weapons on its own, without the need for compromising command and control centres directly.

#### Third, Plutonium-238 solves planetary science

**Squyres 12** [Chair of the Planetary Science Decadal Survey, Steering Group STEVEN W. SQUYRES, Cornell University, Chair LAURENCE A. SODERBLOM, U.S. Geological Survey, Vice Chair WENDY M. CALVIN, University of Nevada, Reno DALE CRUIKSHANK, NASA Ames Research Center PASCALE EHRENFREUND, George Washington University G. SCOTT HUBBARD, Stanford University WESLEY T. HUNTRESS, JR., Carnegie Institution of Washington (retired) (until November 2009) MARGARET G. KIVELSON, University of California, Los Angeles B. GENTRY LEE, NASA Jet Propulsion Laboratory JANE LUU, Massachusetts Institute of Technology, Lincoln Laboratory, Vision and Voyages for Planetary Science in the Decade 2013-2022, The National Academies Press, 2012]

Radioisotope Power Systems are necessary for powering spacecraft at large distances from the Sun; in the extreme radiation environment of the inner Galilean satellites; in the low light levels of high martian latitudes, dust storms, and night; for extended operations on the surface of Venus; and during the long lunar night. With some 50 years of technology development and use of 46 such systems on 26 previous and currently flying spacecraft, the technology, safe handling, and utility of these units are not in doubt. Of the more than 3,000 nuclides, plutonium-238 stands out as the safest and easiest to procure isotope for use on robotic spacecraft. This report’s recommended missions cannot be carried out without new plutonium-238 production or com pleted deliveries from Russia. There are no technical alternatives to plutonium-238, and the longer the restart of production is delayed, the more it will cost. The committee is alarmed at the limited availability of plutonium-238 for planetary exploration. Without a restart of domestic production of plutonium-238, it will be impossible for the United States, or any other country, to conduct certain important types of planetary missions after this decade.

#### That solves biosphere destruction

**Squyres 12** [Chair of the Planetary Science Decadal Survey, Steering Group STEVEN W. SQUYRES, Cornell University, Chair LAURENCE A. SODERBLOM, U.S. Geological Survey, Vice Chair WENDY M. CALVIN, University of Nevada, Reno DALE CRUIKSHANK, NASA Ames Research Center PASCALE EHRENFREUND, George Washington University G. SCOTT HUBBARD, Stanford University WESLEY T. HUNTRESS, JR., Carnegie Institution of Washington (retired) (until November 2009) MARGARET G. KIVELSON, University of California, Los Angeles B. GENTRY LEE, NASA Jet Propulsion Laboratory JANE LUU, Massachusetts Institute of Technology, Lincoln Laboratory, Vision and Voyages for Planetary Science in the Decade 2013-2022, The National Academies Press, 2012]

In the past, scientists had only one planet to study in detail. Our Earth, however, the only place where life demonstrably exists and thrives, is a complex interwoven system of atmosphere, hydrosphere, lithosphere, and biosphere. Today, planetary scientists can apply their knowledge to the whole solar system, and to hundreds of worlds around other stars. By investigating planetary properties and processes in different settings, some of them far simpler than Earth, we gain substantial advances in understanding exactly how planets form, how the complex interplay of diverse physical and chemical processes creates the diversity of planetary environments seen in the solar system today, and how interactions between the physical and chemical processes on at least one of those planets led to the creation of conditions favoring the origin and evolution of multifarious forms of life. These basic motivational threads are built on and developed into the three principal science themes of this report—building new worlds, workings of solar systems, and planetary habitats—discussed in Chapter 3. Current understanding of Earth’s surface and climate are constrained by studies of the physical processes operating on other worlds. The destructive role of Chlorofluorocarbons in Earth’s atmosphere was recognized by a scientist studying the chemistry of Venus’s atmosphere. Knowledge of the “greenhouse” effect, a mechanism in the ongoing global warming on Earth, likewise came from studies of Venus. Comparative studies of the atmospheres of Mars, Venus, and Earth yield critical insights into the evolutionary histories of terrestrial planet atmospheres. Similarly, studies of the crater-pocked surface of the Moon led to current understanding of the key role played by impacts in shaping planetary environments. The insights derived from studies of lunar craters led to the realization that destructive impacts have wreaked havoc on Earth in the distant past, and as recently as 100 years ago a devastating blast in Siberia leveled trees over an area the size of metropolitan Washington, D.C. Three recent impacts on Jupiter provide our best laboratory for studying the mechanics of such biosphere-disrupting events. Wind-driven processes that shape Earth’s desert dunes operate on Mars and even on Saturn’s moon Titan.

#### Environmental destruction causes extinction

Coyne and Hoekstra 7 (Jerry and Hopi, \*professor in the Department of Ecology and Evolution at the University of Chicago AND Associate Professor in the Department of Organismic and Evolutionary Biology at Harvard University, New Republic, “The Greatest Dying,” 9/24, http://www.truthout.org/article/jerry-coyne-and-hopi-e-hoekstra-the-greatest-dying)

But it isn't just the destruction of the rainforests that should trouble us. Healthy ecosystems the world over provide hidden services like waste disposal, nutrient cycling, soil formation, water purification, and oxygen production. Such services are best rendered by ecosystems that are diverse. Yet, through both intention and accident, humans have introduced exotic species that turn biodiversity into monoculture. Fast-growing zebra mussels, for example, have outcompeted more than 15 species of native mussels in North America's Great Lakes and have damaged harbors and water-treatment plants. Native prairies are becoming dominated by single species (often genetically homogenous) of corn or wheat. Thanks to these developments, soils will erode and become unproductive - which, along with temperature change, will diminish agricultural yields. Meanwhile, with increased pollution and runoff, as well as reduced forest cover, ecosystems will no longer be able to purify water; and a shortage of clean water spells disaster. In many ways, oceans are the most vulnerable areas of all. As overfishing eliminates major predators, while polluted and warming waters kill off phytoplankton, the intricate aquatic food web could collapse from both sides. Fish, on which so many humans depend, will be a fond memory. As phytoplankton vanish, so does the ability of the oceans to absorb carbon dioxide and produce oxygen. (Half of the oxygen we breathe is made by phytoplankton, with the rest coming from land plants.) Species extinction is also imperiling coral reefs - a major problem since these reefs have far more than recreational value: They provide tremendous amounts of food for human populations and buffer coastlines against erosion. In fact, the global value of "hidden" services provided by ecosystems - those services, like waste disposal, that aren't bought and sold in the marketplace - has been estimated to be as much as $50 trillion per year, roughly equal to the gross domestic product of all countries combined. And that doesn't include tangible goods like fish and timber. Life as we know it would be impossible if ecosystems collapsed. Yet that is where we're heading if species extinction continues at its current pace. Extinction also has a huge impact on medicine. Who really cares if, say, a worm in the remote swamps of French Guiana goes extinct? Well, those who suffer from cardiovascular disease. The recent discovery of a rare South American leech has led to the isolation of a powerful enzyme that, unlike other anticoagulants, not only prevents blood from clotting but also dissolves existing clots. And it's not just this one species of worm: Its wriggly relatives have evolved other biomedically valuable proteins, including antistatin (a potential anticancer agent), decorsin and ornatin (platelet aggregation inhibitors), and hirudin (another anticoagulant). Plants, too, are pharmaceutical gold mines. The bark of trees, for example, has given us quinine (the first cure for malaria), taxol (a drug highly effective against ovarian and breast cancer), and aspirin. More than a quarter of the medicines on our pharmacy shelves were originally derived from plants. The sap of the Madagascar periwinkle contains more than 70 useful alkaloids, including vincristine, a powerful anticancer drug that saved the life of one of our friends. Of the roughly 250,000 plant species on Earth, fewer than 5 percent have been screened for pharmaceutical properties. Who knows what life-saving drugs remain to be discovered? Given current extinction rates, it's estimated that we're losing one valuable drug every two years. Our arguments so far have tacitly assumed that species are worth saving only in proportion to their economic value and their effects on our quality of life, an attitude that is strongly ingrained, especially in Americans. That is why conservationists always base their case on an economic calculus. But we biologists know in our hearts that there are deeper and equally compelling reasons to worry about the loss of biodiversity: namely, simple morality and intellectual values that transcend pecuniary interests. What, for example, gives us the right to destroy other creatures? And what could be more thrilling than looking around us, seeing that we are surrounded by our evolutionary cousins, and realizing that we all got here by the same simple process of natural selection? To biologists, and potentially everyone else, apprehending the genetic kinship and common origin of all species is a spiritual experience - not necessarily religious, but spiritual nonetheless, for it stirs the soul. But, whether or not one is moved by such concerns, it is certain that our future is bleak if we do nothing to stem this sixth extinction. We are creating a world in which exotic diseases flourish but natural medicinal cures are lost; a world in which carbon waste accumulates while food sources dwindle; a world of sweltering heat, failing crops, and impure water. In the end, we must accept the possibility that we ourselves are not immune to extinction. Or, if we survive, perhaps only a few of us will remain, scratching out a grubby existence on a devastated planet. Global warming will seem like a secondary problem when humanity finally faces the consequences of what we have done to nature: not just another Great Dying, but perhaps the greatest dying of them all.

