

REVITALIZING THE NUCLEAR WEAPONS ENTERPRISE

BY

LIEUTENANT COLONEL DIRK E. PLANTE
United States Army

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U.S. Army War College, Carlisle Barracks, PA 17013-5050

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by

Lieutenant Colonel Dirk E. Plante
United States Army

Colonel Jeffrey L. Caton
Project Adviser

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U.S. Army War College
CARLISLE BARRACKS, PENNSYLVANIA 17013

ABSTRACT

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The quantity and role of the United States' nuclear weapons arsenal has evolved, and national security strategy documents continue to maintain unambiguous language regarding this role. However, the current state of the nuclear weapons enterprise can be described as disconnected from the security environment for which it is designed to serve as a strategic deterrence. Actions by the nation that have contributed to the current state include the testing moratorium, the ban on weapons research and development, the reduced emphasis on nuclear training and education in the military, and the degradation of nuclear infrastructure. There is tremendous opportunity ahead for revitalizing the enterprise, but only if the nation makes the commitment to change. The commitment must include modernizing our nuclear force and recapitalizing our nuclear infrastructure, while eliminating excessive weapons and delivery systems, and increasing the nuclear weapons knowledge in the services.

REVITALIZING THE NUCLEAR WEAPONS ENTERPRISE

The quantity and role of the United States' nuclear weapons arsenal has evolved to meet an ever changing global threat. At the height of the Cold War, the United States managed a significant operationally deployed stockpile, amassing into the tens of thousands. Today the arsenal is less than five thousand, and it will continue to get smaller to meet current and projected agreements or treaty obligations. The reduction in weapons, while to be celebrated with the ending of the Cold War and reducing of tensions among nuclear-armed states, has resulted in a reduced focus on the nuclear weapons enterprise. The enterprise includes the weapons, the Department of Defense (DoD) personnel and forces that oversee and control the operational stockpile, as well as the nuclear weapons complex needed to produce, maintain and dismantle those weapons. The manifestation of this reduced attention has been an increase of incidents involving nuclear forces that required a DoD task force on nuclear weapons management to remind us that:

Throughout the Cold War, the uniqueness and power of nuclear weapons were largely understood. With the end of the Cold War, and the sharply reduced likelihood of a nuclear exchange, awareness of the role and the power of nuclear weapons has diminished. But their power and uniqueness endure – and must again be clearly understood if they are to play their crucial role in nuclear deterrence.¹

Nuclear weapons will continue to have a part in our nation's defense in the foreseeable future. Our national security strategy documents continue to maintain unambiguous language regarding this role. The 2006 National Security Strategy points out that "safe, credible, and reliable nuclear weapons continue to play a critical role"² in providing security commitments to our allies and deterring "the new threats we face."³ The 2006 National Military Strategy to Combat Weapons of Mass Destruction (WMD), in

addressing the full range of operational capabilities the military must possess, states for offensive operations that nuclear weapons (as well as non-nuclear weapons) can be employed to “deter or defeat a WMD threat.”⁴ Other recent national strategic documents, including the 2010 Quadrennial Defense Review, state much the same.⁵

This paper begins with a brief history of the nation’s weapons, and then explores the United States’ nuclear weapons enterprise, how it evolved to and why the current state is unacceptable. Actions that have contributed to the current state include the weapons testing moratorium, the ban on weapons research and development, the reduced emphasis on nuclear training and education in the military, and the degradation of nuclear infrastructure. Two case studies are then presented that provide specific highlights of failures to maintain a robust enterprise. The paper concludes with recommendations for changes to the nuclear weapons enterprise that will ensure America maintains an arsenal and supporting infrastructure capable of meeting future threats to our nation.

Brief History of America’s Nuclear Weapons

At the end of World War II America had a monopoly on nuclear weapons. The nation’s nuclear weapons inventory stood at a tenuous two in July 1945. Those two weapons would be used to end the war a month later.⁶ The use of the second atomic bomb temporarily depleted the inventory, which lasted for only one month. Soon, a steady supply of weapons grade plutonium became available to start the buildup of the nation’s nuclear weapons stockpile. The United States’ monopoly on weapons would only last four years. In August 1949 the Soviet Union tested their first weapon, which due to espionage at U.S. laboratories was an exact copy of the Fat Man weapon used against Nagasaki, Japan.⁷

During the Cold War the nuclear enterprise produced increasingly complex but safer designs. These weapon advancements included improvements in arming and fusing, pit, boosted fission primary, and fusion secondary designs.⁸ These state-of-the-art advancements resulted in smaller yet more powerful weapons that could be deployed on a variety of delivery vehicles: intermediate range missiles, land and submarine-based intercontinental ballistic missiles (ICBMs), gravity bombs, cruise missiles, artillery shells and even man-deployable weapons. The assortment of weapons was only limited by how the services saw their role in employing them. At the height of the Cold War the inventory grew to more than 30,000 warheads.

Today the nation's inventory stands at less than 5,000 operationally deployed weapons and will be less than 2,000 when the Strategic Offensive Reduction Talks (SORT), or Moscow Agreement of May 2002, is implemented by 2012. However, the Strategic Arms Reduction Treaty (START) expired in December 2009, and its replacement agreement with Russia, though still being negotiated, is expected to cut the number of warheads below the SORT level. This will commit "the United States and Russia to reduce their strategic warheads to a range of 1,500-1,675 warheads and their strategic delivery vehicles to a range of 500-1,100."⁹

The Current State of the Nuclear Enterprise

The current state of the enterprise can be described as disconnected from the security environment for which it is designed to serve as a deterrent. No new weapon has entered the inventory since 1989, and no nuclear test has been conducted in the last 17 years. Today's nuclear arsenal contains nine distinct weapons, with yields ranging from a few kilotons to just over one megaton.¹⁰ In general, the country's inventory contains several weapon types that are either redundant or simply too large in

their firepower to warrant serious consideration of their continued use. With yields ranging from hundreds of to more than a thousand kilotons, these weapons were designed to hold at risk cities, industrial complexes, and large military formations of the former Soviet Union and Warsaw Pact nations. Today's security environment, as expressed in the most recent National Security Strategy is different.

