

The 21st Century Nuclear Arsenal

*Rethinking and Reshaping the American Nuclear Deterrent
and its Forces for the 21st Century*



American Security Project



White Paper

Matthew Wallin

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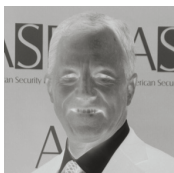
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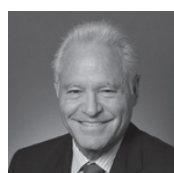
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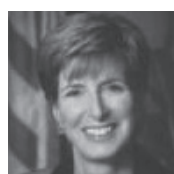
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IN BRIEF

- Reducing the size of the nuclear arsenal is beneficial for U.S. national security in the 21st century.
- America can retain a strong deterrent with fewer nuclear weapons given the changing nature of the international system.
- The U.S. should reanalyze its non-proliferation apparatus and consider a mechanism for a coordinated national anti-proliferation strategy.
- The U.S. has an interest in ratifying the Comprehensive Test Ban Treaty. Technological advances have eliminated the need for U.S. explosive nuclear testing, but a resumption of testing by other countries would be a threat.
- Lawmakers and media should pay more attention to nuclear issues.

About the Author

Matthew Wallin is a fellow at the American Security Project specializing in public diplomacy, military history, nuclear security, and international conflict. Originally from Los Angeles, Matthew completed his Master's in Public Diplomacy from the University of Southern California in 2010. He is a WWII "living historian," professional photographer, and member of the Public Diplomacy Council.



Introduction

Perhaps no other weapon in the U.S. arsenal has proven as numerous, expensive, and unusable as the nuclear warhead.

The nuclear paradigm that existed over the course of the Cold War no longer holds relevancy in today's world. The foe that threatened the existence of the United States over that nearly half-century period no longer exists. More than 20 years after the end of that mortal threat, the United States is still postured to fight an enemy that does not exist. In the meantime, there are real 21st century threats the U.S. is not confronting adequately.

Today, the U.S. faces a stark choice. It can continue to fund and support a nuclear weapons apparatus intended for a 20th century standoff, or it can divert this funding to combat the threats it actually faces in the 21st century.

The American Security Project contends that in this new century, the United States can reduce its nuclear arsenal while still maintaining a strong deterrent, and it can realign its diplomatic and military posture to better face the challenges of today's world. This does not imply that the U.S. should unilaterally disarm, but rather that it should take a comprehensive look at its nuclear strategy.

This white paper explores a variety of nuclear issues facing America today, including: the concept of a 21st century deterrent; rightsizing the nuclear force; proliferation and terrorism; the Comprehensive Test Ban Treaty; and the reasons why lawmakers and the media should be paying more attention to these issues.



A 21st Century Nuclear Deterrent

“The evolving nature of the international system in the 21st century requires we realign our strategies to meet new realities. Our current nuclear deterrence doctrine is organized around confronting 20th century foes, and must be strategically adjusted to effectively meet the threats of today.”

-Lt. General Donald Kerrick, USA (Ret)

Key Points

- The U.S. needs a three-tiered system for deterrence to account for changes in the international system.
- The current U.S. nuclear deterrent is not effective against terrorists and may not be credible against “rogue states,” therefore leading countries protected by the “nuclear umbrella” to seek their own nuclear arsenals.
- Confidence-building steps are needed between the U.S. and other nuclear powers to ease suspicion over nuclear reduction strategy.

The “one size fits all” policy of assured destruction is ill-suited for the variety of nuclear challenges the U.S. faces today. Designed to deter an attack from an opponent like the former Soviet Union, it is less applicable in the modern era.

For reasons including technological developments, evolving legal and moral trends, and changes in strategic doctrine, a growing basis has emerged for a U.S. national security policy that does not rely on nuclear weapons.

Given the growth of public response enabled by 24-hour news and social media, modern internal dynamics of command and control, as well as standards regarding the role of civilian casualties in war, the response to a limited nuclear attack by a rogue regime or non-state actor is less likely to be made by nuclear weapons. As such, the premise of a deterrent through nuclear retaliation has lost credibility, and assured destruction can no longer be relied upon.

This in turn may cause other nations to lose faith in the protections supposedly afforded under the U.S. “nuclear umbrella”—and lead them to seek out their own nuclear arsenals for security guarantees. Though nations currently under the U.S. umbrella take America’s commitments very seriously, the world’s evolving standards for retaliation could shake their confidence in whether or not the U.S. will sufficiently respond to a nuclear attack on their soil.

In light of this challenge to nuclear-credibility, it is important to devise more rapid and effective non-nuclear means for providing the deterrence, defense, and geopolitical functions that were normally thought to be provided by U.S. nuclear weapons.

Military technologies are progressing to the point where non-nuclear weapons can be relied upon to perform many of the functions historically assigned to the nuclear arsenal. This could potentially involve a range of special forces, or cyber and other non-kinetic warfare options.

Much of the research and development efforts in the realm of non-nuclear options have been focused on the Conventional Prompt Global Strike system,¹ which “would allow the United States to strike targets anywhere on Earth with conventional weapons in as little as an hour.”²

Efforts to develop systems and strategies that allow for the marginalization of nuclear weapons in U.S. grand strategy are partly stimulated by the widespread revulsion against the tactics of mass indiscriminate killing of civilians by terrorists and tyrants. It is generally agreed that even in response to a direct nuclear attack on an allied city by a rogue regime, that a retaliatory nuclear attack on the perpetrator nation’s capital city or main military base may not be politically or morally feasible. For the threatened retaliation and therefore deterrence to be credible, the Commander-in-Chief must have alternatives to mass-destruction.

A Three-Tiered System of Deterrence

Given the range of threats facing the U.S., America needs a three-tiered approach to nuclear deterrence. The first tier would retain traditional ideas of deterrence; it would encompass mass-nuclear attacks from states with large nuclear forces and large command and control networks, where the mutual assured destruction (MAD) policy still holds weight. However, true tier one threats pose little danger to the U.S. in the 21st century.

The second tier must provide the U.S. with rapid and effective non-nuclear retaliatory options that serve as a more credible deterrent to emerging or “low” nuclear powers.

In this second tier, what is ultimately required, especially to give credibility to deterrence umbrellas, is the ability to rapidly and fundamentally disable an aggressor’s small command and control structure while avoiding substantial collateral damage to civilians. It must provide retaliatory options that serve as a more credible threat to that aggressor’s interests.