#### Pu-238 is key – only practical isotope

**Hoover and McNutt 9** [co-chairs of the Radioisotope Power Systems Committee, William H., US Air Force, Ralph L., Applied Physics Laboratory at John Hopkins, DOUGLAS M. ALLEN, Schafer Corporation SAMIM ANGHAIE, University of Florida, Gainesville RETA F. BEEBE, New Mexico State University WARREN W. BUCK, University of Washington, Bothell BEVERLY A. COOK, Jet Propulsion Laboratory SERGIO B. GUARRO, The Aerospace Corporation ROGER D. LAUNIUS, Smithsonian Institution FRANK B. McDONALD, University of Maryland, College Park ALAN R. NEWHOUSE, Independent Consultant, Hollywood, Maryland JOSEPH A. SHOLTIS, JR., Sholtis Engineering and Safety Consulting SPENCER R. TITLEY, University of Arizona, Tucson EMANUEL TWARD, Northrop Grumman Space Technology Radioisotope Power Systems: An Imperative for Maintaining U.S. Leadership in Space Exploration, National Academies Press, 2009]

For nearly 50 years, the United States has led the world in the scientific exploration of space. U.S. spacecraft have circled Earth, landed on the Moon and Mars, orbited Jupiter and Saturn, and traveled beyond the orbit of Pluto and out of the ecliptic. These spacecraft have sent back to Earth images and data that have greatly expanded human knowledge, though many important questions remain unanswered. Spacecraft require electrical energy. This energy must be available in the outer reaches of the solar system where sunlight is very faint. It must be available through lunar nights that last for 14 days, through long periods of dark and cold at the higher latitudes on Mars, and in high-radiation fields such as those around Jupiter. Radioisotope power systems (RPSs) are the only available power source that can operate unconstrained in these environments for the long periods of time needed to accomplish many missions, and plutonium-238 (238Pu) is the only practical isotope for fueling them. The success of historic missions such as Viking and Voyager, and more recent missions such as Cassini and New Horizons, clearly show that RPSs—and an assured supply of 238Pu—have been, are now, and will continue to be essential to the U.S. space science and exploration program. Multi-Mission Radioisotope Thermoelectric Generators (MMRTGs) are the only RPS currently available. MMRTGs convert the thermal energy that is released by the natural radioactive decay of 238Pu to electricity using thermocouples. This is a proven, highly reliable technology with no moving parts.

### Advantage 3

Advantage Three is ESA

#### Congressional acquisition of European Pu-238 cements cooperation between NASA and the European Space Agency

**O’Neill 10** [Ph.D in Solar Physics and an M.Phys in Astrophysics, space science producer for Discovery News, “As NASA's Plutonium Supply Dwindles, ESA Eyes Nuclear Energy Program”, JUL 9, 2010, Discovery, IAN O'NEILL]

NASA is running low on plutonium, an issue that is causing growing concern for future outer solar system missions. And now, the European Space Agency (ESA) has recognized the US space agency’s problems in acquiring the fuel, announcing Europe has plans to start their own production to support joint NASA-ESA programs.¶ GALLERY: Best Space Probe Photographers of the Decade¶ The isotope plutonium-238 (or Pu-238) produces a steady supply of heat that can be readily converted into electricity. Small pellets of Pu-238 (like the one shown above) are commonly found inside radioisotope thermoelectric generators (RTGs) — the power source of spacecraft that explore space beyond the orbit of Mars. At these distances, the sun’s energy is too weak to be a viable energy source for spacecraft, forcing space agencies to use the plutonium isotope.¶ Deep space missions such as the 1970′s Pioneer and Voyager probes were all launched with RTGs attached — Voyager 2 is still transmitting scientific data after three decades in space, proving the longevity of this energy resource. The Cassini Equinox and New Horizons missions are also equipped with RTGs, and next year’s NASA Mars Science Laboratory will use Pu-238 to provide a 24/7 energy resource.¶ SLIDE SHOW: Top 10 Countries on Nuclear Power¶ Alas, although Pu-238 isn’t fissile (i.e. it can’t be used to make a bomb, unlike its slightly larger isotope cousin, Pu-239), it is still radioactive and has very tight regulations surrounding its acquisition and production. Unfortunately, NASA’s stockpile is running low.¶ The US Department of Energy no longer has the funding to restart Pu-238 production and due to a contract dispute, NASA cannot acquire it from Russia. This means that NASA now lacks the plutonium to contribute toward a planned $4.5 billion joint U.S.-Europe flagship mission to the Jovian moon Europa.¶ “If we close another deal with the Russians for another delivery of plutonium-238, or get domestic production restarted, there’s sufficient plutonium well out past the Outer Planets Flagship Mission,” said Jim Adams, deputy director of NASA’s planetary science division.¶ The Russian government also has dwindling supplies after halting production of Pu-278, so they are pursuing a more lucrative contract with NASA — the cause of the dispute.¶ GALLERY: Missions Possible: Top 5 Explorer Spacecraft¶ If Congress denies domestic production and the Russian deadlock continues, there appears to be only one answer to the plutonium deficit: ESA.¶ “To see see ourselves as a serious planetary science partner on the world stage with the United States, we’re building up our nuclear capability for European-built RTGs,” David Southwood, ESA’s director of science and robotic exploration, said in an interview with Spaceflight Now. “We are building for a pretty major capability being available in Europe in the 2020s.”¶ Southwood also hinted that Pu-238 isn’t necessarily the only fuel that can be used with RTGs.

#### The plan creates sustainable space cooperation –

#### First – Codependence is fostered by America’s sustained need for Pu-238 – that inspires continued cooperation

**Lawler 9** [Science, 27 March 2009, Vol. 323 no. 5922 pp. 1666-1667, “Can a Shotgun Wedding Help NASA And ESA Explore the Red Planet?”, Andrew Lawler]

Lean on me¶ NASA has long ruled the roost on solar system missions beyond Earth orbit, having a 3-decade-long track record of landing robots on Mars. But these days it needs a shoulder to lean on. Technical troubles and a $400 million cost increase for MSL recently forced Weiler to postpone the launch of the 900-kg rover by 2 years (Science, 12 December 2008, p. 1618). The overrun will eat into future Mars projects, endangering the agency's decade-old plan to send a probe to Mars every 2 years.¶ Now NASA has decreed that future Mars missions must fit into the more constrained budget. The U.S. agency still plans to send an orbiter to Mars in 2016. One of the scientific instruments aboard the Mars Science Orbiter (MSO) would monitor trace gases such as methane while cameras would provide data on future landing sites. In addition, a communications package would beam information from future U.S. and ESA landers back to Earth.¶ However, overruns on MSL have left NASA managers with only $700 million for the mission, far less than needed. NASA has also pledged to fund two U.S.-built ExoMars instruments, and the $50 million growth in the initial $80 million budget for them would come out of the 2016 mission. To fit a mission into that amount of money, NASA has proposed limiting the number of instruments. But planetary scientists say the current MSO budget is unrealistic. “What can you do with $500 million?” asks John Mustard, a planetary scientist at Brown University and chair of NASA's Mars advisory panel. “Not much.”¶ Given the dire budget situation, U.S. scientists seem to agree that cooperation with ESA is vital. But exactly how that will be done remains unclear. Some engineers and scientists favor a combined 2016 mission in which a U.S., European, or Russian rocket launches a NASA orbiter to Mars, which then drops ExoMars to the surface. In 2018, the two agencies would switch roles, with an ESA orbiter dropping NASA's proposed $1.3 billion to $1.6 billion Mars Prospector Rover. A network of landers designed to monitor Mars's geophysical health could follow in 2020. The first portion of a sample return mission would leave Earth in 2022, with the second half following in 2024. NASA would likely be responsible for getting the Mars sample into orbit, with an ESA craft bringing the sample home to Earth 2 years later.