The United States is in the early years of a long struggle, similar to what our country faced in the early years of the Cold War. The 20th century witnessed the triumph of freedom over the threats of fascism and communism. Yet a new totalitarian ideology now threatens, an ideology grounded not in secular philosophy but in the perversion of a proud religion. Its content may be different from the ideologies of the last century, but its means are similar: intolerance, murder, terror, enslavement, and repression.¹¹

Soon after the last weapon was tested the nation also restricted the development of any new weapons. These changes, and more, were examples of the peace dividend the nation rightfully expected as a result of the defeat of the Soviet Union in the Cold War. As recounted in the official history of Strategic Command, "[t]he end of the Cold War and two sets of Presidential Nuclear Initiatives had already greatly reduced all three legs of the Triad and eliminated new forces projected for the future."¹² However, what followed was the erosion of an emphasis on the importance of maintaining a nuclear weapons enterprise; an emphasis that needed to demand no tolerance for errors. Unfortunately, the result was a series of mishaps with potentially serious consequences, which highlight the need to revitalize the enterprise.

The Demise of the Nuclear Weapons Enterprise

The end of the Cold War saw a dramatic shift in activities the nation undertook (or failed to take) regarding nuclear weapons. The actions that have contributed the most to our current conditions are the testing moratorium and the ban on further

weapons development. Additionally, the manning of our services with nuclear trained personnel, and the neglect of the nuclear infrastructure have contributed to the overall atrophy of the nuclear enterprise. Finally, the national leadership's failure to recognize and address the withering nuclear enterprise actually contributed to it. Each of these five actions is discussed below.

Moratorium on Testing. During the Cold War the nation conducted more than 1,000 nuclear weapons tests,¹³ conducting its last nuclear weapons test on September 23, 1992.¹⁴ Later that year President George H.W. Bush announced a pause in further United States weapons development, including new nuclear warheads, and Congress mandated a freeze on weapons testing.¹⁵ The testing and weapons development bans are still in effect today, reinforced by Executive Orders and legislation in the succeeding administrations and Congress.

The current testing moratorium was essentially a self-imposed restraint, as the United States was under no treaty obligation to stop testing weapons.¹⁶ On October 2, 1992 President Bush signed the Appropriations Act to fund the Department of Energy (DOE), which included language mandating a nine-month moratorium on all U.S. underground nuclear tests.¹⁷ The moratorium was seen at the time as an effort by the administration to improve the probability of negotiating and signing the Comprehensive Test Ban Treaty (CTBT).¹⁸ In July 1993, President Clinton extended the ban another 15 months with the hope of implementing a permanent ban.¹⁹ However, the nation's good intentions to end testing to improve the likelihood of getting a CTBT went unnoticed by others in the "nuclear club." Since 1992 some of the declared nuclear states under the Nuclear Nonproliferation Treaty of 1970, and all of the new nuclear states in the interim

have conducted tests: China (1996), France (1996), India (1998), Pakistan (1998), and North Korea (2008).

The concern that the nation may not have the ability to maintain confidence in the stockpile without conducting nuclear weapons testing has been known and publicized for nearly a decade. The 2001 Nuclear Posture Review pointed out the need to reconsider testing of the stockpile from time-to-time:

While the United States is making every effort to maintain the stockpile without additional nuclear testing, this may not be possible for the indefinite future. Some problems in the stockpile due to aging and manufacturing defects have already been identified. Increasingly, objective judgments about capability in a non-testing environment will become far more difficult. Each year the DoD and DOE will reassess the need to resume nuclear testing and will make recommendations to the President. Nuclear nations have a responsibility to assure the safety and reliability of their own nuclear weapons.²⁰

Could the United States' testing program have benefited from a less-restrictive testing ban? For example, had President George H.W. Bush stated that the United States would discontinue weapons development for only the foreseeable future, and the Congress agreed to similar language in 1993 when they legislated the halt to U.S. nuclear tests, the country could have given itself the opportunity to resume warhead development and weapons testing should world conditions change. That is exactly what has happened in the intervening 17 plus years. As it is now, the nation has put itself in a no-win situation: Face potential condemnation by the international community should it choose to develop new warheads and resume testing, or face the risk inherent in maintaining an aging stockpile without testing.

Halt to Weapons Design and Development. No new weapons have entered the inventory since the W-88 warhead on the Navy's Trident D-5 missiles in 1989, and the B-83 gravity bombs carried by Air Force bombers in 1983.²¹ The decision to no longer

development new weapons meant that the nation would at some time in the future need to take steps to maintain an aging stockpile. Today, the nation relies on the Stockpile Stewardship Program (SSP) and the Life Extension Program (LEP) to ensure the safety, security and reliability of the weapons in the arsenal.

Under the Clinton administration, the Department of Energy (DOE) established the SSP to: (1) increase understanding of managing an enduring/aging stockpile, (2) predict and understand problems of an aging stockpile, (3) refurbish weapons and components, and (4) sustain the knowledge necessary to maintain the nation's nuclear deterrent.²² However, in 2005 the nation's three weapons laboratories released a report voicing concerns with the continued reliance on SSP: "As these warheads continue to age and are refurbished, an accumulation of small changes could lead to increased risk or increased uncertainty in warhead certification."²³ Thus, the program that is designed to ensure an aging stockpile remains reliable appears to possibly be ineffective instead.