A third tier would encapsulate non-state actors such as terrorist groups. Fortunately, much of the programmatic structure already exists for this, as the third tier essentially combines elements of government non-proliferation programs aimed at prevention (as opposed to deterrence). Traditional forms of deterrence are often ineffective against the transnational nature and suicidal tactics of such groups, and thus do not apply. Therefore, these groups must be prevented from obtaining nuclear materials in the first place.

What are we deterring?

The method employed for deterrence may be dependent on the scenario. As such, there are a variety of nuclear attack scenarios the United States should foresee in its deterrence strategies. For instance:

- 1.) A mass nuclear attack on U.S. or allied soil by a large nuclear power.
- 2.) A small nuclear attack on U.S. soil by a rogue country.
- 3.) A small nuclear strike on non-U.S. soil by a rogue country.
- 4.) A nuclear detonation or dirty bomb on U.S. soil by a non-state actor.

Ultimately, the urgency of developing major conventional strategic-strike options to replace portions of a nuclear arsenal ill-suited to today's threats should not be underestimated. However, with consideration added for the time it takes to develop appropriate technologies, the implementation of this three-tier strategy will need to be taken gradually.

Implementation Issues and Confidence Building

A post-MAD, de-nuclearization policy has its own risks. Measures taken for defensive purposes could be interpreted as offensive by other countries, resulting in increased tensions or an arms race. For instance, a dangerous spiral of misperceptions could be provoked by the stipulation in the new nuclear guidance document that the U.S. military should maintain significant counterforce capabilities against potential adversaries.

Illustrating this point, the Russians have protested reported Pentagon plans to outfit decommissioned nuclear ICBMs with conventional warheads³ and have threatened to develop a similar system of conventionally armed ICBMs of their own.⁴ This also presents points of contention over whether or not conventionally-armed ICBMs count against the provisions of existing arms control agreements—an issue which has not been explicitly answered. Already worried that U.S. deployments of missile defense systems against rogue nuclear states might be used against Russian missiles, the Kremlin is alleging that the U.S. is seeking to bypass previous arms control agreements under the guise of nuclear reductions.

China, having worked hard to build up its forces to emulate Russia's mutual strategic deterrence relationship with the United States, has been making similar allegations. Beijing questions the veracity of Washington's

claims that the missile-defense systems the United States is installing in Asia have only a North Korea focus. From Beijing's perspective, the Obama Administration's campaign to make nuclear mass-destruction retaliation illegal and immoral is a strategy to negate China's possession of nuclear weapons as an equalizer against America's air and sea capabilities.

The complaints of the Russians and Chinese are in part disingenuous, for they too are working on alternative deterrence strategies. Of course, all of this ties into the previously mentioned potential for security escalations fueled by misunderstanding.

What constitutes credible deterrence?

Credible deterrence must consider an adversary's overall goals. It should not be based solely on U.S. perceptions, but rather should involve denying an acceptable outcome for the adversary. Assured destruction of that enemy could actually be an acceptable outcome, if survival is not required in order to accomplish a strategic goal.

Credible deterrence must also threaten action which an adversary actually believes the U.S. will undertake. If that adversary does not believe the U.S. will respond to a nuclear attack with nuclear retaliation, it must believe the U.S. will undertake another type of action which would still rapidly and fundamentally render the strategic goals of that adversary unachievable. The threat of mass nuclear retaliation does not necessarily accomplish this goal in the 21st century.

Avoiding catastrophic calamities in such a miscalculation-prone environment will require imaginative and resourceful confidence-building and conflict-resolution initiatives to fill the void left by the U.S. shift to non-MAD options. The risks that conventionally-

armed ICBMs, for example, could be misperceived as having been actually armed with nuclear warheads could potentially be mitigated by housing the conventional ICBMs in bases that are not equipped to store and handle the nuclear warheads, and allowing the Russians and Chinese to thoroughly inspect these facilities.

Other confidence-building measures could include allowing the Russians and Chinese to become familiar with the different payload-arming and launch procedures for the conventional and nuclear missiles, as well as inviting their military experts to witness test launches. Meanwhile, other measures to avoid mutual misperceptions by adversaries could be instituted, such as de-alerting both nuclear and conventional strategic missiles.⁵

Of course, in intense confrontations driven by geopolitical crises, each side will be inclined to suspect even these confidence-building measures as ruses designed to put the enemy off guard. But in periods of relative calm, they can do much to reassure an otherwise paranoid adversary of one's adherence to arms control agreements.

Detering North Korea

North Korea's key strategic interest is the preservation of its regime. Its dangerous behavior is specifically aimed to bolster domestic support, and deter regime change by the U.S.-R.O.K alliance by making the price of doing so appear too costly.

As the North Korean regime undoubtedly understands it would be unable to win a war on the peninsula, it is extremely unlikely to launch action that it believes will ultimately lead to its destruction, including a nuclear first strike or an invasion of the South. It is, however, more likely to use a nuclear weapon if it believes the survival of its regime is truly in jeopardy, as would be the case in a retaliatory or preemptive U.S./South Korean invasion of the North. Therefore, nuclear deterrence against North Korea ultimately hinges on deterring the outbreak of a new Korean War.

Conclusion

If it is no longer a MAD world, then our planet is not fully on the way to becoming a sane one either—that is, no longer bristling with weapons of mass destruction. As traditional methods of nuclear deterrence are challenged by the changing nature of the international system, the U.S. must adapt to meet the challenges posed by the 21st century. Nuclear deterrence against Russia, or even China, is not the greatest difficulty faced by the U.S. on this front. Rather, it is developing a new, second tier of deterrence that is better suited to face the threats posed by nascent nuclear powers.

Recommendations

- Institute a three-tier nuclear deterrent strategy for addressing those actors still deterred by MAD, and those that are not.
- Develop effective non-nuclear deterrence options against those states and actors not deterred by the U.S. nuclear arsenal.
- Seriously consider confidence-building measures to reassure states that are suspicious about U.S. de-nuclearization efforts.

Rightsizing our Nuclear Force

“Numbers alone no-longer represent the basis of a credible nuclear deterrent. Reducing the size of the U.S. nuclear stockpile not only allows us to spend money on the weapons we really need, but it reduces the risk of accidents, reduces waste, and increases America’s national security.”

–Lt. General Arlen “Dirk” Jameson, USAF (Ret)

Key points

- The U.S. nuclear arsenal is not aligned with today’s threats.
- The cost of maintaining an arsenal at its current size is excessive.
- Reducing the size of the nuclear arsenal makes the U.S. safer.
- Reducing the number of nuclear weapons worldwide reduces the risk of proliferation.

