By Thomas Graham, Jr.

Space Weapons and The Risk of Accidental Nuclear War

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

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

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

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

The Dangers of Failed Early Warning Systems

The Russian early warning system is in serious disrepair. This system consists of older radar systems nearing the end of their operational life and just three functioning satellites, although the Russian military has plans to deploy more. The United States has 15 such satellites. Ten years ago, on January 25, 1995, this aging early warning network picked up a rocket launch from Norway. The Russian military could not determine the nature of the missile or its destination. Fearing that it might be a submarine-launched missile aimed at Moscow with the purpose of decapitating the Russian command and control structure, the Russian military alerted President Boris Yeltsin, his defense minister, and the chief of the general staff. They immediately opened an emergency teleconference to determine whether they needed to order Russia's strategic forces to launch a counterattack.

The rocket that had been launched was

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actually an atmospheric sounding rocket conducting scientific observations of the aurora borealis. Norway had notified Russia of this launch several weeks earlier, but the message had not reached the relevant sections of the military. In little more than two minutes before the deadline to order nuclear retaliation, the Russians realized their mistake and stood down their strategic forces.

Thus, 10 years ago, when the declining Russian early warning system was stronger than today, it read this single small missile test launch as a U.S. nuclear missile attack on Russia. The alarm went up the Russian chain of command all the way to the top. The briefcase containing the nuclear missile launch codes was brought to Yeltsin as he was told of the attack. Fortunately, Yeltsin and the Russian leadership made the correct decision that day and directed the Russian strategic nuclear forces to stand down.

Obviously, nothing should be done in any way further to diminish the reliability of the space-based components of U.S. and Russian ballistic missile early warning systems. A decline in confidence in such early warning systems caused by the deployment of weapons in space would enhance the risk of an accidental nuclear weapons attack. Yet, as part of its plans for missile defense, the Pentagon is calling for the development of a test bed for space-based interceptors as well as examining a number of other exotic space weapons. In an interview published in *Arms Control Today*, Lt. Gen. Henry Obering, director of the Missile Defense Agency, touted what he said was "a very modest and moderate test-bed approach to launch some experiments." Obering said the Pentagon would only deploy a handful of interceptors: "We are talking about onesies, twosies in terms of experimentation."[2]

Despite Obering's claims, however, establishing a test bed for missile defense in space, as opposed to current preliminary research, would be a long step toward space weaponization. Once space-based missile defenses are tested, they are likely to be deployed, and in significant numbers, no matter if the tests are successful.

To see the path that a space test bed is likely to follow, one need only look at the present ground-based program: the Pentagon claims there is little true difference between a test bed and an operational deployment. Moreover, in space the deployment could be more dramatic. Although the current ground-based configuration envisions a few dozen interceptors, continuous space coverage over a few countries of concern would likely require a very large number of interceptors because a particular interceptor will be above a particular target for only a few minutes a day. Today's missile defenses provide very little real protection as the United States currently faces no realistic

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An interceptor missile is launched from the Marshall Islands December 2001 in what would prove a successful test of its ability to intercept an ICBM target, in this case a modified Minuteman ICBM launched from California's Vandenberg Air Force Base. The anti-ballistic missile system, which is currently being deployed in Alaska and California, has an inherent anti-satellite capability.

threat of deliberate attack by nuclear-armed long-range missiles. But space weapons could actually be detrimental to U.S. national security. They would increase the perceived vulnerability of early warning systems to attack and cause Russia and perhaps other countries such as China to pursue potentially destabilizing countermeasures, such as advanced anti-satellite weapons.

These dangers would be particularly worrisome for those components that are placed in geosynchronous orbits (GEO). Space objects in GEO are sufficiently far from the earth (about 36,000 kilometers) so that their speed roughly matches the rotational speed of the Earth and they remain "stationary" above one location. To be sure, any country that can place a satellite in these farther orbits—and there are several—could potentially threaten another country's satellites there. Yet, it would be easier to do so, and perhaps more importantly, the threat perception would be greater with weapons based in space than with existing ground-based technology. The 15 U.S. early warning satellites are almost entirely in GEO. The three functioning Russian early warning satellites utilize two different orbits. Two of the satellites use a highly elliptical orbit, which ranges from low-Earth orbit (LEO)—100 to 2,000 kilometers above the Earth where space objects travel at about 8 kilometers per second—out to GEO. The other satellite is permanently stationed in GEO.