Counter arguments have been made by arms control advocates that the nation's current weapons can endure under SSP, but ultimately simple nuclear physics will ultimately prevail. Due to the unstoppable radioactive decay of the nuclear fuel inside the weapons, "[i]ndependent advisors to the U.S. Department of Energy have suggested an eighty-five year lifetime for "a majority of pits" within properly maintained U.S. nuclear weapons."²⁴ Although eighty-five years is a substantial period, for those weapons built in the 1980's (and even earlier for some warheads), they are approaching 25% of that life span.

The Lifetime Extension Program is expected to ensure that our stockpile remains a credible deterrent in the absence of new weapons development by properly

maintaining the stockpile, and extending the weapon's life by 20 to 30 years. To date, two weapon systems have completed an LEP and another is undergoing an LEP. The W87 warhead was the first to undergo an LEP, with the first weapon completed in 1999 and the last weapon returned to the stockpile in 2004.²⁵ The B61 gravity bomb LEP "extended the life of the B61 Mods 7 and 11 for an additional 20 years by refurbishing the canned subassembly and replacing the associated seals, foam supports, cables and connectors, washers, o-rings, and limited life components,"²⁶ and the currently ongoing W76 Trident missile warhead LEP "will extend the life of the W76 warhead, ...for an additional 30 years by refurbishing the nuclear explosive package, the arming, firing, and fusing system, the gas transfer system,... and other miscellaneous parts."²⁷

There may finally be some momentum for the United States to pursue development of new nuclear warheads. The Obama administration is completing negotiations for a successor treaty to the START agreement. There is a significant number of Senators expected to insist that warhead development begin as part of a modernization of the nuclear force, and that modernization be tied to any new agreement being negotiated with Russia. "Without modernization, it's unlikely that Senators will vote for the significant and probably unwise reductions in U.S. nuclear delivery vehicles that Mr. Obama is negotiating with the Russians."²⁸ Clearly it is time to modernize the nuclear weapons arsenal, which contains many weapons with the sole purpose of holding at risk cities in the former Soviet Union.

Lack of Nuclear Knowledge Among Military Leaders. The Report to the Secretary of Defense Task Force on DoD Nuclear Weapons Management ("Schlesinger Task Force") found in its 2008 review of the DoD nuclear mission that there was a

“distressing degree of inattention to the role of nuclear weapons in deterrence among many senior DoD military and civilian leaders,”²⁹ and that “[m]any lack the foundation of experience for understanding nuclear deterrence,..., and its military role – which is to avoid the use of nuclear weapons.”³⁰ This should not come as a surprise to leaders in DoD. The problem was identified initially ten years earlier by the Defense Science Board (DSB) Task Force on Nuclear Deterrence. “The most difficult issue and the one with the most long-term implications is the widespread perception in both the Navy and Air Force that a nuclear forces career is not the highly promising opportunity of the past era.”³¹

Although much can be said about how the services have lessened emphasis on nuclear skills for their younger officers, the true indication of the impact is evident when examining the professional military education of the senior leadership. Their training on nuclear policy, strategy, and effects of nuclear weapons is not extensive during their careers, and it is particularly scant at the senior service colleges.³² In a 2008 report, a DSB Summer Study concluded “...that the core courses of instruction at the war colleges tended to treat nuclear deterrence strategy as a historical artifact.... Minimum time in the core was devoted to developing a strategic understanding of the role for nuclear weapons.”³³ This is the time in an officer’s career when they are expected to think strategically, and yet there is no significant education on nuclear policy and strategy for our best senior leaders. These senior leaders will rise to attain the highest ranks of the military, but will likely not have the knowledge needed to provide military advice to our national leadership on nuclear-related policies and strategies.

The report did offer praise to the Army for maintaining a permanent cadre of officers with knowledge of nuclear weapon effects, something no other service does. The Functional Area 52 (Nuclear and Counter-proliferation) officers serve in assignments from the time they are selected into the functional area as senior captains up to the rank of colonel. However, they are a small cadre of about 250, and serve mostly outside the Department of the Army.³⁴ At the highest levels of the Army, and all the services though, there is now a significant reduction in the number of general and flag officers who have a practical understanding of nuclear weapons policy, strategy, and weapon effects.

Neglect of Nuclear Weapons Infrastructure. During World War II, the United States took less than three years to design, produce, and test a nuclear weapon; this included acquiring the first tracts of land near Oak Ridge, Tennessee in September 1942 for the production of uranium fuel, to successfully detonating a weapon in the desert of New Mexico in July 1945.³⁵ This was an extraordinary achievement of the industrial base and the military to construct, from the ground up, the entire nuclear infrastructure in such a short span. Subsequently, during the Cold War the United States maintained that robust infrastructure, making it possible to maintain an arsenal of more than 30,000 weapons at the stockpile's peak.

Each of the previously discussed concerns (i.e. weapons testing moratorium, ban on weapons research and development, and lack of nuclear knowledge among military leaders) has contributed in its own way to the current neglected state of the nation's nuclear infrastructure. The Schlesinger Task Force found that, "the industrial capability and skills for modernization (to produce nuclear weapons) are in a state of decay."³⁶

However, this degradation of the infrastructure was not a recent phenomenon, as a Rand Corporation study anticipated this deterioration to start less than two years after weapons development and testing ceased:

Budgets and numbers of qualified staff are declining across the board, as they should, but there is a distinct danger that the decline will be managed poorly (by DoD and DOE), with loss of critical capabilities. The current highly decentralized structure is poorly suited to a tightly managed large-scale drawdown.³⁷

Regardless of the size of the nuclear arsenal, the nation must possess a modern nuclear infrastructure capable of maintaining a safe, secure, and reliable stockpile. Today there is a call “for significant investments in a repaired and modernized nuclear weapons infrastructure and added resources for the three national laboratories.”³⁸