Even before the Cold War ended, U.S. policymakers were laying the foundation for the nuclear arsenal of the future. In his second inaugural address in 1985, President Ronald Reagan laid out his vision for national security, proclaiming:

“There is only one way safely and legitimately to reduce the cost of national security, and that is to reduce the need for it. And this we’re trying to do in negotiations with the Soviet Union. We’re not just discussing limits on a further increase of nuclear weapons; we seek, instead, to reduce their number.”⁶

President Reagan’s successors built on his call for nuclear reductions. President George H.W. Bush oversaw a fifty percent reduction to the U.S. nuclear stockpile. Another fifty percent reduction was implemented under President George W. Bush. These reductions allowed the U.S. to eliminate excessive nuclear capabilities while maintaining a credible nuclear deterrent.⁷

Despite this progress, today the U.S. nuclear arsenal is still weighed down by an unnecessary and excessive stockpile of weapons. As of March 2014, the U.S. still had 1,585 deployed strategic nuclear warheads,⁸ plus thousands more in reserve, and Russia is in a similar situation. Together, the U.S. and Russian arsenals account for over 90 percent of the world’s nuclear weapons.⁹

There is a growing consensus for a new round of nuclear reductions, possibly including bilateral, verifiable negotiations with Russia—but an agreement with Russia should not dictate America’s ability to independently determine whether further nuclear reductions better fit its national security needs. Regardless of a possible new U.S.-Russia arms control agreement, many respected military leaders, former national security officials, and current policymakers support strategic reductions and effective investments that will maintain an effective deterrent while allowing the U.S. to divert resources to programs and equipment that better support our warfighters.

Some of these leaders are Republicans; some are Democrats. They may not agree on all national security

issues, but they do agree that the U.S. can maintain a credible nuclear deterrent with far fewer than the 1,550 warheads allowed under the New START Treaty. Such a deterrent is, in actuality, achievable with fewer than 1,000 warheads. Of course, as these reductions are enacted, a thorough analysis of nuclear technologies, types, and capabilities may be required to ensure the deterrent is as effective as possible.

Former Senator Sam Nunn shares the view that fewer nuclear weapons are needed for a deterrent and endorses setting an example for the world.¹⁰

Former Secretary of State Colin Powell argued for nuclear reductions on the grounds that maintaining unnecessary nuclear weapons at the expense of other critical defense programs does not make sense:

“We have every incentive to reduce the number [of nuclear weapons].... These are expensive. They take away from soldier pay. They take away from lots of things. There is no incentive to keep more than you believe you need for the security of the nation.”¹¹

In 2008, Senator John McCain voiced his belief that the U.S. nuclear arsenal should be reduced:

“While we have serious differences, with the end of the Cold War, Russia and the United States are no longer mortal enemies. As our two countries possess the overwhelming majority of the world’s nuclear weapons, we have a special responsibility to reduce their number.”¹²

A smart strategy for nuclear reductions should be bipartisan in nature. Eliminating unneeded nuclear weapons frees up resources for more relevant defense programs, thus making the U.S. safer.



A Trident missile launched from a U.S. submarine. U.S. Navy Photo.

Reducing the number of nuclear weapons also reduces the risk of accidents or security failures.

The nuclear security system in the U.S. is far from flawless. In August 2013, for the third time in five years, an Air Force nuclear missile unit failed a nuclear “surety” inspection,¹³ which is meant to ensure the arsenal is safe, secure, and ready.¹⁴ In 2007, unknown to the crew, a B-52 flew across the U.S. mistakenly armed with nuclear cruise missiles, sitting on the runway after landing for ten hours before personnel noticed it was carrying nuclear warheads.¹⁵ In 2006, the U.S. mistakenly shipped four nuclear missile fuses to Taiwan, not realizing the mistake until two years later.¹⁶ In 2012, three individuals breached security at the Oak Ridge Y-12 National Security Complex, which processes, handles, and stores weapons-grade uranium.¹⁷

But there are other steps beyond simple reductions that U.S. policymakers can and must take to update our nuclear deterrent for the 21st century. This will require strict, honest scrutiny of all aspects of the U.S. nuclear apparatus.

The triad of nuclear delivery systems – bombers, submarines, and land-based missiles – is the perfect example of nuclear capabilities that have escaped scrutiny in the two decades since the end of the Cold War. Plans to modernize all three legs of the triad are moving forward, although the strategic utility of each platform is unclear. The U.S. should undertake a full strategic review of the triad in order to reevaluate its effectiveness against today’s threats and determine if a realignment is necessary.

Similarly, the U.S. is planning to invest in a variety of expensive and unnecessary infrastructure projects. For example, the Mixed Oxide Fuel facility, a nearly \$8 billion project that has far exceeded its original \$1

billion price tag, is designed to convert surplus U.S. weapons-grade plutonium into a combination uranium-plutonium fuel for nuclear reactors—a product that is not currently unusable in the United States and thus has no customer base.¹⁸

The reality is that costs of maintaining an excessive nuclear force are significant. The U.S. is on track to spend over half a trillion dollars on nuclear weapons and related programs over the next ten years.¹⁹

Many of these capabilities, from thousands of nuclear warheads to brand new nuclear facilities, are not designed to deal with the asymmetric threats that are most challenging to U.S. national security. By investing billions in nuclear capabilities that do not address today's threats, we risk under-investing in the capabilities we need for national defense.

U.S. policymakers, both in the Executive and Congress, must work to develop a nuclear strategy that makes sense in the 21st century, and allocate resources accordingly.

As LtGen. Dirk Jameson, former Deputy Commander-in-Chief of U.S. Strategic Command, recently wrote, “Having more weapons doesn't mean we are ‘winning’—or will even succeed in deterring others from pursuing nuclear weapons. It merely reflects that our nuclear strategy is ill-suited to our times.”²⁰

When considering the size of the nuclear arsenal, and what constitutes an effective deterrent, policy makers must consider that Mutually Assured Destruction is no longer a “one size fits all” policy that applies to the gamut of challenges the U.S. may face in the nuclear realm. The size of the U.S. arsenal has not deterred rogue countries from pursuing nuclear weapons, nor has it deterred terrorist groups from seeking loose nuclear material.

It is the responsibility of Congress to account for these challenges when determining an appropriate size for a strategic nuclear deterrent. The question is, do the thousands of nuclear warheads in its arsenal actually deter or provide retaliatory options against the “tier 2” nuclear threats the U.S. primarily faces today? Under the strict scrutiny that Congress should be applying, it does not appear so. So why does America still have so many?

Updating our nuclear strategy will not be easy. It will require serious effort on many fronts, from negotiations with Russia to scrutinizing the nuclear budget. In the end, however, it will be worth the effort. A nuclear strategy that reflects the new role of nuclear weapons in the 21st century will strengthen U.S. national security.