Moreover, a space arms competition could hinder the flow of satellite imagery that can be used to track activities that might reveal programs to develop weapons of mass destruction in countries of concern. For example, activities detected through space-based collection systems can be used to trigger requests for inspections pursuant to the Chemical Weapons Convention (CWC) (implicitly) or the Comprehensive Nuclear Test Ban Treaty (explicitly), should that treaty be brought into force. It is important in this respect to recall that the suspicions that Israel and South Africa may have conducted an atmospheric nuclear test in 1979 were driven by readout from a U.S. VELA satellite.

Similarly, the United States has benefited from the revolution in national intelligence that began with and is based on photographic reconnaissance satellites and related systems, which has helped bring to an end the worst-case analysis and close calls with nuclear war that existed throughout the Cold War. If a truly peaceful and stable world order is ever achieved, the advent of this technology beginning in the late 1950s will be regarded by future generations as a major historical turning point.

These are crucial efforts that must never be allowed to be disrupted, either by space-based weapons or with the relatively simplistic ground-based anti-satellite weapon systems that could today be deployed. The United States has considerable anti-satellite weapons capability. An F-15-based homing vehicle system was successfully tested in the 1980s, and the anti-ballistic missile system currently being deployed in Alaska and California has an inherent anti-satellite capability. Right now, no other country is developing a counterspace system, although the Soviet Union successfully tested a co-orbital anti-satellite system in the 1970s and 1980s and Russia and China are believed to be capable of doing so. Notably, 28 countries have ballistic missiles that can reach LEO satellites, and all have the technical capability to develop a LEO anti-satellite system by modifying these missiles.

Active defenses—the deployment of devices intended to deflect, destroy, or render unworkable offensive systems—cannot by themselves be expected to provide adequate protection of space assets either now or in the long term. These technologies, as well as hardening and other passive means of defense, may provide some means of defending against the current generation of anti-satellite technology. Eventually, however, our would-be attackers would find ways to counter those defenses. Thus, it would appear that an agreed legal regime, predicated on mutually beneficial and, of course, verifiable restraint, should at least be considered.

Protecting Early Warning Systems

Rather than building space weapons, it may be best to put space off-limits for arms. Domestic law in major spacefaring countries around the world could prohibit programs for developing space-based weapons. To reinforce this effort, there could be a worldwide understanding that placing weapons in space or further developing existing anti-satellite weapons capability is contrary to international law and thereby a basis for economic and political pressure and punitive sanctions by a united world community. The best way to accomplish these twin objectives is by the development and negotiation of an international treaty on space weapons and anti-satellite weapons. Treaties become domestic law when ratified, and they can establish worldwide norms of behavior.

The Outer Space Treaty of 1967 is included in a unique class of arms control agreements sometimes referred to as nonarmament treaties. These agreements were intended to prevent and have been successful in preventing the deployment of weapons in areas where they have not previously been present. Today, after more than three decades, space remains free of weapons of mass destruction thanks to the Outer Space Treaty. Pursuant to the initiative of President Dwight Eisenhower, who at the time of his establishment of NASA made it clear that it was U.S. policy to keep space weapons-free, space remains free of weapons of all kinds. Space has long been militarized—early warning systems are military systems—but it has never been weaponized. This policy has served us well for decades, and there is a strong burden of persuasion on any who argue that it should be changed.

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Russian president Vladimir Putin and defense minister Sergey Ivanov look on from the nuclear missile cruiser Pyotr Veliky as a submarine launched ballistic missile fired from a Russian nuclear submarine soars in the distance during August 2005 military exercises in the Barents Sea.

It was asserted during the administrations of George H. W. Bush and Bill Clinton that there was no need for limitations beyond the existing Outer Space Treaty as no arms race or threat of an arms race in space existed. The Eisenhower policy held in the United States and was supported everywhere else. Consistent with the Bush-Clinton position, over the years, the United States routinely opposed the creation of a negotiating mandate for outer space at the Conference on Disarmament in Geneva. A number of years ago, a more formal effort began in Geneva and New York called Prevention of an Arms Race in Outer Space (PAROS). The United States did not support this, abstaining from voting on the resolution in the UN General Assembly each year. However, this year it voted no. Moreover, the standard argument for continuance of the Bush-Clinton position is no longer valid in the wake of the January 2001 report of the Rumsfeld Space Commission, which declared that a serious risk existed of a "Pearl Harbor in space."