Failure of National Leadership. As with all national level decisions, those regarding nuclear policies ebb and flow with each administration depending on how it perceives the current strategic environment and threat. The nation sought a peace dividend at the end of the Cold War, which had a significant impact on nuclear weapons policy. However, ten years after the fall of the Berlin Wall concerns were raised about whether or not America was getting its nuclear policy right. In evaluating the new world order following the defeat of the Soviet Union, Colin Gray, in discussing the need for a second nuclear age, observed, “[w]e know that the USSR lost the Cold War; it is less certain that the United States won.”³⁹

In the absence of a superpower rivalry to dominate our nuclear weapon policies, the national leadership made decisions that took advantage of the reduced tensions with the former Soviet Union at the expense of properly maintaining a deterrence that looked to the future. As a 2008 DSB Summer Study determined, those decisions may not be the best for the country: “The nation has been ignoring for some time the warning

signs that, with respect to nuclear weapons, the “peace dividend” from the end of the Cold War is wearing increasingly thin.”⁴⁰ And that, “many prominent leaders in the United States still hold fast to the belief that no one would dare to use nuclear weapons against our nation. The belief is accompanied by a lack of investment in force modernization.”⁴¹

This thought from the DSB report is reflected in how national leaders handled the decision to stop nuclear testing. The mixed message that the United States Senate Foreign Relations Committee sent when declining to give its advice and consent for the CTBT in 1999 yet still mandate that the nation will not test nuclear weapons is remarkable and ironic. At the time that they voted “no,” many senators expressed their concern with the nation’s ability to verify its nuclear arsenal in the absence of testing.⁴² However that is exactly the current continuing predicament: the government precludes testing, yet does not support a test ban treaty.

As expressed in a recent opinion-editorial article, Vice President Biden stated that only recently is the nuclear weapons enterprise receiving its due attention again. “Among the many challenges our administration inherited was the slow but steady decline in support for our nuclear stockpile and infrastructure, and for our highly trained nuclear work force.”⁴³ Indeed, the President’s Budget for fiscal year 2011 includes an increase in spending on the nuclear force: “At the NNSA [National Nuclear Security Administration], the Obama administration is seeking a funding increase of 25 percent, to \$2 billion, for the continued safety and surety of the nuclear weapons stockpile.”⁴⁴ This additional funding is notable for two reasons: the funding increase is occurring while reductions in the nuclear weapons stockpile are continuing, and the large boost in

funding is coming at a time when fiscal pressures on the budget are demanding smaller increases or none at all for many other discretionary spending programs.

This renewed political interest is not because of a sudden realization that the nuclear weapons enterprise has been quietly, and effectively working in the background and needed renewed attention. Instead, it is due to several recent mishaps, fortunately none of these mishaps resulted in disaster (e.g. the loss, theft or detonation of a nuclear weapon).

The Current State is Unacceptable

Complacency and inaction have taken their toll on the nuclear enterprise. The Schlesinger Task Force found a significant “(a)trophy of the (n)uclear (m)ission” within the Department of Defense (DoD).⁴⁵ This lessening of emphasis on the mission has led to several recent near disasters. That these incidents did not result in disasters is fortunate. That they happened at all is beyond unfortunate; it is intolerable.

Perhaps there was no greater mishap that called attention to the state of the enterprise than the recent unintentional transfer of nuclear weapons across the country, a “Bent Spear” incident.⁴⁶ In August 2007 an Air Force B-52 bomber flew from Minot Air Force Base (AFB), North Dakota to Barksdale AFB, Louisiana to transfer twelve cruise missiles, attached to the wing pylons, to a maintenance unit for decommissioning. What the bomber crew and everyone at Minot AFB failed to realize was that instead of containing dummy warheads, six of the AGM-129 Advanced Cruise Missiles contained actual nuclear weapons.⁴⁷ The firestorm of astonishment has still not been extinguished.

This event was preceded a year earlier by the erroneous shipment of Minuteman III missile parts to Taiwan. The Defense Logistics Agency had shipped four nose cone fuse assemblies for the missiles to Taiwan in August 2006.⁴⁸ The Taiwanese military

was expecting four replacement battery packs for their UH-1 “Huey” helicopter fleet. Taiwan officials stated that they quickly discovered that they had not received batteries, but did not happen to mention that they had received nuclear fuses instead.⁴⁹ More than 18 months passed before the mistake was discovered. “It was not until March 20 (2008), after a series of communications with Taiwan, that Pentagon officials first became aware Taiwan had not simply received the wrong batteries, but classified nuclear weapons components.”⁵⁰ This adds to the real issue of a crisis in the management and leadership of the nation’s nuclear weapons enterprise; a crisis that is the result of an inattentive culture shift on the importance of the nation’s nuclear weapons.

Over the years there have been occurrences of military units failing Nuclear Operational Readiness Inspections (NORI). In assessing the Air Force, the Schlesinger Task Force found a cause for these failures to be the change from no-notice to scheduled inspections: “No-notice inspections have been almost entirely replaced by those carried out according to a published schedule; the result has been a cycle in which each unit rigorously prepares for an inspection, stands down ..., prepares for another ..., and so on.”⁵¹ This carousel of standing up for one inspection, and then standing down until it is time to prepare for the next one can lead to a lack of confidence in the unit’s ability to perform its mission all of the time. For example, the Air Force unit involved in the “Bent Spear” incident in 2007 had passed their NORI about 16 months earlier.⁵² Just recently, following a failed inspection, the Air Force decertified a unit responsible for maintaining the weapons stored at Kirtland AFB in New Mexico. “The Air Force on Jan. 27 decertified the 898th Munitions Squadron at Kirtland Air Force Base,

which maintains an estimated 2,000 nuclear warheads inside a bunkered storage facility.”⁵³

The complacency and inaction that have led to these publicized incidents involving nuclear weapons should be a wake-up call to reinvigorate the enterprise. Before addressing recommendations capable of doing that, two case studies are discussed that attempted to improve but actually damaged the enterprise.