National Museum of the USAF's collection of American ICBMs.

Recommendations

- Conduct a full review of the triad, its effectiveness, and whether all three legs are necessary for maintaining the strength of the U.S. deterrent.
- Reduce the deployed stockpile to a level lower than 1,000 warheads.
- Conduct a review of nuclear security policies and measures to reduce the error rate to zero.

Proliferation and Terrorism

“The greatest nuclear fear of this century has not been a potential nuclear attack by a nation-state, but the fear that nuclear materials may fall into the hands of a non-state actor. But if we are vigilant, and if we are diligent, we can prevent this fear from developing into a shocking reality.”

–BGen. Stephen A. Cheney, USMC (Ret)

Key points

- Proliferation of loose nuclear material is not an imagined problem.
- The U.S. should bolster proven, effective programs for combating the spread of nuclear material.
- The most effective means for combating proliferation are through cooperative agreements that increase the number of eyes on the problem.
- A coordinating body for proliferation prevention should be created to maximize program effectiveness.
- A national strategy for responding to incidents of nuclear terrorism needs to be developed.

The thought of a nuclear weapon obtained by a terrorist group has been a real fear since the breakup of the Soviet Union, when the collapse of the governmental system left nuclear weapons and materials across borders in newly independent countries. The very real possibility of these materials falling into the wrong hands is one that persists more than 20 years later.

This is not an imagined threat. While the risk of an actual nuclear warhead falling into terrorist hands is less probable, the smuggling of uranium is documented and real.²¹ Laced into a conventional explosive, uranium has the potential to be exploded as part of a “dirty bomb” that would spread radioactive contamination.

The International Atomic Energy Agency, originally conceived as part of President Eisenhower’s Atoms for Peace program,²² is now the primary data collector in terms of nuclear proliferation. It has created an Illicit Trafficking Database (ITDB) through which it receives reports from 120 countries (as of December 2012), about nuclear materials.²³

The ITDB received 2,331 reports of nuclear-related “incidents” 1993 and 2012, 16 of which involved highly enriched uranium or plutonium.²⁴

The potential damage resulting from unchecked nuclear proliferation should not be underestimated. A report by the Nuclear Threat Initiative explores the consequences of a 10-kiloton nuclear explosion in Grand Central



Mobile radiation detection equipment. U.S. CBP Photo.

Station in New York City. More than half a million people would be killed immediately from this blast with an additional few hundred thousand suffering burns, wounds from debris, or radiation sickness. In addition, the blast would obliterate surrounding skyscrapers and result in the complete evacuation of Manhattan. While the costs of 9/11 were estimated at \$93 billion, the costs of this hypothetical explosion would be well over \$1 trillion.²⁵

But a nuclear-powered explosion is not the only type of event that could cause significant damage. At an ASP event analyzing port security, Dr. Stephen Flynn commented on the effects a “dirty bomb” transported into the U.S. via the world shipping system would have:

“What we have right away is probably a response that says we’ve got to freeze the system until we sort out this risk, kind of like we did on 9/11 with aviation... Well, basically in 2 weeks we’ll put the entire global intermodal transportation system into gridlock—and there is no plan today for how to get it back up and running. And in that time, the bulk of what moves in a global economy is essentially frozen.”²⁶

The world-wide economic damage would be immense as commerce essentially comes to a halt.

The potential consequences of nuclear proliferation are thus too grave to ignore. Historically, the U.S. has demonstrated exceptional leadership in being a driving force behind efforts to prevent proliferation. It is vital that the U.S. continues to invest in the tools, programs, agencies, and international arms-control regimes that effectively contribute to reducing the threat of proliferation.

Today, there are a variety of tools at the disposal of the United States that aid in the ability to track and prevent the proliferation of nuclear materials, technology and knowledge. The following sections explore some of the current efforts aimed at preventing proliferation.

Cooperative Threat Reduction – Department of Defense

Perhaps one of the most effective ways that the potential proliferation of loose nukes was halted after the fall of the Soviet Union was by the Cooperative Threat Reduction Treaty (CTR, Nunn-Lugar Treaty). By federally funding nonproliferation and disarmament in former Soviet countries, CTR has had extreme success. Since 1991, more than 7,600 warheads have been deactivated, over 2,300 missiles have been destroyed, and 24 nuclear weapons storage sites have been secured.²⁷

Before the capitulation of the Soviet Union in 1991, 27,000 nuclear weapons and enough weapons-grade plutonium and uranium to triple that number existed in the Soviet bloc.²⁸ Due to the political, economic, and social chaos that followed 1991, many of the nuclear weapons and materials remained in the countries in which they were stored or deployed, and Russia could not reconsolidate its arsenal. Western countries worried that amongst this chaos, nuclear weapons or materials would surely have gone missing.

Though CTR has proven effective over its history, the program should be carefully examined to determine its future. Originally intended only for former Soviet nations, the CTR has expanded its role to general nonproliferation.

In 2013, Russia did not renew its commitments under the framework of CTR. A new agreement under the framework of the 2003 Multilateral Nuclear Environmental Program, signed on July 14, continued certain elements of collaboration from CTR,²⁹ but appears to be much more limited in scope.³⁰ It ends cooperative

efforts to dismantle missiles, bombers, and chemical weapons.³¹

National Nuclear Security Administration – Department of Energy

The NNSA has a multi-pronged approach to nuclear security, addressing domestic export licensing, international exports, and the spread of knowledge.³² This strategy reflects the reality that proliferation can occur outside the realm of nuclear warheads themselves.

To apply for a domestic export license, commercial businesses go through a rigorous assessment by government monitors. The nuclear materials being transported must be deemed safe to transport, appropriate for their final purpose, and the recipients of these materials must be considered safe and responsible.³³

The NNSA also helps regulate international exports of nuclear material. To ensure the safety of these materials, they have established partnerships with organizations and enterprises within other countries to encourage awareness of proliferation threats and to help other governments securely trade nuclear materials.³⁴

Finally, the term “loose nukes” can also refer to the former scientists themselves who participated in nuclear technologies. To control WMD expertise, the NNSA has begun reintegrating these scientists into their communities and has implemented workshops to help train them in other fields. According to the NNSA, “The former WMD personnel, originating from Iraq, Libya, Russia and other former Soviet states, engage in partnerships with U.S. companies to develop peaceful commercial technologies.”³⁵ These efforts are essentially intended to reduce the likelihood that financial strain or unemployment would tempt a scientist to sell nuclear secrets.