It has been suggested that a legal regime to prevent the weaponization of space could be crafted simply by expanding or building on the Outer Space Treaty. There may be some merit to this notion, especially considering that the treaty has more than 90 states-parties. However, the subject is complicated, and there are many important interests to protect in addition to space assets for early warning and for intelligence and verification such as remote sensing, telecommunications, navigation, and the enhancement of ground-based military capabilities.

An expanded Outer Space Treaty could include first and foremost a prohibition on all weapons in space, both offensive and defensive, as they are not distinguishable. "Weapon" would have to be defined for the purposes of this treaty so as to exclude space objects with a peaceful purpose and items that are not relevant to the objective of preventing space weaponization. Also, space objects designed to support terrestrial military operations such as the Global Positioning System maintained by the U.S. Air Force should be explicitly permitted. Some kind of inspection of payloads of space launches would be necessary, perhaps modified by the principle of "managed access" as found in the CWC. Provisions on transparency of space activities and on information sharing would be required. These amendatory provisions could be negotiated in a separate stand-alone protocol to reduce somewhat the risk of reopening other provisions of the Outer Space Treaty.

Some have argued that it is premature to consider additional legal obligations in space, that informal "rules of the road" would get far more support. Others argue that the United States must resist the call for any new international legal obligations inhibiting the deployment of weapons in space. It is asserted that any such agreement or arrangement would be unenforceable and unverifiable and that "the ignominious record of enforcing and verifying treaties prohibiting activities on Earth is proof enough to give pause to any conversation about a treaty governing activities in space."[3]

Yet, where would we be without the nuclear Nonproliferation Treaty? Likely, more than 40 states would be armed with nuclear weapons, meaning that every conflict would run the risk of going nuclear, and nuclear weapons would be so widespread it would be impossible to keep them out of the hands of terrorist organizations. Where would we be without the strategic arms limitation and reduction agreements of the 1970s, 1980s, and 1990s? Likely, the United States and Russia would have so many nuclear weapons and long-range ballistic

missiles, they could never be controlled. Where would we be without the Outer Space Treaty? Nuclear weapons could be orbiting the Earth with the capability to strike anywhere, anytime without warning. Where are we now in the wake of the dissolution of the Anti-Ballistic Missile (ABM) Treaty? We possibly could be on the verge of actively considering the development and deployment of space-based ABM systems that would address no current or foreseeable threat but could unhinge strategic stability.

The history of the last 50 years teaches us that, if dangerous weapons and technologies are to be controlled to the safety and security of all, it must be done early, before the programs become entrenched. That time may well be now with respect to weapons in space. The United States does not have a secure future in space without broad and sustained international cooperation. The deployment of weapons in space, whether offensive or defensive, would make this necessary cooperation difficult if not impossible. There would likely be retaliation, which would seriously degrade the progress that has been made over the last five or six decades toward multilateral international cooperation in space.

The groundwork for a comprehensive treaty-based regime has been laid, and the importance of this objective is clear. Much work remains, but the creation of a space regime, under which the international community decisively enshrines space as a peaceful environment, ultimately is the only thoroughgoing alternative to a weaponized space free-for-all. Otherwise, the United States and the rest of the world risk being rendered forever vulnerable to the vagaries and fluctuations of technology development and political instability and international peace and security in the 21st century is fundamentally undermined. In this age of a worldwide struggle against international terrorism, this is the last thing we should want.

Preventing the weaponization of space is of paramount importance to world stability. Any deployment of weapons of a significant nature in space, particularly highly capable weapons systems such as a space-based missile defense, could provoke countermeasures. There are many important assets in space, and it is highly likely that they will only continue to flourish in the current sanctuary environment in place since the days of Eisenhower. Above all, we should never take the slightest chance of impairing early warning systems on which the long nuclear peace between the United States and Russia may continue to depend. **ACT**

ENDNOTES

1. Michael Krepon, "Space Weapons and Proliferation," *Nonproliferation Review*, September 2005.

2. "Defending Missile Defense: An Interview With Missile Defense Agency Director Lt. Gen. Henry Obering," *Arms Control Today*, November 2005, pp. 6-11.

3. Jeff Kueter and Andrew Plieninger, "Saving Space: Securing Our Space Assets," *Marshall Institute Policy Outlook*, July 2005.

Stringer/AFP/Getty Images

Cadets from Russia's Military Institute of the Strategic Missile Forces climb aboard the mobile launcher of a SS-27 Topol-M intercontinental ballistic missile. Russia has begun deploying the advanced missile, whose potential use depends on an early warning system that is in serious disrepair. Russia fears that U.S. space-based missile defense interceptors might be able to eliminate Russia early warning satellites quickly and without warning.