#### Second – US-EU key to global coop standards

**Robinson 11** [Jana Robinson, European Space Policy Institute, 10/13/11, Space security through the transatlantic partnership, Space Policy 28.1]

Beyond the two traditional space powers, the United States and Russia, Europe and other new actors (particularly China) have changed the geostrategic setting in space and will shape space policies, and associated national policy decision making, for the 21st century. Several conference participants noted that space is not a sanctuary. It is borderless, with predictable orbital paths and assets that are vulnerable. Although nations will differ in what is viewed as an appropriate response to an incident or conflict, there is a need to forge a common understanding of space security “red lines” of acceptable behaviour. Space assets (including ground-based) are properly regarded as critical infrastructure and their disruption or damage would result in far-reaching economic, political, and geostrategic consequences. As space has become more congested, contested and competitive, a number of speakers indicated that there was a desire to strengthen diplomatic channels and promote measures to enhance stability, including best practice guidelines, prior notifications of launches of space vehicles, and closer coordination (including joint ventures). With the increasing presence in space of private operators, it is vital to integrate them into international space security initiatives and dialogues. There was also a general view that organizations such as NATO need to determine their role in the future architecture of space security.¶ 1.2. Transatlantic approaches to international space security cooperation¶ Several participants observed that the transatlantic partnership in the field of space security is only now developing. The EU is a new actor in this field and is interested in pursuing enhanced international cooperation. In this connection, the United States wishes to see the EU, and relevant European institutions and member states, as global players with substantial influence. Recommended preconditions to implementing meaningful transatlantic cooperation on space security are firm political leadership, shared interests, realistic milestones, technological capabilities, and trust in handling sensitive data and information. By establishing its own brand of diplomacy, Europe could also contribute indirectly to US space diplomacy, for example, by bringing actors like China and Russia into the transatlantic dialogue. Japan could play a similar recruiting role among Asian spacefaring nations and aspirants. In terms of global space diplomacy, the draft Code of Conduct for Outer Space Activities introduced by the EU represents the leading collective action to date for the protection of the space environment. It is a document which encourages responsible behaviour in space on a voluntary basis. There was general agreement that the Code is neither intended, nor well-suited, to resolve conflicts in space. In addition to the Code, Europe, the United States and Japan should stake out mutual positions concerning the Group of Government Experts on Outer Space TCBMs in 2012 and the UN Committee on the Peaceful Uses of Outer Space (COPUOS) working group on long-term sustainability.¶ 1.3. Governance of space activities¶ There was broad agreement that, beyond the provisions of the Outer Space Treaty (OST), there exists an increasing demand for new norms, rules, and soft law. Space governance involves strategy, a budgetary framework, development of infrastructure, and regulatory requirements. Challenges to space security need to be publicly debated using various platforms. The COPUOS is the most comprehensive policy forum to seek modalities to increase the stability and sustainability of space activities. It is a venue that involves space experts and deals with practical issues (unlike the Conference on Disarmament, which deals with arms control and where discussion is highly ideological). Outside the COPUOS, the draft Code mentioned above constitutes a first step toward creating political, rather than legal pressure. The theory is that understanding what constitutes responsible behaviour increases strategic stability. It was acknowledged that nations should develop their own “best practice” policies and procedures, including effective enforcement measures. In this connection, private sector initiatives, including the Space Data Association (SDA), should be incorporated into space policy decision making. To improve governance, better coordination between governments and private operators, as well as the pursuit of bilateral agreements, were among the steps discussed. The involvement of emerging space powers (e.g. China, India, Australia, Brazil, etc.) in space governance deliberations is likewise deemed desirable.¶ 1.4. Security policy dimensions of Space Situational Awareness¶ Space Situational Awareness (SSA) is regarded as a lynchpin capability for ensuring the safety and security of satellites and spacecraft and enabling the monitoring and understanding of a constantly changing space environment. SSA is not an end in itself, but a method for safeguarding national security assets and sovereignty. The USA has the world’s most comprehensive SSA capability and Europe is seeking to develop an autonomous capability. Incorporating NATO as a player in a transatlantic SSA configuration seems to some an appropriate move. SSA is also a highly useful diplomatic tool and the sharing of SSA data constitutes one of the most potent, globally available space transparency measures. It likewise contributes to managing the pressing issue of orbital space debris. Coordination and shared input are essential to improving the future upgrading of SSA tools and possibilities for interoperability. The involvement of the private sector and intergovernmental institutions in any global SSA effort is essential. In short, it is important to strengthen collective capability to face new challenges such as flying formations (clusters) of small satellites.¶ 1.5. Transatlantic space crisis management for the future¶ Crisis management is complex and necessitates an understanding of the type of crisis (man-made or natural), the assets involved (their size and purpose), the nature of the crisis (isolated or occurring among several assets) and the global geopolitical environment. The primary objective of space crisis management is to avoid conflicts or disruptive “incidents” in space. The growing dependency on space assets has revealed weaknesses in dealing with space emergencies. There are at least three activities that can be pursued in peacetime: promoting the responsible use of space; deterring attacks or purposeful disruptions; and the building of international partnerships. A robust space crisis management posture can also reduce the possibility of terrestrial conflict. Part of crisis management is considering vulnerability, redundancy, and ability to reconstitute, not only for military, but also civilian assets. Crisis management also involves detailed operational aspects. The Shriever wargames, for example, facilitate the testing of how technologies and different groups may interact in crisis circumstances. Cooperation in crisis management among governments, and governments and private operators, requires joint standards and exercises. The goal is to make reacting to many space-related contingencies a routine exercise.¶ 2. Current outlook¶ There is now a widespread recognition of global dependency on space systems accompanied by a desire for maximum autonomy in a number of areas. Collaboration in space is viewed as the only sustainable path forward. A strong transatlantic partnership, together with Japan, is a key engine that can build on shared values and security interests. This like-minded alliance group can serve as the template for global cooperation and set meaningful standards. Virtually all spacefaring nations desire to mitigate orbital debris, secure free access to space and avoid misunderstandings, mishaps, and misperceptions. Given the complex space environment involving new actors and technologies, there is a need for more creative transparency and confidence-building measures (TCBMs), especially since no new viable space treaty has been proposed. The concept of Space Traffic Management (STM) also warrants further examination.

#### Third – reversing asymmetry in US-EU relations causes EU space situational awareness

**Nardon 7** [Laurence, Senior Research Fellow and the Head of the Space Policy Program at Ifri. She teaches at the Institut d'études politiques of Paris, “Space Situational Awareness and International Policy” October 2007]

Lack of SSA means has often left European countries in the dark. For instance, in 1996, the French experimental satellite Cerise was hit by a piece of debris from an Ariane 4 rocket that had been launched ten years earlier. A British radar first noticed the hit that was later confirmed by U.S. SSA means. France never had a chance to check the information independently. Since then, France has developed a radar system called Graves (Grand Réseau Adapté à la Veille Spatiale, i.e. large network adapted to space monitoring). It is a demonstrator owned by the French Air Force and operational since 2005. Graves can watch the sky up to 1,000 km above the French territory. It is rumored that Graves did witness the Chinese asat test of January 2007. Specifically, Graves could have seen a missile closing in on the Chinese meteorology satellite and, at the next pass, a cloud of debris where the satellite used to be10.

Along with other European radar and telescope systems, Graves may constitute the basis for future European SSA. Acquisition of independent means has always meant a lot for the European space effort. After Ariane and Galileo, SSA seems the logical evolution today. Self-standing SSA means would certainly alter the transatlantic relationship by modifying defense attitudes in Europe. Experts claim SSA would provide European countries with a capacity of space deterrence. The French High Council for Defense (Conseil Supérieur de Défense, CSD) declares that extended space surveillance capabilities would allow France to know in real time what or who has attacked one of its satellites, let the attacking country know that it has been found out and adopt retaliatory measures. CSD assumes this would deter such attacks in the first place.11 This in turn would allow France to forgo deployment of further weapons in space. Also, SSA would give Europeans independent means to verify compliance to an international Code of Conduct for Space, should such a text be adopted in 7 NASA’s Jet Propulsion Laboratory and Goddard Space Flight Center maintain ephemeris of Near Earth Objects (NEO) as well as solar system bodies. They rely partly on data from the Satellite Surveillance System. Indeed CSD proposes that France extends its current limited LEO (Low Earth Orbit) surveillance means to GEO (GEosynchronous Orbit).