Case Study #1: Role of STRATCOM's Evolution in Degradation of the Enterprise

Among the many actions over the years that brought the United States' nuclear enterprise to its current state, the stand-up of a new United States Strategic Command (USSTRATCOM or STRATCOM) in 2002 is important. The original STRATCOM was formed in 1992. It placed the strategic nuclear forces from each of the services under a single combatant commander with a singular focus: the nation's nuclear weapons. No longer would the Navy and Air Force separately command their strategic forces.

The world now anticipated the end of the threat of nuclear Armageddon and so began the reduction in the priority given to the employment of nuclear weapons. Soon after STRATCOM stood up, the United States made unilateral announcements to cease nuclear weapons testing, and quit research and development efforts on new nuclear warheads. Even though weapons development and testing ceased, the STRATCOM mission still focused on one thing: deterrence, and if deterrence failed, deploy the force.

In 2002, STRATCOM merged with the United States Space Command (USSPACECOM or SPACECOM) in 2002, yet retained the same name, and today is responsible for eight distinct mission sets: Cyberspace; Global Network Operations; Combating Weapons of Mass Destruction; Global Strike (nuclear and non-nuclear options for defeating targets world-wide); Space Operations; Intelligence, Surveillance

and Reconnaissance; Integrated Missile Defense; and Information Operations. Strategic Command was created at the end of the Cold War with a single-minded focus of nuclear weapons. This mission proliferation has resulted in a dilution of the leadership in charge of nuclear weapons. In 2008 the Schlesinger Task Force found:

Prior to the 2002 merger of USSPACECOM and USSTRATCOM, the senior leader with undivided daily focus on the nuclear mission area was the Commander, USSTRATCOM, a four-star general or flag officer. During the Task Force review, the most senior officer at USSTRATCOM with a purely nuclear focus was an Air Force colonel. As a result, the nuclear mission was severely disadvantaged when competing for the attention of the senior leadership within the organization.⁵⁴

When STRATCOM merged with SPACECOM there was a vocal minority that opposed the merger even with the reduced threat of nuclear war and the reduced nuclear inventory. While proponents of a merged combatant command argued that “fewer nuclear weapons and a reduced strategic targeting base after the Cold War do not justify a separate unified command,”⁵⁵ the counter argument by proponents of keeping STRATCOM focused on a singular mission argued “that the devastating nature of such weapons and their residual effects militate in favor of having one officer to whom the President and Secretary of Defense can turn with a single-mission focus on nuclear deterrence and response.”⁵⁶ Given the incredible firepower inherent in nuclear weapons, whether the nation has one weapon or 1,700 weapons, command of the nuclear forces should not be seen as another duty given to a combatant commander with other significant, and quite varied, leadership responsibilities.

Given that today’s STRATCOM places its nuclear mission under the Global Strike mission set, a look at the Air Force response to its recent nuclear mishaps is appropriate. In response to findings from the Schlesinger Task Force and other studies,⁵⁷ the Air Force has stood up the Air Force Global Strike Command (AFGSC).⁵⁸

Their newest major command is led by a Lieutenant General, a significant increase in rank from what the Schlesinger Task Force found during their review of the Air Force nuclear mission.⁵⁹ Unfortunately, the Air Force failed to get it right when designating the leadership of AFGSC. Having a three-star general in charge of the major command responsible for nuclear weapons when four-star generals lead most of the other major commands (e.g. Air Combat Command, Air Mobility Command, Air Force Material Command, and Air Education and Training Command) sends a wrong message of where the nuclear enterprise ranks in priority for the Air Force.

Rank of leadership aside, there certainly is a significantly positive aspect to the formation of the new command. The AFGSC will focus solely on the nuclear mission, as noted in their mission statement: “Develop and provide combat-ready forces for nuclear deterrence and global strike operations... to support the President of the United States and combatant commanders.”⁶⁰

Case Study #2: Role of Two Services with an ICBM Force

Today, we have two services responsible for the delivery of nuclear weapons: the Air Force and the Navy.⁶¹ In assigning nuclear missions and dividing the nuclear stockpile, we have not necessarily taken the best interests of the nation into account. What some may see as healthy competition for the services, upon further inspection it can look more like unnecessary redundancy at the expense of limited personnel and budgetary resources. Essentially, it is seen as service parochialism.

Both the Navy and the Air Force maintain nuclear-tipped missiles. Having each service maintain two distinct missile fleets (i.e. Trident for the Navy and Minuteman III for the Air Force) is not where the redundancy is needed for maintaining a credible nuclear deterrence. Rather, the redundancy should come from having multiple missiles

and multiple warheads, either in land-based missile silos or aboard nuclear submarines, able to respond to the same target.

If the entire U.S. stockpile based on a post-START agreement, which is expected to be less than 1,700 weapons, were only the W76 warheads sitting atop Trident D5 missiles, and no Air Force missiles, the nation would run out of the W76 warheads before it ran out of Trident missiles on which to put them.⁶² The Triad of land, air and sea-delivered weapons was originally developed to accommodate each of the service's desire to have weapons.⁶³ That we still have two distinct missile systems, when the nation plans to keep less than 1,700 total warheads operationally deployed under the proposed follow-on agreement to START, is wasteful and stresses already limited resources.

There is an additional concern for the Air Force about whether or not they give their missile force the priority it needs. Among the many observations recorded by the Schlesinger Task Force in its report on the Air Force's Nuclear Mission, perhaps this is the most telling: "No one explains to junior Air Force personnel why ICBMs are important."⁶⁴ The concern is that the Air Force has let the missile force become a dying career field not worth serving in.

Recommendations for the Way Ahead

The nuclear weapons enterprise must better match the current and future security environment. To do that the nation must commit itself to revitalizing the nuclear weapons enterprise by modernizing nuclear weapons, re-growing the nuclear expertise in the military, and recapitalizing the nuclear weapons infrastructure.

