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A White Paper:

Pursuing a New Nuclear Weapons Policy for the 21st Century

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Introduction

With every new Presidential Administration, a strategic review is usually held to recalibrate the content and direction of U.S. military strategy and policies. With the end of the Cold War in 1991, there was considerable confusion as to what our nations nuclear posture should be. There were many schools of thought as to what should happen with the large arsenal of nuclear weapons built up by both the U.S. and the former Soviet Union. There was widespread agreement that substantial reductions could be achieved, and the START (Strategic Arms Reduction Treaties) process began to realize that goal. However, the process is currently paused at START II, which would set a limit of 3,000 to 3,500 deployed strategic warheads, with agreement of only a framework for a follow-on START III (2,000 to 2,500 warheads on deployed strategic launchers). In the 1993 review of our military posture, nuclear weapons questions initially were put aside, then undertaken under a separate activity called the Nuclear Posture Review, which was completed in 1994. A strategy called “lead and hedge” became U.S. policy, in which the U.S. would attempt to lead the way to much smaller nuclear arsenals, as we sought to engage Russia and the other inheritor states in more positive international relations, while at the same time sustaining the option to rearm, should there be a revanchist movement within these states to raise the threat level against the U.S.

In 1997, with the Clinton Administration continuing for a second term, there was little change in the public eye regarding nuclear weapons strategies, although an internal effort to update U.S. nuclear doctrine was issued as a classified directive to the Pentagon through a Presidential Decision Directive. During the next few years, the rest of the U.S. government was, for the most part, silent regarding nuclear weapons policy and doctrine. From 1993 through 2000, a number of non-governmental organizations (NGOs) entered the public debate with their own proposals, mostly seeking to abolish nuclear weapons. They and others began to suggest that nuclear weapons could be reduced to extremely low levels,

advocating instead that advanced conventional weapons—particularly precision-guided munitions—should become the primary defense option.

Today, the U.S. and Russian strategic dialogue no longer focuses on the question of *how many weapons are enough?* But each has shifted to a more cautious stance in considering the flip side of the question, *how few are enough?* At the same time, tens of thousands of other nuclear weapons—the so-called "nonstrategic" devices intended for use in theater or tactical conflicts—remain outside of the START frameworks.

Consequently, the U.S. and Russia no longer appear to place nuclear arms limitations at the top of their priority lists, more than likely because of an increasingly shared view that war between the two is far less likely than during the Cold War Era. [The U.S. National Security Advisor, Condi Rice, recently stated that "American security is threatened less by Russia's strength than by its weakness and incoherence."] Each side now devotes more effort in seeking ways in which they might move to a new relationship as "strategic partners."

I served as an arms negotiator on the last two agreements before the dissolution of the Soviet Union and have spent most of my career enmeshed in the complexity of nuclear weapons issues on the government side of the table. It is abundantly clear (to me) that formulating a new nuclear weapons policy for the start of the 21st Century will be a most difficult undertaking. While the often over-simplified picture of deterrence during the Cold War—two behemoths armed to the teeth, staring each other down—has thankfully retreated into history, there are nevertheless huge arsenals of nuclear weapons and delivery systems, all in quite usable states, that could be brought back quickly to their Cold War postures. Additionally, throughout the Cold War and ever since, there has been a steady proliferation of nuclear weapons and other weapons of mass destruction by other nations around the globe. The vast majority of these newly armed states are not U.S. allies, and some already are exhibiting hostile behaviors, while others have the potential to become aggressors toward the U.S., our allies, and our international interests.

Russia has already begun to emphasize the importance of its arsenal of nuclear weapons to compensate for its limited conventional capabilities to deal with hostilities that appear to be increasing along its borders. It seems inescapable that the U.S. must carefully think through how we should be preparing to deal with new threats from other corners of the world, including the role that nuclear weapons might serve in deterring these threats from ever reaching actual aggressions.

I personally see the abolition of nuclear weapons as an impractical dream in any foreseeable future. I came to this view from several directions. The first is the impossibility of ever "uninventing" or

erasing from the human mind the knowledge of how to build such weapons. While the sudden appearance of a few tens of nuclear weapons causes only a small stir in a world where several thousands of such weapons already exist, their appearance in a world without nuclear weapons would produce huge effects. (The impact of the first two weapons in ending World War II should be a sufficient example.) I believe that the words of Winston Churchill, as quoted by Margaret Thatcher to a special joint session of the U.S. Congress on February 20, 1985, remain convincing on this point: "Be careful above all things not to let go of the atomic weapon until you are sure, and more sure than sure, that other means of preserving the peace are in your hands."

Similarly, it is my sincere view that the majority of the nations who have now acquired arsenals of nuclear weapons believe them to be such potent tools for deterring conflicts that they would never surrender them. Against this backdrop, I recently began to worry that because there were few public statements by U.S. officials in reaffirming the unique role which nuclear weapons play in ensuring U.S. and world security, far too many people (including many in our own armed forces) were beginning to believe that perhaps nuclear weapons no longer had value. It seemed to me that it was time for someone to step forward and articulate the other side of these issues for the public: first, that nuclear weapons remain of vital importance to the security of the U.S. and to our allies and friends (today and for the near future); and second, that nuclear weapons will likely have an enduring role in preserving the peace and preventing world wars for the foreseeable future. These are my purposes in writing this paper.