Global Threat Reduction Initiative – Department of Energy

Established in 2004, the Global Threat Reduction Initiative (GTRI) is the creation of the National Nuclear Security Administration and was intended to, “as quickly as possible, identify, secure, remove and/or facilitate the disposition of high risk vulnerable nuclear and radiological materials around the world that pose a threat to the United States and the international community.”³⁶ Active internationally, the GTRI has had great success since its creation and has “accelerated” its efforts since President Obama’s Prague Speech in 2009, during which he called for all vulnerable nuclear material to be secured.³⁷



Removing highly enriched uranium from Hungary. NNSA Photo.

Office of Weapons of Mass Destruction Terrorism – Department of State

The State Department’s Office of Weapons of Mass Destruction Terrorism has three key efforts underway. The Global Initiative to Combat Nuclear Terrorism is a multilateral effort with 85 nations to strengthen policy and procedures to respond to a terrorist attack involving WMDs. The Smuggling Response Team and the Nuclear Smuggling Outreach Initiative work to prevent terrorist acquisition of nuclear and radiological materials that could be used for an attack. Lastly, Foreign Consequence Management helps other nations prepare and respond to incidents involving WMDs.³⁸

Border and Port Control

Many analysts and law makers have expressed concern that the global shipping container system poses a potential security risk for the United States. The sheer volume of goods transported in shipping containers, whether by land or sea, has presented a challenge for agencies tasked with finding loose nuclear material. Investing in effective and innovative technologies and procedures for scanning and securing containerized cargo must be a priority.

The Department of Homeland Security (DHS) has created a multi-pronged approach to dealing with the threat of loose nukes, whether leaving or entering the U.S. Primarily, it has looked to the U.S.' land and sea borders. DHS works with U.S. Customs and Border Protection (CBP) to deploy radiation detection technologies, such as Radiation Portal Monitors, to seaports, land border ports, and mail facilities across the globe. Today, these systems scan 100 percent of cargo containers and personal vehicles arriving by land, and over 99 percent of containers arriving by sea.³⁹

It has also instituted the Securing the Cities (STC) initiative, a program focused on the highest-risk cities for a nuclear attack. As part of this program, "3,000 personnel in the New York City region have been trained in preventive radiological and nuclear detection operations and nearly 8,500 pieces of radiological detection equipment have been funded," making it appear to be a fairly effective method of strengthening national security against a potentially devastating attack.⁴⁰

Protecting our borders and ports goes beyond just those at home, and the U.S. has made investments in detecting threats before they reach our shores. For instance, the 2003 Megaports Initiative seeks to equip 100 seaports worldwide with equipment for detecting nuclear materials and scan 50% of containerized cargo by 2015.⁴¹ It is led by the NNSA and incorporates assistance from the Departments of State and Homeland Security.⁴² However, in FY13, funding for Megaports was slashed by 85%, as installations were completed at "higher-priority" facilities and questions about program effectiveness and overlap arose.⁴³

The Pentagon

While many of the measures looked at in this paper explore methods of preventing loose nukes, the Pentagon is examining strategies for the unlikely but possible situation that a loose nuke falls into the wrong hands. The Pentagon proposes "improving domestic defense arrangements, collaborating with intelligence agencies to bolster assessment and monitoring of extremist groups, spotting probable means by which sensitive materials could spread, and strengthening the system for evaluating the origin and details of possible nuclear dangers."⁴⁴ While the military recognizes that this event is unlikely, they have in part reacted due to President Obama's Administration calling for further progress in securing loose nukes.

Policy Actions on Preventing Nuclear Terrorism

Efforts to prevent nuclear terror have traditionally had broad bipartisan support among policymakers. It is important that this support continues.

Various ideas and proposals have been submitted to Congress and the administration to further enhance nuclear security. The common theme among these is increased spending, but this has not always come to

fruition. For example, the Baker-Cutler report, released in 2001, argued that the U.S. should spend \$30 billion on DOE's efforts until 2011. Instead, it spent around \$10 billion, or about \$1 billion a year.⁴⁵

Another possibility to follow through on the Prague Speech's declaration to secure all loose nuclear material is to divert spending from other programs which are either no longer vital or have succeeded in their goals. To achieve this, Congress would have to redistribute funds from former Soviet nonproliferation programs and focus the money instead on preventing nuclear proliferation in the Middle East and Asia.⁴⁶

Ultimately, increasing funding alone will not be enough to secure all nuclear materials. An interagency coordinating body for anti-proliferation efforts, which also coordinates with international partners and mechanisms, could benefit the overall goal. This body would serve to not only make sure that all programs are on the same page and reduce overlap, but periodically review, adjust, and modernize their frameworks alongside the international partners which are involved. It could also serve to better connect proliferation intelligence to action which is intended to eliminate or reduce those risks.

Making the case for creating an agency specifically assigned to undertake and coordinate non-proliferation efforts comes in the 17-year effort to secure hundreds of pounds of plutonium in Kazakhstan.⁴⁷ While ultimately successful, a 17-year period to completely secure a potential proliferation site is an inexcusably dangerous amount of time for a known problem to exist, regardless of the international circumstances surrounding the situation.

There is no doubt that loose nukes present a real danger in the hands of terrorist organizations. Policymakers must adapt to global changes and reconfigure nonproliferation programs to better address this danger. The Soviet Union's nuclear weapons, now under the custody of Russia, are not nearly the same threat as a nuclear weapon in terrorist hands. Funding, focus, and direction should be readjusted to adapt the nature of current threats.



The NNSA Removes last remaining highly enriched uranium from the Czech Republic. NNSA Photo.

Recommendations

- Create an inter-agency coordinating body specifically tasked with addressing proliferation issues and ensuring program effectiveness.
- Increase work with partners overseas to monitor and prevent proliferation risks.
- Develop a national strategy for responding to nuclear-related attacks, both domestically and internationally.
- Ensure effective counter-proliferation programs are properly resourced.

Ratifying the Comprehensive Test Ban Treaty

“The over 1,000 nuclear tests conducted by the United States have given our country an amount of data, knowledge, and expertise which far surpasses any other country in the world. We have nothing to gain, and much more to lose by resuming nuclear testing in the future.”

–BGen. John Adams, USA (Ret)

Key points

- Resumed explosive nuclear testing would prove harmful to national security as other nations would resume their testing in order to catch up with U.S. nuclear capabilities.
- The Treaty’s 1999 failure in the Senate was the result of a hurried vote without proper information or preparation.
- Stockpile Stewardship has provided the U.S. with an effective method of non-explosive nuclear testing.
- The U.S. has maintained a de facto moratorium on testing for over 20 years.