In the current era of constrained budgets the pressure on discretionary spending is starting to squeeze the Defense Department's budget. There is significant direct and

indirect savings that can be achieved from reducing the nation's stockpile while also modernizing it. These reductions will come from treaty obligations mainly, and can come from a smart basing strategy as well. Given the increased survivability of submarine basing over land-based missiles and bomber-delivered weapons, the United States should look to reduce most, and possibly eliminate some, of the weapons in the inventory that are not submarine based (i.e. retain the W76 warheads based on Trident missile submarines). Since the W76 warhead is undergoing an LEP it will be the most up to date of our aged weapons.⁶⁵ Given that the 1,700 warhead lower limit of SORT will likely be the upper limit of the successor to START, the fleet of 14 Trident submarines' ability to carry more than 2,600 warheads would be more than sufficient to deliver the nation's operationally deployed weapons.⁶⁶

To ensure the national leadership receives the best possible advice concerning nuclear policy and strategy, the military must inculcate nuclear expertise at its highest ranks. The study of the role of nuclear weapons in military training and education must move from only discussing history to developing an understanding of how nuclear weapon policy and strategy contributes to the nation's current and future security. This understanding is important across professional military education courses, and it is most vital at the senior service colleges, for preparing military leaders.

The issue of replacing our aged weapons must at some point be resolved. It is unrealistic to believe that the nation can continue indefinitely to rely on our older weapons without testing. Until all nuclear armed states make the commitment to eliminate their weapons, the United States must maintain a safe, secure, and reliable stockpile. In an April 2009 speech in Prague, President Obama affirmed the nation's

commitment to maintaining an arsenal even with the stated goal of eventually achieving a world free of nuclear weapons. “Make no mistake: As long as these weapons exist, the United States will maintain a safe, secure and effective arsenal to deter any adversary, and guarantee that defense of our allies.”⁶⁷ Due to the concern about maintaining continued confidence in the nuclear weapons stockpile, the previous administration had looked to the Reliable Replacement Warhead (RRW). The answer to building a new weapon may not be the RRW. Some other warhead design may be more appropriate for the security environment the United States will face, but the national leaders must no longer delay this decision. The decision to build a new warhead would not only provide the nation’s leadership with greater confidence in weapons that work, but it would also provide the country a weapon that better addresses the security environment and meets the threats the country faces.

Finally, development of new weapons would contribute to recapitalizing the nuclear weapons infrastructure. The Cold War-era infrastructure has been deteriorating for some time. Improving the infrastructure would send the message that the nation is committed to maintaining a safe, secure, and reliable stockpile for as long as nuclear weapons are needed.

Conclusion

The National Security Strategy outlines a different threat than the one we faced in the Cold War. The nuclear weapons enterprise must better match the current and future security environment. Although their use is less likely since the end of the Cold War, the presence of nuclear weapons today still provides the nation with a strategic deterrence. To maintain this deterrent, improvements are required in our nuclear weapons enterprise. The country is close to “a tipping point... from the accumulation of

delayed decisions about the nuclear weapon program.”⁶⁸ There is tremendous opportunity ahead for reinvigorating the enterprise, but only if the nation makes the commitment to change. The commitment must include modernizing our nuclear force and recapitalizing our nuclear infrastructure, while eliminating excessive weapons and delivery systems, and increasing the nuclear weapons knowledge in the services.

Endnotes

¹ James R. Schlesinger et al., *Report of the Secretary of Defense Task Force on DoD Nuclear Weapons Management, Phase I: The Air Force's Nuclear Mission* (Arlington, VA: September 2008), Report's cover memo addressed to The Honorable Robert M. Gates, 12 September 2008.

² George W. Bush, *The National Security Strategy of the United States of America* (Washington, DC: March 2006), 22.

³ Ibid.

⁴ Peter Pace, *National Military Strategy to Combat Weapons of Mass Destruction* (Washington, DC: Department of Defense, February 2006), 23.

⁵ The 2002 National Strategy to Combat Weapons of Mass Destruction (NS-CWMD) states “The United States will continue to make clear that it reserves the right to respond with overwhelming force – including through resort to all our options – to the use of WMD against the United States, our forces abroad, and friend and allies.” George W. Bush, *The National Strategy to Combat Weapons of Mass Destruction* (Washington, DC: The White House, December 2002), 3. Although the Quadrennial Defense Review (QDR) leaves specific nuclear forces discussions to the Nuclear Posture Review which typically follows the QDR in being published, the 2010 QDR does state, “We will maintain a safe, secure, and effective nuclear arsenal to deter attack on the United States, and on our allies and partners.” Robert M. Gates, *Quadrennial Defense Review Report* (Washington, DC: Department of Defense, February 2010), vi.

⁶ The first nuclear weapon was dropped on Hiroshima, Japan on August 6, 1945. It used Uranium-235 as its fissile material, and was nicknamed “Little Boy”. It was a one of a kind weapon, as it was the only time America used uranium fuel in a nuclear weapon. The second weapon, dropped on Nagasaki, Japan on August 9, 1945, and all other weapons since, used plutonium-239 as its fissile material. It was nicknamed “Fat Man.” These weapons derive their explosive power from fission, the splitting of atoms using neutrons. By the late 1940s scientists were exploring how to create fusion weapons, replicating the process by which the Sun creates energy. The first fusion weapon, also known as a hydrogen or thermonuclear bomb, was tested in October 1952. Thermonuclear weapons are called such because of the tremendous temperatures, and thus energy, needed to fuse hydrogen atoms. That necessary energy comes

from the x-rays of a fission device. In weapons that use fission to initiate the fusion process, the fission device is referred to as the primary and the fusion device is referred to as the secondary.

⁷ Thomas C. Reed and Danny B. Stillman, *The Nuclear Express* (Minneapolis, MN: Zenith Press, 2009), 368.