Europe is a major space power, but remains far behind the U.S.: cooperation ventures between NASA and ESA are fairly asymmetric; European military space developments are limited. Acquisition of independent space surveillance means would change the situation. However, all European countries do not share the same motivation for space or indeed for military independence.

#### Process key – successful collaborative framework causes SSA

**Rose 11** [Frank A. Deputy Assistant Secretary, Bureau of Arms Control, Verification and Compliance 11-17-11 “USSTRATCOM Cyber and Space Symposium”]

I spoke last year, the focus was on the President’s new National Space Policy, which has a greater emphasis than ever before on the role diplomacy can and should play in space, and on the need for U.S. leadership. Last month, Secretary Clinton gave a speech on American global leadership where she said, “In such a complex world, it is no longer enough to be strong. You also have to be smart and persuasive. The test of our leadership going forward will be our ability to mobilize disparate people and nations to work together to solve common problems, and advance shared values and aspirations.” While these remarks were on U.S. foreign policy in general, they apply remarkably well to U.S. space policy. The world is increasingly interconnected through, and increasingly dependent on, space systems. Our prosperity and security rely on communication, navigation, financial activities, and scores of other activities that depend on information derived from space systems. The space environment, with its challenges of natural and man-made threats, is as complex as the world Secretary Clinton described. This complexity means that all nations must work together to adopt approaches for responsible behavior in space, and the United States, with our history of leadership in space, must lead the pursuit of potential solutions to these shared challenges. Certainly no one in this audience needs to be reminded of the congested and contested nature of space, nor of the President’s goals for expanding international cooperation, strengthening stability in space, and increasing assurance and resilience of mission-essential functions. However, some of you may not be familiar with the active leadership role and responsibilities the State Department and diplomacy have in addressing the President’s goals. One issue that underlines the need for international cooperation and diplomacy is the growing presence of debris in space. There are now approximately 21,000 pieces of trackable debris 10 centimeters or larger in various Earth orbits – about 6,000 metric tons of debris orbiting the Earth. While some pieces of debris are simply “dead” satellites or spent booster upper stages still orbiting, and others are the results of accidents or mishaps, such as the 2009 Cosmos-Iridium collision, some debris is the result of intentionally destructive events, such as China’s test in space of an anti-satellite weapon in 2007. Experts warn that the quantity and density of man-made debris significantly increase the odds of future damaging collisions. To address the growing problem of orbital debris, the United States, through the State Department, has expanded its engagement within the United Nations and with other governments and non-governmental organizations. We are continuing to lead the development and adoption of international standards to minimize debris, building upon the foundation of the U.N. Space Debris Mitigation Guidelines. We are also working to develop international and industry standards to slow down the accumulation of debris in space, and to develop and implement international “best practices” of responsible behavior in space that will put us all on a more sustainable path. International cooperation is also necessary to ensure that we have robust situational awareness of the space environment. No one knows better than U.S. Strategic Command that even with the best technology and expertise available, no one nation has the resources to precisely track every space object. The U.S. National Space Policy implicitly recognizes this fact and thus directs us to collaborate with foreign governments, the private sector, and other organizations to improve our space situational awareness. One example of our efforts to cooperate internationally in the area of space situational awareness is our collaboration with Europe as it develops its own space situational awareness, or SSA system. The Department of State, in close collaboration with the Department of Defense, is currently engaged in policy and technical exchanges with regional and international organizations such as the European Union and the European Space Agency, as well as the governments of individual European allies. These discussions are considering approaches to protect our shared security interests as well as measures to ensure interoperability between our current and planned SSA architectures. Looking ahead, we also see opportunities for cooperation on SSA with our allies and partners in the Asia-Pacific and other regions. International cooperation is also essential to prevent future collisions through the sharing of information with other space-faring nations and our industry partners. As a result, we are seeking to improve our ability to share information with other space-faring nations as well as with our industry partners. The National Space Policy calls for international collaboration on the dissemination of orbital tracking information, including predictions of potentially hazardous conjunctions between orbiting objects. Such collaboration has the benefit of not only preserving the sustainability of space through the prevention of collisions, but improving our own capabilities to conduct expanded space object detection, characterization, and tracking and maintaining the space object catalogue. In coordination with U.S. Strategic Command, the Department of State is working to facilitate the rapid notification of space hazards via Conjunction Summary Messages by reaching out to all space-faring nations to ensure that the Joint Space Operations Center has reliable contact information for transmitting timely notification messages to both government and private sector satellite operations centers. The assurance and resilience of mission-essential functions also benefits from international collaboration. Led by the Department of State, Critical Infrastructure Protection workshops between the United States and the EU seek to identify trans-Atlantic interdependencies, vulnerabilities, and risk-mitigation strategies. The goal of these workshops is to increase the assurance and resilience of mission-essential functions that are enabled by commercial and civil spacecraft and supporting infrastructures against disruption, degradation, and destruction, whether from environmental, mechanical, electronic, or hostile causes. These workshops include the participation of U.S. Strategic Command, which is the lead within the Department of Defense for the protection of defense space critical infrastructures as well as the USG’s responses to purposeful interference against U.S. space interests.

#### **Enhanced surveillance capability for SSA bolsters deterrence through cooperation- data sharing reduces the risk of attack**

Schwartz 10- Chief of Staff of the US Air Force. The senior uniformed Air Force officer responsible for the organization, training and equipping of 680,000 active-duty, Guard, Reserve and civilian forces serving in the United States and overseas. [Norty Schwartz, “Space, Cyberspace, and National Security,” Thursday, 18 February 2010, pg. <http://www.af.mil/shared/media/document/AFD-100219-034.pdf//edlee>]

To address these challenges, **we must** continue to **focus attention on enhanced** s**pace** s**ituational** a**wareness**. Our ability to conduct this vital mission not only helps us to characterize threats as either an intentional act by an adversary or the result of electromagnetic radiation, space debris, or any number of other hazards in outer space; they also help us to recognize anomalies in our own space constellations and evaluate options for such contingencies.

Our ability to track space objects – currently, over 20,000 of them – has operational implications uses of space not only for military and civil, but also for the enormously lucrative space system industry. Including sales of business communications, navigation through Global Positioning System handsets, remote sensing, and digital television and music for tens of millions of consumers, this segment of the industry topped 33 billion dollars of revenue in 2008 – neither a small nor completely mature undertaking at this point.

To enhance our space situational awareness, **we must** continue to **nurture our** resurgence in **space intelligence analytical and collection capabilities**. This process will take time, as decades of knowledge and experience are imparted from senior analysts to new ones, and new technical ways and means of collection are developed, managed, and implemented. This enhanced situational awareness not only will provide our Nation with the ability to evaluate our adversaries’ space orders of battle and clarify our understanding of their intent, but also to detect, mitigate, and otherwise respond to threats to our space assets.

Increased space situational awareness capabilities will also **bolster our space cooperation** with key international partners and allies. Through the sharing of our surveillance data, for example, we **provide mission assurance** for our cooperative efforts with enduring international partners.

Also, to maintain our current ability to leverage space, we must continue to nurture and further develop our technological superiority. In all likelihood, any sort of “space competition” in the foreseeable future will entail some elements of protecting and preserving our own space-borne capabilities. This demands that we maintain the cutting edge in technology, both from a government perspective, as well as with our industrial base. For example, it is well-known that our dependency on the Global Positioning System has also created certain vulnerabilities that our adversaries can exploit through jamming and other tactical denial techniques. While we remain unequivocally committed to proper stewardship and use of the world’s unparalleled standard in precision navigation and timing, as well as advancing enhanced capabilities with new GPS Block II-F satellites and next-generation GPS-III concepts, we also recognize the need to be able to continue to operate effectively, through improvement to GPS and other methods, in a denied or degraded localized environment.

Future Efforts for National Security Space

Current realities continue to suggest the inevitability of contested space. To prepare, we are starting at the very top. Back in December, Secretary Donley ordered a top-down evaluation of our management of military space responsibilities. Since 2001, when the last significant restructuring took place, new legal and regulatory requirements, as well as new agencies and authorities, have affected the structure of roles and responsibilities in our stewardship of national security space. We will ensure that, from the Pentagon to our space wings and centers, the appropriate structures and relationships are present to address the various challenges that I have just discussed, as well as other issues.