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) is a legally binding global ban on nuclear explosive testing and the final step in the vision laid out fifty years ago by President John F. Kennedy.⁴⁸ The CTBT was opened for signature in 1996. The U.S. is a signatory to the Treaty, but did not ratify it during a hurried Senate vote in 1999.

The treaty is set to enter into force after it is ratified by all 44 “Annex 2” states. Of these 44 states, eight have not yet ratified, including the United States, Egypt, Iran, Pakistan, India, North Korea, China, and Bangladesh.⁴⁹

Though the U.S. has not ratified the treaty, in practice, it has adhered to its principles for over 20 years. Since 1992, under President George H.W. Bush, the United States has observed a unilateral moratorium on nuclear explosive testing. This moratorium was originally established as a nine-month period under the Exon-Hatfield-Mitchell Amendment to the FY 1993 Energy and Water Appropriation Bill. The amendment also provided for the option to explosively test up to 12 nuclear weapons in an effort to improve reliability prior to the stated goal of negotiating a comprehensive test ban.⁵⁰ Those tests were never conducted.

Why the U.S. Should Ratify

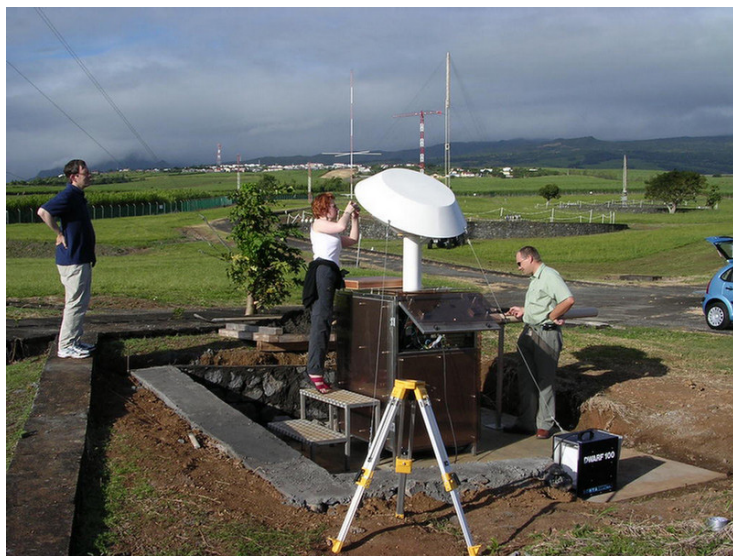
A lot has changed since the 1999 vote, warranting another look at ratification. Our ability to verify the Treaty is now well established and the information the U.S. gains by joining the treaty benefits national security.

Technological advances and new science has made it possible to pinpoint and accurately determine the size and scope of a nuclear explosion. The CTBT’s network of 278 currently certified sensors is designed to detect “any nuclear explosion conducted on earth,”⁵¹ and is a vital tool that the U.S. can use to monitor rogue states that are not deterred by the U.S. triad of strategic nuclear weapons. In recent years, we have seen this detection

technology used when the then-limited network of CTBTO seismic sensors provided data about the North Korean Nuclear tests in 2006 and 2009.⁵² This same system also provided data about the 2013 meteor strike in Russia.⁵³

Aside from the technological monitoring, the Comprehensive Test Ban Treaty also gives the U.S. access to on-site inspections designed to conclusively determine whether or not a nuclear test has taken place.⁵⁴ These short notice inspections require that inspectors be allowed into a country within six days of filing notice.⁵⁵

Further cementing the case for ratifying the CTBT, the U.S. simply no longer requires the ability to explosively test its nuclear weapons. Having conducted over 1,030 independent explosive tests since 1945, the U.S. retains a significant advantage over other countries in nuclear testing. This amount is greater than the number of tests performed by all other countries in the world combined.⁵⁶ If the U.S. were to restart explosive nuclear testing, it would set a hazardous precedent for a renewed nuclear arms race that would prove harmful to its national security.



Installation of CTBT nuclear detection equipment. Image courtesy: CTBTO.

potentially usable to terrorist groups. Additionally, warhead miniaturization physically permits adding additional warheads to a missile, and also enables a smaller warhead to be delivered farther on existing missile technology due to the decreased payload weight. Without the ability to explosively test, other nations will find making these advances exceedingly difficult.

Essentially, universal adherence to the CTBT hinders other states from advancing their nuclear weapons knowledge and experience. The U.S. should therefore commit to the world that it will never conduct nuclear explosive tests again, as its ratification of the CTBT is mandatory for the treaty to go into effect.

Once the treaty is in effect, adherence to its provisions will provide a rallying point around which a case for action against treaty violators can be formed. This could increase U.S. national security by aiding in the formation of international coalitions against any violators, and gives the U.S. a better ability to employ existing international security mechanisms to their full effect.

Further cementing the case for ratification of the CTBT, the U.S. has maintained a moratorium on explosive

In response to U.S. explosive testing, other countries would likely resume their tests, either for political or technical purposes. The U.S. advantage in knowledge gained from its extensive explosive testing history would slowly evaporate as other countries worked to catch up. In particular, countries with small, unsophisticated stockpiles would use this opportunity to explosively test in order to make technical improvements in areas such as warhead yield⁵⁷ and miniaturization.⁵⁸

While advances in warhead yield increase the destructive power of nuclear weapons, the advantages of miniaturization are of even more concern. Miniaturization could potentially allow nuclear devices to be more concealable, rendering them even more appealing and

nuclear testing since 1992. This is based on the national security assessment that the United States does not need to conduct nuclear explosive tests in order to ensure the safety, security and effectiveness of the nuclear forces⁵⁹ it maintains to deter nuclear attacks on itself, its allies and its partners.

Illustrating this, the Stockpile Stewardship and Management Program, which performs maintenance and verifies the reliability of the U.S. nuclear arsenal without explosive testing, is a proven system. Scientific and technological advancements have provided the U.S. with the highest level of knowledge and capability for maintaining a safe, secure and reliable deterrent in its history.⁶⁰ Explosive testing is simply no longer necessary, and the U.S. would gain no more beneficial knowledge from doing so.



A B61 nuclear weapon undergoing testing as part of the stockpile stewardship program. NNSA Picture.

America's two-decade refrain from explosive testing is an indicator that such nuclear testing holds no benefit to U.S. national security. If the U.S. does not want to see other countries conduct explosive nuclear testing, it has a responsibility demonstrate its own commitment by internationally codifying its already-existing national moratorium. America must demonstrate leadership on this issue, and so far, it is lagging behind.

Ultimately, there is no compelling argument against ratifying this treaty. CTBT ratification would create a legally binding prohibition on nuclear explosive tests for all member states and will hinder states that do not have nuclear weapons expertise and experience from advancing their nuclear weapons capabilities. At the same time, CTBT ratification will not affect the ability of the United States to maintain a strong nuclear deterrent.