⁸ The “pit” is the fissile material at the core of a weapon. Pit design for fissile material has improved from solid round cores to thin-walled, hollow, out-of-round shapes. Boosting a fission weapon involves using deuterium and tritium (radioactive isotopes of hydrogen), also called gas boosting, to make additional neutrons available for the fission of plutonium atoms at the moment a supercritical mass is assembled. The result is additional energy released before the weapon literally tears itself apart, or disassembles, from the fission process. Fusion secondary refers to the fusion device in a thermonuclear, or hydrogen, bomb.

⁹ Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, *The Clock is Ticking: A Progress Report on America's Preparedness to Prevent Weapons of Mass Destruction Proliferation and Terrorism*, October 21, 2009: 18.

¹⁰ Energy released from a nuclear weapon is expressed in terms of tons of TNT equivalent. Open source information on the weapons of the United States can be found on the website <http://nuclearweaponarchive.org/Usa/Weapons/Allbombs.html> (accessed March 1, 2010).

¹¹ Bush, *The National Security Strategy*, 1.

¹² Rita Clark et al., Command Historian's Office, *History of the United States Strategic Command, June 1, 1992 – October 1, 2002* (Offutt Air Force Base, Nebraska: Strategic Command, January 15, 2004), 26.

¹³ U.S. Department of Energy, *United States Nuclear Tests: July 1945 to September 1992*, DOE/NV-209 (Rev. 14) (Washington, DC: U.S. Department of Energy, December 1994), viii.

¹⁴ Ibid., 59.

¹⁵ Daryl G. Kimball, “For a Safer America: The Case for the Comprehensive Test Ban Treaty,” Updated October 2009, linked from the Arms Control Association Home Page, <http://www.armscontrol.org/factsheets/CaseStatement> (accessed January 2, 2010).

¹⁶ Mark Thompson, “Obama's Showdown Over Nukes,” *Time*, January 29, 2009.

¹⁷ U.S. Department of Defense, *Defense's Nuclear Agency 1947-1997* (Washington DC: Defense Threat Reduction Agency, 2002), 391.

¹⁸ Press Release, *U.S. Policy on Nuclear Testing and a Comprehensive Test Ban* (Washington, DC: The White House, July 3, 1993). The CTBT bans all nuclear explosions, both military and civilian. It was adopted by the United Nations in 1996, but has not yet entered into force. The United States signed it in 1996, but the Senate has yet to give its advice and consent (i.e. ratify the treaty).

¹⁹ U.S. Department of Defense, *Defense's Nuclear Agency 1947-1997*, 391.

²⁰ U.S. Department of Defense, *Nuclear Posture Review* (Washington, DC: U.S. Department of Defense, 2001), 55.

²¹ Chuck Hansen, *U.S. Nuclear Weapons: The Secret History* (New York: Orion Books, 1988), 107.

²² U.S. Department of Energy, "Factsheet: Stockpile Stewardship Program," linked from the *National Nuclear Security Administration Home Page* at "National Security," http://www.nv.doe.gov/library/FactSheets/DOENV_1017.pdf (accessed March 9, 2010)

²³ K. Henry O'Brien et al., *Sustaining the Nuclear Enterprise – A New Approach* UCRL-AR-212442/LAUR-05-3830/SAND2005-3384 (U.S. Department of Energy, 20 May 2005), 4.

²⁴ Thomas C. Reed and Danny B. Stillman, *The Nuclear Express* (Minneapolis, MN: Zenith Press, 2009), 208.

²⁵ U.S. Department of Energy, linked from the *National Nuclear Security Administration Home Page* at "News & Information," <http://www.nnsa.energy.gov/news/1475.htm> (accessed March 24, 2010).

²⁶ U.S. Department of Energy, linked from the *National Nuclear Security Administration Home Page* at "Life Extension Programs," http://nnsa.energy.gov/defense_programs/life_extension_programs.htm (accessed March 9, 2010).

²⁷ Ibid.

²⁸ Opinion-Editorial, "A False Start," *Wall Street Journal*, January 5, 2010.

²⁹ James R. Schlesinger et al., *Report of the Secretary of Defense Task Force on DoD Nuclear Weapons Management, Phase II: Review of the DoD Nuclear Mission* (Arlington, VA: December 2008), iv.

³⁰ Ibid.

³¹ U.S. Department of Defense, *The Defense Science Board Permanent Task Force on Nuclear Weapons Surety: Report on the Unauthorized Movement of Nuclear Weapons* (Washington, DC: U.S. Department of Defense, February 2008, revised April 2008), 17.

³² Author's experience at the Army War College, email communications with fellow FA52 officers attending the Industrial College of the Armed Forces, and discussion with project advisor.

³³ U.S. Department of Defense, *Report of the Defense Science Board 2008 Summer Study on Nuclear Deterrence Skills* (Washington, DC: U.S. Department of Defense, September 2008), 40.

³⁴ FA52 officers serve in less than 40 authorized Army billets, predominantly at the United States Military Academy in the Physics and Chemistry Departments, at the 20th Support Command (CBRNE), and on the Army staff. The vast majority of the FA52 positions however are other than Army billets on the Joint Staff, Office of the Secretary of Defense, many of the

Combatant Commands, Defense Threat Reduction Agency, Defense Intelligence Agency, Department of Homeland Security, and the National Nuclear Security Administration.

³⁵ Reed and Stillman, *The Nuclear Express*, 15.

³⁶ Schlesinger et al., *Task Force on DoD Nuclear Weapons Management, Phase II: Review of the DoD Nuclear Mission*, 28.

³⁷ National Defense Research Institute, *An Assessment of Defense Nuclear Agency Functions: Pathways Towards a New Nuclear Infrastructure for the Nation* (Santa Monica, CA: RAND Corporation, 1994), v.