Our overall approach for the future must be capabilities-based; that is, instead of an emphasis solely on protecting satellites, we should also focus on preserving – through appropriate redundancies – the force-enhancing capabilities that our space systems provide. For example, space-based ISR capabilities should at least in part be backed up by other systems. In some situations, our highly-capable, remotely-piloted systems might be able to provide some compensating capabilities. They might not be identical, but we need to think in cross-domain terms when seeking such resilience.

Also, while we continue to pursue our efforts on Operationally Responsive Space, to build reliable and responsive operational enablers, and focus them “on timely satisfaction of Joint Force Commanders’ needs,” true agile responsiveness should emphasize effectiveness in meeting operational demands, irrespective of whether the solution is space-based or otherwise. And, because equipping our satellites with defensive capabilities requires tradeoffs with takeoff weight, fuel capacity, service life, and system utility, we should also take a capabilities-based approach to space defense. Protecting spacecraft certainly is a consideration, and in some cases may be the best approach, but we must first emphasize protecting capabilities. If a defensible posture can be achieved not only by hardening and improving maneuverability of large, complex satellites, but also by smaller, simpler satellites, then we might emphasize further development of some less exquisite augmentation systems. With flattening budgets and likely declining purchasing power, these sorts of tradeoffs, while difficult, must be considered.

Also, perhaps some solutions to satellite defensibility can be found in broader efforts to address root causes of potential rivalries in space, or in other efforts to deter broader conflict. Perhaps **through** bilateral or multilateral **cooperation, we can** end up **creat**ing **disincentives to attacking** our shared **space capabilities**. These partnerships can be political, financial, material, or all of the above. There are numerous options to be discovered with international engagement and partnerships in space.

Finally, in addition to technological superiority, there also must be **significant investment in human capital**. We benefit from over 46,000 Total Force Airmen, including contract employees, who are dedicated to space – from acquisition to operations to logistics – and who must continue to be strengthened through robust training and education, and equipped to tackle these challenges and others. While space and cyberspace certainly showcase our innovation and advanced technology, let us not forget that it is our Airmen, through their daily professional efforts, who make it all happen. The American people rightly expect unwavering devotion and excellence from them. It is our responsibility to ensure that our Airmen have the breadth of knowledge, tools, and cross-domain perspective that they will need to succeed. Pg. 4-7

#### That independently solves space war and conflict de-escalation

**Brown 8** [Maj Patrick A. Brown, USAF Space Protection Program (Integration) Headquarters Air Force Space Command/National Reconnaissance Office Peterson AFB, Colorado ,Promoting the Safe and Responsible Use of Space: Toward a 21st Century Transparency Framework , High Frontier November 2008 Volume 5, Number 1]

Past proposals for international confidence building space activities include more stringent debris mitigation, collision, and explosion avoidance measures, the development of safer traffic management practices, improved information exchanges, One could envision an international space community embracing earthly “green” practices to make space “environmentally friendly” and find methods and capabilities to “recycle” space debris. and notification measures related to space safety. In this regard, SSA is foundational. SSA is “the requisite current and predictive knowledge of the space environment upon which space operations depend—including physical, virtual, and human domains—as well as factors, activities, and events of friendly and adversary space forces across the spectrum of conflict.”¶ 4 Simply, shared SSA is the ability to discern the true nature of an event in space and take positive, full spectrum actions from notification, maneuver, and demarche to last resort military action to prevent a disruption to space services. The Department of Defense’s June 2008 National Defense Strategy tempers this best: The best way to achieve security is to prevent war when possible and to encourage peaceful change within the international system. Our strategy emphasizes building the capacities of a broad spectrum of partners as the basis for long-term security. We must also seek to strengthen the resiliency of the international system to deal with conflict when it occurs. We must be prepared to deal with sudden disruptions, to help prevent them from escalating or endangering international security, and to find ways to bring them swiftly to a conclusion.¶ 5 For the US, SSA enables command and control of space resources to ensure timely and accurate decision making for both military and non-military space operators and users. It enables decision makers the ability to fully leverage and protect American and allied space capabilities. SSA is developed by integrating, fusing, exploiting, analyzing, and displaying traditional and non-traditional space surveillance, reconnaissance, intelligence, and environmental sensor information and data sources along with system health and status information provided by space system operators.¶ 6 Finally, SSA promotes open communications and understanding providing a mechanism for escalation control and exclusion of misunderstandings. The challenges and opportunities of shared SSA can be illustrated by the pilot program, Commercial and Foreign Entities (CFE). Approved by the Office of the Secretary of Defense in October 2004, CFE provides two-line element sets, decay predications, launch support conjunction assessment and reentry support and anomaly resolution to qualified customers. However, balancing national security requirements of the US, allies and friends against the desire for transparency has resulted in less than complete information sharing. A renewed effort toward CFE would continue to function as a baseline to greater cooperation and collaboration on space surveillance data. The US should seek out and engage in mutually beneficial space partnerships and space engagement activities in order to promote sustainable space safety. Collaborative programs with allies, friends, and other states will be used to promote continuity of service, interoperability, and development of collaborative space systems, including grounds segments, when possible. These are important ways to share the cost of space capabilities, lower tensions, promote economic development through the use of commercial space activities and foster transparency. These actions will increase the use and value of space for the international community and assist in achieving key US assurance, dissuasion, and deterrence objectives. And with multinational cooperation to SSA, the value of shared SSA will increase exponentially. All space users have a vested interest in space, and unlike any other domain, we must continue to educate them on the cataclysmic effects of irresponsible use of space. Unlike a massive oil spill along a coastal plain or effects of irresponsible manufacturing plant runoff into rivers that Mother Nature can correct over time, effects in space are mostly permanent. In fact, a collision or massive explosion of large satellites at geosynchronous orbit has the potential to “pollute” the belt with debris for certainly our lifetime or longer without human intervention to “reclaim” the use of space orbits.¶ Shared SSA, consistent with the earlier attempts of defining transparency, will increase predictability in space, allow for timely maneuvering decisions on fuel and longevity concerns, and reduce uncertainty and misunderstanding for any purposeful interference conditions should they occur, and they will. Shared SSA, if successful as a transparency and confidence building measure, also reinforces other sharing efforts in Earth and space science, human space flight and space exploration. Again, the value and benefits are exponential.

#### Several impacts to space coop – 1 – Space weaponization – Multilateral space coop solves

**Moore 9** [“An Agenda for Obama: End America's Counterproductive Pursuit of Space Dominance”, Mike Moore, research fellow at the Independent Institute, author of many articles on national security, conflict resolution, nuclear weapons and proliferation, space weaponry, and related topics, and has spoken at many professional conferences and meetings sponsored by scientific organizations and policy institutes, former editor of The Bulletin of the Atomic Scientists, and has also served as the editor of Quill, the magazine of the Society of Professional Journalists, Carnegie Council, January 12, 2009]

Arms races do not always lead to armed conflict. But moral and ethical problems remain. Multilateral cooperation at all levels is the best way to solve or at least mitigate humankind's most pressing problems. Would the nations of the world be able to put together intense, imaginative, and productive multilateral initiatives to solve or mitigate problems in a global arms-race environment? To ask the question is to answer it. The opportunity costs of a space-related arms race could be desperately high.¶ The world's nations favor a new treaty that would prevent a space-related arms race. It is reasonable to suggest that most states mean what they say in this regard. But what about China and Russia, the most ardent proponents of a new treaty? Is their apparent affection for a new treaty real, or a cynical crowd-pleasing ploy? It is time to call their bluff. Let's begin serious talks in Geneva. America is so far ahead of everyone else in the military uses of space that it could afford to spend a few years in serious negotiations. If it becomes apparent after two or three years that the Chinese and Russians were just posturing, we will have learned something important.¶ However, if treaty talks make real progress, all nations would benefit. A tough, fully verifiable space treaty banning all space-related weapons would be hellishly difficult to negotiate. But in a century in which humanity faces monumental problems that require multilateral action, the world does not need a Cold War-style arms race in which space dominance would be the goal.¶ A great nation, a law-abiding power that seeks to influence the world by example, can do better than to offer up the old military-dominance paradigm. It can afford to be generous, visionary, and bold. And what could be bolder and more visionary than leading the world to a treaty that would ensure that space remains free of conflict? For the United States to systematically refuse to talk seriously about such a treaty—a treaty that every nation in the world, save two, wants—strikes me as fundamentally lawless behavior.