Recommendations

- Continue the moratorium on explosive nuclear testing.
- Do not provide other countries with an excuse to begin the explosive testing they need to improve their nuclear capabilities.
- Continue support for the electronic verification of U.S. nuclear reliability.
- Ratify the Comprehensive Test Ban Treaty.

The Role of Lawmakers and the Media

“History’s most destructive and dangerous weapons deserve an appropriate level of scrutiny. We must ask the tough questions, and make thorough and serious analysis of whether these weapons still serve the purpose they once did.”

–Terri Lodge, ASP Director of Nuclear Security

Key Points

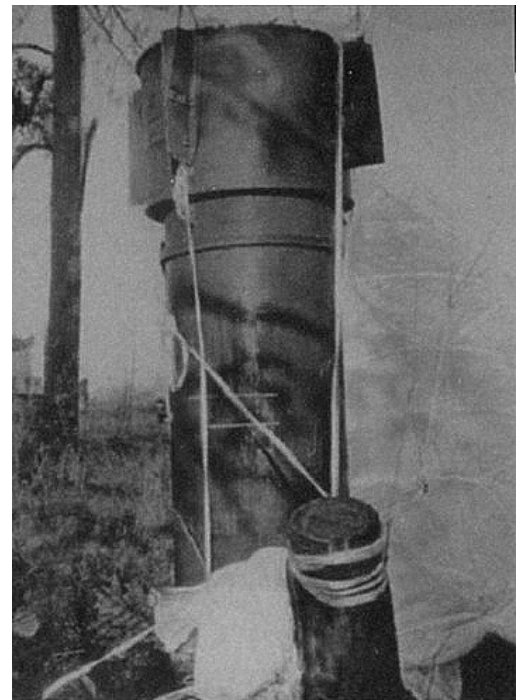
- Nuclear weapons have largely escaped the scrutiny applied to other weapons systems.
- The stakes involved warrant greater media and Congressional attention.
- Nuclear weapons are too deadly, too often mishandled, too expensive, and too much of a terrorism risk to ignore.

A variety of weapon systems and platforms in past decades have come under a great deal of scrutiny for production costs, reliability, or utility. However, nuclear weapons have largely escaped this level of attention. The high cost and low utility of nuclear systems should also make them central to any debate about the federal budget.

The seriousness of nuclear weapons alone warrants greater attention from Congress and the media. Despite this, there has neither been enough serious debate in Congress nor coverage in the media about the role of these weapons and whether they still provide the strategic deterrence they used to, given the changing nature of the international system.

Over a one-year period beginning October 1, 2012, the top 20 print newspapers by circulation in the United States published a total of only 18 news articles directly focused on U.S. nuclear weapons and budget.⁶¹ During the same period, ASP identified six Congressional hearings specifically focused on the nuclear deterrent and its budget.⁶² This lack of significant attention demonstrates that nuclear weapons have not been subject to the scrutiny they warrant.

The bottom line is this: nuclear weapons are too deadly, too often mishandled, too expensive, and too much of a terrorism risk to ignore.



A nuclear weapon which nearly detonated in the 1961 Goldsboro crash.

Congressional Hearings FY 13

Title	Committee	Date
The U.S. Nuclear Deterrent: What are the Requirements for a Strong Deterrent in an Era of Defense Sequester?	House Armed Services Committee/ Strategic Forces Subcommittee	March 19, 2013
Fiscal Year 2014 Budget Request for Atomic Energy Defense Activities and Nuclear Forces Programs	House Armed Services Committee/ Strategic Forces Subcommittee	May 9, 2013
Budget Hearing – National Nuclear Security Administration Weapons Activities	House Appropriations Committee/ Energy and Water Development and Related Agencies Subcommittee	February 14, 2013
FY-14 Senate NNSA Budget Hearing	Senate Appropriations Committee/ Subcommittee on Energy and Water Development	April 24, 2013
Oversight: Testimony on Nuclear Forces and Policies	Senate Armed Services Committee/ Subcommittee on Strategic Forces	April 17, 2013
Oversight: Strategic Forces Programs of the National Nuclear Security Administration and the Department of Energy's Office of Environmental Management	Senate Armed Services Committee/ Subcommittee on Strategic Forces	May 8, 2013

Too Deadly

No one underestimates the deadly potential of nuclear weapons. Demonstrated in definitive clarity in 1945, the nuclear weapons of today dwarf the power of those seen nearly 70 years ago. A 2006 RAND study estimated the cost in lives from a ten kiloton nuclear detonation (smaller than both the bombs detonated over Japan) at the Port of Long Beach at 60,000.⁶³ It is because of the exceptionally deadly and destructive nature of nuclear weapons that issues surrounding them deserve exceptional attention.

Though the threat of nuclear retaliation arguably prevented open conflict between the U.S. and the Soviet Union throughout the Cold War, the barriers to their use by countries or parties who feel unbound by

international norms are less evident. The consequences of such use are simply too high to ignore.

Too Often Mishandled

Given the gravity and consequences of a nuclear strike of any sort, the margin of error for handling nuclear weapons *must always* be zero. Despite this, the number of mishaps or accidents over the course of America's nuclear weapons history is disturbing.

For instance, mishaps and accidents during the Cold War resulted in the U.S. losing and never recovering 11 nuclear weapons.⁶⁴ Though the capability for another party being able to retrieve any of these missing weapons is infinitesimally small, the notion that any U.S. nuclear weapons have ever been lost is unsettling.

But “mishandling” includes more than literally “dropping” a bomb while transporting or loading (it should be noted there has never been an accidental detonation in such incidents)—it also includes the process by which nuclear weapons and materials are secured, identified, transported or otherwise kept track of. Breaches of nuclear facilities,⁶⁵ loading them onto aircraft without the crew realizing it, and nuclear surety failures are all things that must never be allowed to happen—but they do. If these errors are occurring in the United States of America, the prospect of what may be occurring overseas is even more frightening.

Too Expensive

Spending money on weapons that are unacceptable to use directly takes away from spending on the weapons and equipment American troops actually need.

The cost of these weapons individually is significant. For instance, the cost of the life extension program for the B61 nuclear bomb is estimated at \$10 billion.⁶⁶ This equates to an estimated \$28 million per bomb.⁶⁷ A replacement for the Ohio-class submarines, which currently carry much of the U.S. nuclear arsenal at sea, is estimated to have a total acquisition cost of \$93 billion.⁶⁸ The numbers for these weapon systems and platforms are significant, and warrant serious consideration as to the utility of these systems in the overall national security framework.