³⁸ George P. Schultz et al., "How to Protect our Nuclear Deterrent," *Wall Street Journal*, January 20, 2010.

³⁹ Colin S. Gray, *The Second Nuclear Age* (Boulder, CO: Lynne Rienner Publishers, 1999), 37-38.

⁴⁰ U.S. Department of Defense, *Report of the Defense Science Board 2008 Summer Study on Capability Surprise Volume I: Main Report* (Washington, DC: U.S. Department of Defense, September 2009), x.

⁴¹ U.S. Department of Defense, *Report of the Defense Science Board 2008 Summer Study on Capability Surprise Volume I: Main Report* (Washington, DC: U.S. Department of Defense, September 2009), x.

⁴² Daryl G. Kimball, "For a Safer America: The Case for the Comprehensive Test Ban Treaty," Updated October 2009, linked from the Arms Control Association Home Page, <http://www.armscontrol.org/factsheets/CaseStatement> (accessed January 2, 2010).

⁴³ Joe Biden, "The President's Nuclear Vision," *Wall Street Journal*, January 29, 2010.

⁴⁴ Walter Pincus, "Obama Budget Seeks 13.4% Increase for Nuclear Security," *The Washington Post*, February 3, 2010.

⁴⁵ Schlesinger et al., *Task Force on DoD Nuclear Weapons Management, Phase I: The Air Force's Nuclear Mission*, 21.

⁴⁶ For nuclear incident terms and definitions see CJSCM 3150.03B. *Joint Reporting Structure Event and Incidents Report*, 29 July 2003.

⁴⁷ An unclassified accounting of the incident and its systemic causes can be found in the following report: *The Defense Science Board Permanent Task Force on Nuclear Weapons Surety: Report on the Unauthorized Movement of Nuclear Weapons* (Washington, DC: U.S. Department of Defense, February 2008, revised April 2008).

⁴⁸ The warehouse at Hill AFB, UT was being managed at the time of the incident by EG&G, a contractor to the Defense Logistics Agency; from Jeremy Patterson, "Taiwan Fuses Shipment Reveals Nuclear Security Gaps," *Arms Control Today* (May 2008): 47.

⁴⁹ Jeremy Patterson, "Taiwan Fuses Shipment Reveals Nuclear Security Gaps," *Arms Control Today* (May 2008): 47.

⁵⁰ Ibid.

⁵¹ Schlesinger et al., *Task Force on DoD Nuclear Weapons Management, Phase I: The Air Force's Nuclear Mission*, 27.

⁵² Minot Air Force Base Public Affairs press release, <http://www.minot.af.mil/news/story.asp?storyID=123019971> (accessed February 7, 2010).

⁵³ Tim Korte, and Robert Burns, "Official: Nuclear Problems were Administrative," *The Washington Post*, February 11, 2010.

⁵⁴ Schlesinger et al., *Task Force on DoD Nuclear Weapons Management, Phase II: Review of the DoD Nuclear Mission*, 56.

⁵⁵ W. Spencer Johnson, "New Challenges for the Unified Command Plan," *Joint Forces Quarterly* (Summer 2002): 69.

⁵⁶ Ibid.

⁵⁷ Other studies that point to concerns with the Air Force's management of nuclear weapons include *The Defense Science Board Permanent Task Force on Nuclear Weapons Surety: Report on the Unauthorized Movement of Nuclear Weapons* (Washington, DC: U.S. Department of Defense, February 2008, revised April 2008), and *Report of the Defense Science Board Permanent Task Force on Nuclear Weapons Surety: Nuclear Weapons Inspections for the Strategic Nuclear Forces* (Washington, DC: U.S. Department of Defense, December 2008).

⁵⁸ It is important to note that the Air Force's use of the term "Global Strike" is different than STRATCOM's use. Strategic Command defines it as both nuclear and non-nuclear weapons options for defeating a target. The Air Force uses the term exclusively for nuclear weapons. This can cause confusion when using the term in a combined audience.

⁵⁹ Schlesinger et al., *Task Force on DoD Nuclear Weapons Management, Phase I: The Air Force's Nuclear Mission*, 27.

⁶⁰ United States Air Force Global Strike Command website <http://www.afgsc.af.mil/main/welcome.asp> (accessed 2 March 2010).

⁶¹ The Army possessed nuclear weapons as well, but eventually got out of the nuclear weapon employment business in the 1990s after the Intermediate-range Nuclear Forces (INF) Treaty eliminated the Pershing II missiles from the U.S. inventory.

⁶² A Trident missile can hold eight warheads, with the 14 Ohio-class submarines carrying 24 missiles each.

⁶³ Only later would the concept of the Triad be linked to the policy of deterrence which made it impossible for the Soviet Union to succeed in carrying out a first-strike against the nation's entire arsenal.

⁶⁴ Schlesinger et al., *Task Force on DoD Nuclear Weapons Management, Phase I: The Air Force's Nuclear Mission*, C-2.

⁶⁵ The President's fiscal year 2011 budget would fully fund the Life Extension Program for the W-76 warhead. It would also provide funding to study options for maintaining the W-78 warhead used on the Minuteman III missile. See Walter Pincus, "Obama Budget Seeks 13.4% Increase for Nuclear Security," *The Washington Post*, February 3, 2010.

⁶⁶ With the full complement of fourteen Trident submarines at sea, the U.S. could have 336 missiles (24 missile tubes per submarine) carrying 2,688 warheads (eight warheads per missile) available for use. Since it is more likely that only about half the submarines are at sea at any one time, the nation still could have as many as 1,300 nuclear weapons deployed on Trident submarines.

⁶⁷ Press Release, *Remarks by President Barack Obama, Hradcany Square, Prague, Czech Republic* (Washington, DC: The White House, April 5, 2009).

⁶⁸ William J. Perry et al., *America's Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States* (Washington, DC: United States Institute for Peace Press, 2009), xv.