#### Space war outweighs nuclear

**Krepon 3** [president of the Henry Stimson Center, Michael, Space Assurance or Space Dominance? THE CASE AGAINST WEAPONIZING SPACE]

The inherent escalatory potential of satellite warfare between the United States and a major power such as China is exposed by such anodyne calculations. Any analysis of this scenario for preemptive attacks on space assets—whether initiated by the United States or by China—cannot assume that strikes would be confined to satellites. Moreover, escalation control in this scenario must be considered a highly dubious proposition. After all, the purpose of attacking objects in space, or attacking terrestrial targets from space, is to affect the conduct of military operations on Earth. It is therefore exceedingly **hard to envision war**fare **in space that does not spread** elsewhere, whether by asymmetric, conventional, or unconventional means. The resulting combat is likely to be less discriminating and proportional, and far more lethal, either because the stronger party has lost satellites used for targeting and precision guidance, or because the weaker party is unlikely to be concerned about collateral damage. Concepts of limited warfare and escalation control that were intimately associated with nuclear deterrence during the Cold War have not been propounded by U.S. advocates of space warfare. To engage in tit-for-tat, controlled warfare against satellites would suggest that the first kill of a satellite in the history of armed conflict would reflect a mere quest for balance or a novel form of message sending. The rationales provided by proponents of space control are notably different. The object of acquiring space warfare capabilities is to win, not to tie. In other words, U.S. advocates of space warfare capabilities are less interested in deterrence than in dominance and compellance.

#### Second – Relations – US-EU space collaboration is the key litmus test for sustainable cooperation

**Jankowitsch 10** [Peter Jankowitsch, Ambassador, Former Chair UNCOPUOS, July 2010, “Towards a new era in transatlantic cooperation”]

Transatlantic cooperation today is of course not the same as it was fifty or sixty years ago, when Europe and the United States faced a common enemy that made it much easier to overcome differences and serious breaches. Today Europe and the United States face a different world with different challenges and problems of a more and more global nature that call for global solutions, which they are required to provide. Therefore the question arises whether a relationship like the transatlantic cooperation, built on common values and economic interdependence is better suited to provide such global solutions to global problems than Europe or the United States alone.¶ An answer to this question can be found if we acknowledge that today the areas of transatlantic cooperation are far wider than in the times of the cold war and that they are no longer focused nearly exclusively on the defence and deterrence against a common enemy.¶ These areas today include such matters as climate change, nuclear proliferation and disarmament, terrorism (including cyber terrorism), organised crime, pandemics and last but not least the current economic and financial crisis. Additionally, regional conflicts like these in Afghanistan and the Middle East, a well as the nuclear ambitions of countries like Iran or North Korea require a common global involvement. Many of these problems and crises, many of these global conflicts, require global solutions that cannot be based solely on military contributions. Both Europe and the United States are deeply involved in the management of these crises and even if there is much argument about the level of European involvement in the more military aspects of these efforts, fairness requires to note that after all today more than 60,000 European troops are deployed in various missions abroad and that as far as military expenditures are concerned the EU accounts for one fifth of the total military spending worldwide. It is therefore certainly not only by its “soft power” that Europe aims to contribute to the global solution of global crises, even if its clear preference points to this direction.¶ While this may not always have been recognized on the other side of the Atlantic, it appears that today’s conditions for improved, more stable and more confidential transatlantic relations are much better than during the Bush years with their emphasis on unipolarity or the dream , in the words of Charles Krauthammer, of a ”unipolar moment”. This is evidenced by the new Obama National Security Strategy of last May that seems to be a clear reversal of previous defence doctrines, putting a renewed emphasis on international cooperation and engagement. The same spirit pervades many of the new approaches of this administration to space policy, not least the Augustine report that proposes many new options, including a renewed stress on international cooperation in space.¶ On the other hand, with the Lisbon Treaty coming into force Europe’s single telephone number, for which American foreign policy makers have been looking since the times of Henry Kissinger, could be found after all. This in itself does not yet solve of course all the problems with which transatlantic cooperation might be faced in the future, but a Europe that has brought its act together will certainly be an easier partner for America than a Europe eternally searching for the best possible shape of its institutions.¶ 3. The Present and Future of Transatlantic Cooperation in Space Activities¶ This is certainly also true in the area of Outer Space, where the need for effective and trustworthy Atlantic cooperation has always been very high. It is important to note here that from a historical point of view Europe did not come first as the principal partner of the United States in the area of space activities. In this regard, America’s first partner for cooperation (limited as it may have been) was the Soviet Union, which had even preceded the United States in some of its steps into space. The first major international event in space cooperation therefore was the famous Apollo–Soyuz flight that brought Soviet cosmonauts and American astronauts together in space. As a former chair of UNCOPUOS I can also testify to the fact that even at the height of the cold war Soviet- American cooperation in space continued, even at an often slow pace.¶ Therefore, it took Europe a little longer to enter into cooperative efforts with the United States, learning step by step how to establish a relation of trust and cooperation with a major partner. This is of course not the moment to recount the history of this relation, it is enough to say that in today’s world there is certainly no closer type of space cooperation than the one that exists between Europe and the US, with ESA being in many aspects the main European partner of NASA. A strong new base for space cooperation is certainly Europe’s new Space Policy, adopted in 2007 by ESA and the EU, which puts a strong emphasis on international cooperation.¶ For Europe, international cooperation will certainly be a key to the pursuit of its two flagship projects, Galileo and GMES, which are both in a stage of advanced preparation today. The same will be true if a possible third major area of European space policy, namely space exploration, would be more actively pursued in the future. Furthermore, there is growing European awareness of the increasing importance of space for security, a subject to which the outgoing Spanish Presidency of the EU has given much attention and which, in turn, will also require steps towards international cooperation.¶ While at the beginning of the transatlantic space cooperation ESA was the main European actor to engage in it, forging a lasting relationship particularly with NASA, the new role of the EU itself in space, bolstered recently by a special mandate given in the Lisbon Treaty, will bring the latter to the fore as well. The EU has already begun to perform this role in cases such as the GPS/Galileo conformity talks, among others. This role may increase, especially when space applications enter the broader area of the Common Defence and Security Policy. European space policy has also a third pillar next to ESA and the EU, namely the member States that remain largely autonomous in space activities. Within this sphere, major contributions to transatlantic cooperation can be perhaps expected from bilateral relations between certain larger EU countries and the US.

#### That solve several extinction risks

Stivachtis 2010 (Dr. Yannis A. Stivachtis, Director, International Studies Program, Virginia Polytechnic Institute, State University, 2010, “The Imperative for Transatlantic Cooperation,” google)

There is no doubt that US-European relations are in a period of transition, and that the stresses and strains of globalization are increasing both the number and the seriousness of the challenges that confront transatlantic relations. The events of 9/11 and the Iraq War have added significantly to these stresses and strains. At the same time, international terrorism, the nuclearization of North Korea and especially Iran, the proliferation of weapons of mass destruction (WMD), the transformation of Russia into a stable and cooperative member of the international community, the growing power of China, the political and economic transformation and integration of the Caucasian and Central Asian states, the integration and stabilization of the Balkan countries, the promotion of peace and stability in the Middle East, poverty, climate change, AIDS and other emergent problems and situations require further cooperation among countries at the regional, global and institutional levels. Therefore, cooperation between the U.S. and Europe is more imperative than ever to deal effectively with these problems. It is fair to say that the challenges of crafting a new relationship between the U.S. and the EU as well as between the U.S. and NATO are more regional than global, but the implications of success or failure will be global. The transatlantic relationship is still in crisis, despite efforts to improve it since the Iraq War. This is not to say that differences between the two sides of the Atlantic did not exist before the war. Actually, post-1945 relations between Europe and the U.S. were fraught with disagreements and never free of crisis since the Suez crisis of 1956. Moreover, despite trans-Atlantic proclamations of solidarity in the aftermath of 9/11, the U.S. and Europe parted ways on issues from global warming and biotechnology to peacekeeping and national missile defense. Questions such as, the future role of NATO and its relationship to the common European Security and Defense policy (ESDP), or what constitutes terrorism and what the rights of captured suspected terrorists are, have been added to the list of US-European disagreements. There are two reasons for concern regarding the transatlantic rift. First, if European leaders conclude that Europe must become counterweight to the U.S., rather than a partner, it will be difficult to engage in the kind of open search for a common ground that an elective partnership requires. Second, there is a risk that public opinion in both the U.S. and Europe will make it difficult even for leaders who want to forge a new relationship to make the necessary accommodations. If both sides would actively work to heal the breach, a new opportunity could be created. A vibrant transatlantic partnership remains a real possibility, but only if both sides make the necessary political commitment. There are strong reasons to believe that the security challenges facing the U.S. and Europe are more shared than divergent. The most dramatic case is terrorism. Closely related is the common interest in halting the spread of weapons of mass destruction and the nuclearization of Iran and North Korea. This commonality of threats is clearly perceived by publics on both sides of the Atlantic.