A major consideration for lawmakers and the media is whether this funding is better spent towards equipping our troops with the equipment, weapons, and support they can actually use. But the real question is whether the vast amount of money spent on these weapons to provide a deterrent against a nuclear attack actually accomplishes this goal—especially against a rogue state or terrorist group.



USS Louisiana, an Ohio-class submarine. U.S. Navy Photo

Too Much of a Terrorism Risk

The detonation of a nuclear weapon or a nuclear-laced “dirty bomb” on U.S. territory or overseas by a terrorist group would have global consequences too grave to ignore. Aside from the potentially horrific loss of life, the psychological impact such a detonation would have on the world’s financial system fundamentally requires action to address the risk.

We know that loose nuclear material has been caught on the black market. We know that it took 17 years to secure unguarded material in Kazakhstan. We know that proliferation of knowledge and technology has enabled rogue nuclear states to develop nuclear programs of their own. And we know that terror groups would love to get their hands on a nuclear weapon.

Today, the actions of inside individuals have the potential to harm America’s nuclear security. In the age of Wikileaks and Edward Snowden, the damage that can be done by internal or external actors with access to secure or classified material has become alarmingly clear. These recent electronic security violations should justifiably raise concerns about who has access to nuclear weapons, material, or information. While the NNSA has an Office of Defense Nuclear Security and has instituted a Zero-Based Security Review,⁶⁹ it is unclear whether these elements are sufficient.



A monument commemorating efforts to secure unguarded nuclear materials at Delegen Mountain, Kazakhstan. DoD Photo.

As a result of all this knowledge, we know we must engage in activities and create policies designed to tackle this threat. Lawmakers have a responsibility to support this, and the media has a responsibility to hold them to task when efforts fall short.

Recommendations

- The media should cover nuclear issues with the breadth and seriousness that the nature of these weapons commands.
- Lawmakers should intensely scrutinize nuclear programs and funding issues to determine their utility and cost to the nation.
- International treaties and regulations concerning nuclear policies should be afforded full and honest debate on the Senate floor.
- Mandate a classified, regular full-spectrum review of physical and electronic vulnerabilities designed to eliminate risks posed by internal or external actors.

Recommendations

1. A 21st Century Nuclear Deterrent

- a. Institute a three-tier nuclear deterrent strategy for addressing those actors still deterred by MAD, and those that are not.
- b. Develop effective non-nuclear deterrence options against those states and actors not deterred by the U.S. nuclear arsenal.
- c. Seriously consider confidence-building measures to reassure states that are suspicious about U.S. de-nuclearization efforts.

2. Rightsizing our Nuclear Force

- a. Conduct a full review of the triad, its effectiveness, and whether all three legs are necessary for maintaining the strength of the U.S. deterrent.
- b. Reduce the deployed stockpile to a level lower than 1,000 warheads.
- c. Conduct a review of nuclear security policies and measures to reduce the error rate to zero.

3. Proliferation and Terrorism

- a. Create an inter-agency coordinating body specifically tasked with addressing proliferation issues and ensuring program effectiveness.
- b. Increase work with partners overseas to monitor and prevent proliferation risks.
- c. Develop a national strategy for responding to nuclear-related attacks, both domestically and internationally.
- d. Ensure effective counter-proliferation programs are properly resourced.

4. Ratifying the Comprehensive Test Ban Treaty

- a. Continue the moratorium on explosive nuclear testing.
- b. Do not provide other countries with an excuse to begin the explosive testing they need to improve their nuclear capabilities.
- c. Continue support for the electronic verification of U.S. nuclear reliability.
- d. Ratify the Comprehensive Test Ban Treaty.

5. The Role of Lawmakers and the Media

- a. The media should cover nuclear issues with the breadth and seriousness the nature of these weapons commands.
- b. Lawmakers should intensely scrutinize nuclear programs and funding issues to determine their utility and cost to the nation.
- c. International treaties and regulations concerning nuclear policies should be afforded full and honest debate on the Senate floor.
- d. Mandate a classified, regular, full-spectrum review of physical and electronic vulnerabilities designed to eliminate risks posed by internal or external actors.

Conclusion

Nuclear weapons have been a bulwark of the U.S. national security strategy for nearly seven decades. The thinking surrounding the employment of these weapons is nearly as old. The international system has changed greatly since that time, and consequently, America's nuclear strategy must change to adapt to this new system or risk fading into ineffectiveness and irrelevancy.

Massive arsenals of politically unusable weapons simply no longer fit the deterrent needs of the United States—and the size of the U.S. arsenal is an irrelevant factor in deterring proliferation. Therefore, U.S. national security is better served by diverting resources toward strategies, weapons, and equipment that are designed to address the challenges it faces today.

To move toward a new effective strategy, the U.S. should develop a three-tiered strategy for deterrence; reduce the size of its nuclear arsenal; reanalyze and better coordinate its counter-proliferation efforts; and ratify the Comprehensive Test Ban Treaty. Lawmakers and the media should address these issues with the breadth and seriousness they deserve.

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About the Author

Matthew Wallin is a fellow at the American Security Project specializing in public diplomacy, military history, nuclear security, and international conflict. Originally from Los Angeles, Matthew completed his Master's in Public Diplomacy from the University of Southern California in 2010. He is a WWII "living historian," professional photographer, and member of the Public Diplomacy Council.

Follow him on twitter @MatthewRWallin



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The American Security Project (ASP) is a nonpartisan organization created to educate the American public and the world about the changing nature of national security in the 21st Century.

Gone are the days when a nation's security could be measured by bombers and battleships. Security in this new era requires harnessing all of America's strengths: the force of our diplomacy; the might of our military; the vigor and competitiveness of our economy; and the power of our ideals.

We believe that America must lead in the pursuit of our common goals and shared security. We must confront international challenges with our partners and with all the tools at our disposal and address emerging problems before they become security crises. And to do this we must forge a bipartisan consensus here at home.

ASP brings together prominent American business leaders, former members of Congress, retired military flag officers, and prominent former government officials. ASP conducts research on a broad range of issues and engages and empowers the American public by taking its findings directly to them via events, traditional & new media, meetings, and publications.

We live in a time when the threats to our security are as complex and diverse as terrorism, nuclear proliferation, climate change, energy challenges, and our economic wellbeing. Partisan bickering and age old solutions simply won't solve our problems. America – and the world - needs an honest dialogue about security that is as robust as it is realistic.

ASP exists to promote that dialogue, to forge that consensus, and to spur constructive action so that America meets the challenges to its security while seizing the opportunities that abound.



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