### Plan

#### The United States federal government should acquire, by purchase, Plutonium-238 for energy production in the United States from the European Space Agency.

#### Third – Cooperation solves debris

**Jankowitsch 10** [Peter Jankowitsch, Ambassador, Former Chair UNCOPUOS, July 2010, “Towards a new era in transatlantic cooperation”]

Benefits from this type of cooperation will not only go to Europe and the United States, but to the international space community as a whole. In the past, both Europe and the United States have become, time and again, the leaders in the creation of international rules and regulations for the safety and security of the space environment. Today the space environment is certainly in need of not only new rules and regulations regarding new challenges such as space debris or space traffic, but also of the constant review of the existing body of laws and standards, in order to adapt them to the new conditions and to a host of new actors and new threats. A well tried partnership like that of Europe and the United States, working with other old and new space actors, will certainly increase our ability to come to terms with these challenges.

#### Debris wrecks early warning – causes US-Russia war

**Lewis 4** [Jeffrey, Postdoctoral Fellow in the Advanced Methods of Cooperative Study Program and Former Staffer – Undersecretary of Defense for Policy, “What if Space Were Weaponized?”, Center for Defense Information, July]

This is the second of two scenarios that consider how U.S. space weapons might create incentives for America’s opponents to behave in dangerous ways. The previous scenario looked at the systemic risk of accidents that could arise from keeping nuclear weapons on high alert to guard against a space weapons attack. This section focuses on the risk that a single accident in space, such as a piece of space debris striking a Russian early-warning satellite, might be the catalyst for an accidental nuclear war. As we have noted in an earlier section, the United States canceled its own ASAT program in the 1980s over concerns that the deployment of these weapons might be deeply destabiliz- ing. For all the talk about a “new relationship” between the United States and Russia, both sides retain thousands of nuclear forces on alert and configured to fight a nuclear war. When briefed about the size and status of U.S. nuclear forces, President George W. Bush reportedly asked “What do we need all these weapons for?”43 The answer, as it was during the Cold War, is that the forces remain on alert to conduct a number of possible contingencies, including a nuclear strike against Russia. This fact, of course, is not lost on the Rus- sian leadership, which has been increasing its reliance on nuclear weapons to compensate for the country’s declining military might. In the mid-1990s, Russia dropped its pledge to refrain from the “•rst use” of nuclear weapons and conducted a series of exercises in which Russian nuclear forces prepared to use nuclear weapons to repel a NATO invasion. In October 2003, Russian Defense Minister Sergei Ivanov reiter- ated that Moscow might use nuclear weapons “preemptively” in any number of contingencies, including a NATO attack.44 So, it remains business as usual with U.S. and Russian nuclear forces. And business as usual includes the occasional false alarm of a nuclear attack. There have been several of these incidents over the years. In September 1983, as a relatively new Soviet early-warning satellite moved into position to monitor U.S. missile •elds in North Dakota, the sun lined up in just such a way as to fool the Russian satellite into reporting that half a dozen U.S. missiles had been launched at the Soviet Union. Perhaps mindful that a brand new satel- lite might malfunction, the of•cer in charge of the command center that monitored data from the early-warning satellites refused to pass the alert to his superiors. He reportedly explained his caution by saying: “When people start a war, they don’t start it with only •ve missiles. You can do little damage with just •ve missiles.”45 In January 1995, Norwegian scientists launched a sounding rocket on a trajectory similar to one that a U.S. Trident missile might take if it were launched to blind Russian radars with a high altitude nuclear detonation. The incident was apparently serious enough that, the next day, Russian President Boris Yeltsin stated that he had activated his “nuclear football” – a device that allows the Russian president to communicate with his military advisors and review his options for launching his arsenal. In this case, the Russian early-warning satellites could clearly see that no attack was under way and the crisis passed without incident.46 In both cases, Russian observers were con•-dent that what appeared to be a “small” attack was not a fragmentary picture of a much larger one. In the case of the Norwegian sounding rocket, space-based sensors played a crucial role in assuring the Russian leadership that it was not under attack. The Russian command sys-tem, however, is no longer able to provide such reliable, early warning. The dissolution of the Soviet Union cost Moscow several radar stations in newly independent states, creating “attack cor-ridors” through which Moscow could not see an attack launched by U.S. nuclear submarines.47 Further, Russia’s constellation of early-warn-ing satellites has been allowed to decline – only one or two of the six satellites remain operational, leaving Russia with early warning for only six hours a day. Russia is attempting to reconstitute its constellation of early-warning satellites, with several launches planned in the next few years. But Russia will still have limited warning and will depend heavily on its space-based systems to provide warning of an American attack.48 As the previous section explained, the Penta- gon is contemplating military missions in space that will improve U.S. ability to cripple Russian nuclear forces in a crisis before they can execute an attack on the United States. Anti-satellite weapons, in this scenario, would blind Russian reconnaissance and warning satellites and knock out communications satellites. Such strikes might be the prelude to a full-scale attack, or a limited ef- fort, as attempted in a war game at Schriever Air Force Base, to conduct “early deterrence strikes” to signal U.S. resolve and control escalation.49 By 2010, the United States may, in fact, have an arsenal of ASATs (perhaps even on orbit 24/7) ready to conduct these kinds of missions – to coerce opponents and, if necessary, support preemptive attacks. Moscow would certainly have to worry that these ASATs could be used in conjunction with other space-enabled systems – for example, long-range strike systems that could attack targets in less than 90 minutes – to disable Russia’s nuclear deterrent before the Rus- sian leadership understood what was going on. What would happen if a piece of space debris were to disable a Russian early-warning satellite under these conditions? Could the Russian military distinguish between an accident in space and the •rst phase of a U.S. attack? Most Russian early-warning satellites are in elliptical Molniya orbits (a few are in GEO) and thus dif•cult to attack from the ground or air. At a minimum, Moscow would probably have some tactical warn-ing of such a suspicious launch, but given the sorry state of Russia’s warning, optical imaging and signals intelligence satellites there is reason to ask the question. Further, the advent of U.S. on-orbit ASATs, as now envisioned50 could make both the more dif•cult orbital plane and any warning systems moot. The unpleasant truth is that the Russians likely would have to make a judgment call. No state has the ability to de•nitively deter-mine the cause of the satellite’s failure. Even the United States does not maintain (nor is it likely to have in place by 2010) a sophisticated space surveillance system that would allow it to distin- guish between a satellite malfunction, a debris strike or a deliberate attack – and Russian space surveillance capabilities are much more limited by comparison. Even the risk assessments for col-lision with debris are speculative, particularly for the unique orbits in which Russian early-warning satellites operate. During peacetime, it is easy to imagine that the Russians would conclude that the loss of a satellite was either a malfunction or a debris strike. But how con•dent could U.S. planners be that the Russians would be so calm if the accident in space occurred in tandem with a second false alarm, or occurred during the middle of a crisis? What might happen if the debris strike oc-curred shortly after a false alarm showing a mis-sile launch? False alarms are appallingly common – according to information obtained under the Freedom of Information Act, the U.S.-Canadian North American Aerospace Defense Command (NORAD) experienced 1,172 “moderately seri-ous” false alarms between 1977 and 1983 – an average of almost three false alarms per week. Comparable information is not available about the Russian system, but there is no reason to believe that it is any more reliable.51 Assessing the likelihood of these sorts of co- incidences is dif•cult because Russia has never provided data about the frequency or duration of false alarms; nor indicated how seriously early- warning data is taken by Russian leaders. More- over, there is no reliable estimate of the debris risk for Russian satellites in highly elliptical orbits.52 The important point, however, is that such a coincidence would only appear suspicious if the United States were in the business of disabling satellites – in other words, there is much less risk if Washington does not develop ASATs. The loss of an early-warning satellite could look rather ominous if it occurred during a period of major tension in the relationship. While NATO no longer sees Russia as much of a threat, the same cannot be said of the converse. Despite the warm talk, Russian leaders remain wary of NATO expansion, particularly the effect expan- sion may have on the Baltic port of Kaliningrad. Although part of Russia, Kaliningrad is separated from the rest of Russia by Lithuania and Poland. Russia has already complained about its decreas- ing lack of access to the port, particularly the uncooperative attitude of the Lithuanian govern- ment.53 News reports suggest that an edgy Russia may have moved tactical nuclear weapons into the enclave.54 If the Lithuanian government were to close access to Kaliningrad in a •t of pique, this would trigger a major crisis between NATO and Russia. Under these circumstances, the loss of an early-warning satellite would be extremely suspi-cious. It is any military’s nature during a crisis to interpret events in their worst-case light. For ex- ample, consider the coincidences that occurred in early September 1956, during the extraordinarily tense period in international relations marked by the Suez Crisis and Hungarian uprising.55 On one evening the White House received messages indicating: 1. the Turkish Air Force had gone on alert in response to unidenti•ed aircraft penetrat- ing its airspace; 2. one hundred Soviet MiG-15s were •ying over Syria; 3. a British Canberra bomber had been shot down over Syria, most likely by a MiG; and 4. The Russian •eet was moving through the Dardanelles. Gen. Andrew Goodpaster was reported to have worried that the con•uence of events “might trigger off … the NATO operations plan” that called for a nuclear strike on the Soviet Union. Yet, all of these reports were false. The “jets” over Turkey were a •ock of swans; the Soviet MiGs over Syria were a smaller, routine escort returning the president from a state visit to Mos- cow; the bomber crashed due to mechanical dif•culties; and the Soviet •eet was beginning long-scheduled exercises. In an important sense, these were not “coincidences” but rather different manifestations of a common failure – human er- ror resulting from extreme tension of an interna- tional crisis. As one author noted, “The detection and misinterpretation of these events, against the context of world tensions from Hungary and Suez, was the •rst major example of how the size and complexity of worldwide electronic warning systems could, at certain critical times, create momentum of its own.” Perhaps most worrisome, the United States might be blithely unaware of the degree to which the Russians were concerned about its actions and inadvertently escalate a crisis. During the early 1980s, the Soviet Union suffered a major “war scare” during which time its leadership concluded that bilateral relations were rapidly declining. This war scare was driven in part by the rhetoric of the Reagan administration, forti•ed by the selective reading of intelligence. During this period, NATO conducted a major command post exercise, Able Archer, that caused some elements of the Soviet military to raise their alert status. American of•cials were stunned to learn, after the fact, that the Kremlin had been acutely nervous about an American •rst strike during this period.56 All of these incidents have a common theme – that confidence is often the difference between war and peace. In times of crisis, false alarms can have a momentum of their own. As in the second scenario in this monograph, the lesson is that commanders rely on the steady flow of reli-able information. When that information flow is disrupted – whether by a deliberate attack or an accident – confidence collapses and the result is panic and escalation. Introducing ASAT weapons into this mix is all the more dangerous, because such weapons target the elements of the command system that keep leaders aware, informed and in control. As a result, the mere presence of such weapons is corrosive to the con•dence that allows national nuclear forces to operate safely.

#### Extinction

**Helfand and Pastore 2009** [Ira Helfand, M.D., and John O. Pastore, M.D., are past presidents of Physicians for Social Responsibility.

March 31, 2009, “U.S.-Russia nuclear war still a threat”, http://www.projo.com/opinion/contributors/content/CT\_pastoreline\_03-31-09\_EODSCAO\_v15.bbdf23.html]

President Obama and Russian President Dimitri Medvedev are scheduled to Wednesday in London during the G-20 summit. They must not let the current economic crisis keep them from focusing on one of the greatest threats confronting humanity: the danger of nuclear war. Since the end of the Cold War, many have acted as though the danger of nuclear war has ended. It has not. There remain in the world more than 20,000 nuclear weapons. Alarmingly, more than 2,000 of these weapons in the U.S. and Russian arsenals remain on ready-alert status, commonly known as hair-trigger alert. They can be fired within five minutes and reach targets in the other country 30 minutes later. Just one of these weapons can destroy a city. A war involving a substantial number would cause devastation on a scale unprecedented in human history. A study conducted by Physicians for Social Responsibility in 2002 showed that if only 500 of the Russian weapons on high alert exploded over our cities, 100 million Americans would die in the first 30 minutes. An attack of this magnitude also would destroy the entire economic, communications and transportation infrastructure on which we all depend. Those who survived the initial attack would inhabit a nightmare landscape with huge swaths of the country blanketed with radioactive fallout and epidemic diseases rampant. They would have no food, no fuel, no electricity, no medicine, and certainly no organized health care. In the following months it is likely the vast majority of the U.S. population would die. Recent studies by the eminent climatologists Toon and Robock have shown that such a war would have a huge and immediate impact on climate world wide. If all of the warheads in the U.S. and Russian strategic arsenals were drawn into the conflict, the firestorms they caused would loft 180 million tons of soot and debris into the upper atmosphere — blotting out the sun. Temperatures across the globe would fall an average of 18 degrees Fahrenheit to levels not seen on earth since the depth of the last ice age, 18,000 years ago. Agriculture would stop, eco-systems would collapse, and many species, including perhaps our own, would become extinct. It is common to discuss nuclear war as a low-probabillity event. But is this true? We know of five occcasions during the last 30 years when either the U.S. or Russia believed it was under attack and prepared a counter-attack. The most recent of these near misses occurred after the end of the Cold War on Jan. 25, 1995, when the Russians mistook a U.S. weather rocket launched from Norway for a possible attack. Jan. 25, 1995, was an ordinary day with no major crisis involving the U.S. and Russia. But, unknown to almost every inhabitant on the planet, a misunderstanding led to the potential for a nuclear war. The ready alert status of nuclear weapons that existed in 1995 remains in place today.

#### Ensures extinction from miscalc

**Mitchell 1** [Associate Professor of Communication and Director of Debate at the University of Pittsburgh, Dr. Gordon, ISIS Briefing on Ballistic Missile Defence, “Missile Defence: Trans-Atlantic Diplomacy at a Crossroads”, No. 6 July]

A buildup of space weapons might begin with noble intentions of 'peace through strength' deterrence, but this rationale glosses over the tendency that '… the presence of space weapons…will result in the increased likelihood of their use'.33 This drift toward usage is strengthened by a strategic fact elucidated by Frank Barnaby: when it comes to arming the heavens, 'anti-ballistic missiles and anti-satellite warfare technologies go hand-in-hand'.34 The interlocking nature of offense and defense in military space technology stems from the inherent 'dual capability' of spaceborne weapon components. As Marc Vidricaire, Delegation of Canada to the UN Conference on Disarmament, explains: 'If you want to intercept something in space, you could use the same capability to target something on land'. 35 To the extent that ballistic missile interceptors based in space can knock out enemy missiles in mid-flight, such interceptors can also be used as orbiting 'Death Stars', capable of sending munitions hurtling through the Earth's atmosphere. The dizzying speed of space warfare would introduce intense 'use or lose' pressure into strategic calculations, with the spectre of split-second attacks creating incentives to rig orbiting Death Stars with automated 'hair trigger' devices. In theory, this automation would enhance survivability of vulnerable space weapon platforms. However, by taking the decision to commit violence out of human hands and endowing computers with authority to make war, military planners could sow insidious seeds of accidental conflict. Yale sociologist Charles Perrow has analyzed 'complexly interactive, tightly coupled' industrial systems such as space weapons, which have many sophisticated components that all depend on each other's flawless performance. According to Perrow, this interlocking complexity makes it impossible to foresee all the different ways such systems could fail. As Perrow explains, '[t]he odd term "normal accident" is meant to signal that, given the system characteristics, multiple and unexpected interactions of failures are inevitable'.36 Deployment of space weapons with pre-delegated authority to fire death rays or unleash killer projectiles would likely make war itself inevitable, given the susceptibility of such systems to 'normal accidents'. It is chilling to contemplate the possible effects of a space war. According to retired Lt. Col. Robert M. Bowman, 'even a tiny projectile reentering from space strikes the earth with such high velocity that it can do enormous damage — even more than would be done by a nuclear weapon of the same size!'. 37 In the same Star Wars technology touted as a quintessential tool of peace, defence analyst David Langford sees one of the most destabilizing offensive weapons ever conceived: 'One imagines dead cities of microwave-grilled people'.38 Given this unique potential for destruction, it is not hard to imagine that any nation subjected to space weapon attack would retaliate with maximum force, including use of nuclear, biological, and/or chemical weapons. An accidental war sparked by a computer glitch in space could plunge the world into the most destructive military conflict ever seen.