For the past eight years, I have served several Commanders-in-Chief of the U.S. Strategic Command by chairing the Policy Subcommittee of the Strategic Advisory Group (SAG). This group was asked to help develop a new terms of reference for nuclear strategy in the post-Cold War world. This paper draws on many of the discussions with my SAG colleagues (although one must not assume their endorsement of all of the ideas presented here). We addressed how nuclear deterrence might be extended—not just to deter Russia—but how it might serve a continuing role in deterring wider acts of aggression from any corner of the world, including deterring the use of nuclear, chemical or biological weapons. [Taken together, these are normally referred to as Weapons of Mass Destruction (WMD).] My approach here will be to: (1) examine what might be the appropriate roles for nuclear weapons for the future, (2) propose some new approaches to developing nuclear strategies and policies that are more appropriate for the post-Cold War world, and (3) consider the kinds of military systems and nuclear weapons that would be needed to match those policies.

The Role(s) of Nuclear Weapons

The Commander-in-Chief of the Strategic Command, Admiral Rich

Mies, succinctly reflected the current U.S. deterrent policy last year in testimony to the U.S. Senate: "Deterrence of aggression is a cornerstone of our national security strategy, and strategic nuclear forces serve as the most visible and most important element of our commitment Š (further) deterrence of major military attack on the United States and its allies, particularly attacks involving weapons of mass destruction, remains our highest defense priority." While the application of this policy seemed clear, perhaps we could have said even "straightforward," during the Cold War; application of that policy becomes even more complicated if we consider applying it to any nation other than Russia.

Let me first stress that nuclear arms must never be thought of as a single "cure-all" for security concerns. For the past 20 years, only 10 percent of the U.S. defense budget has been spent on nuclear forces. The other 90 percent is for "war fighting" capabilities. Indeed, conflicts have continued to break out every few years in various regions of the globe, and these nonnuclear capabilities have been regularly employed. By contrast, we have not used nuclear weapons in conflict since World War II. This is an important distinction for us to emphasize as an element of U.S. defense policy, and one not well understood by the public at large. Nuclear weapons must never be considered as war fighting tools. Rather we should rely on the catastrophic nature of nuclear weapons to achieve **war prevention, to prevent a conflict from escalating** (e.g., to the use of weapons of mass destruction), or **to help achieve war termination** when it cannot be achieved by other means, e.g., if the enemy has already escalated the conflict through the use of weapons of mass destruction. Conventional armaments and forces will remain the backbone of U.S. defense forces, but the inherent threat to escalate to nuclear use can help to prevent conflicts from ever starting, can prevent their escalation, as well as bring these conflicts to a swift and certain end.

In contrast to the situation facing Russia, I believe we cannot place an over-reliance on nuclear weapons, but that we must maintain adequate conventional capabilities to manage regional conflicts in any part of the world. Noting that the U.S. has always considered nuclear weapons as "**weapons of last resort**," we need to give constant attention to improving conventional munitions in order to raise the threshold for which we would ever consider nuclear use. It is just as important for our policy makers to understand these interfaces as it is for our commanders.

Defenses

Although it is beyond the scope of this paper to strictly consider "defensive" tactics and armaments, I believe it is important for the United States to consider a continuum of defensive capabilities, from boost phase intercept to terminal defenses. Defenses have always been an important element of war fighting, and are likely to

be so when defending against missiles. Defenses will also provide value in deterring conflicts or limiting escalations. Moreover, the existence of a credible defense to blunt attacks by armaments emanating from a rogue state could well eliminate that rogue nation's ability to dissuade the U.S. from taking military actions. If any attack against the U.S., its allies, or its forces should be undertaken with nuclear weapons or other weapons of mass destruction, there should be no doubt in the attacker's mind that the United States might retaliate for such an attack with nuclear weapons; but the choice would be in our hands.

If high effectiveness defenses can be achieved, they will enhance deterrence by eliminating an aggressor's confidence in attacking the U.S. homeland with long-range missiles, and thus make our use of nuclear weapons more credible (if the conflict could not be terminated otherwise.) Whereas, nuclear weapons should always remain weapons of **last** resort, defensive systems would likely be our **weapons of first resort**.

Nuclear Weapons: An Enduring Strategic Tool?

Throughout my career, I have had the opportunity to participate in a number of "war games" in which the roles and uses of nuclear weapons had to be faced in scenarios that imagined military conflicts developing between the U.S. and other potential adversaries. The totality of those games brought new realizations as to the role and purpose of nuclear weapons, in particular, how essential it is that deterrence be tailored in a different way for each potential aggressor nation. It also seemed abundantly clear that **any use of nuclear weapons is, and always will be, strategic**. Thus, I would propose we ban the term "nonstrategic nuclear weapons" as a non sequitur.

The intensity of the environment of any war game also demonstrates just how critical it is for the U.S. to have thought through **in advance** exactly what messages we would want to send to other nations (combatants and noncombatants) and to "history," should there be any future use of nuclear weapons—including threatened use—in conflicts. Similarly, it is obvious that we must have policies that are well thought through **in advance** as to the role of nuclear weapons in deterring the use of, or retaliating for the use of, all weapons of mass destruction.

Let me then state my most important conclusion directly: I believe **nuclear weapons must have an abiding place in the international scene** for the foreseeable future. I believe that the world, in fact, would become more dangerous, not less dangerous, were U.S. nuclear weapons to be absent. The most important role for our nuclear weapons is to serve as a "sobering force," one that can cap the level of destruction of military conflicts and thus force all sides to come to their senses. This is the enduring purpose of

U.S. nuclear weapons in the post-Cold War world. I regret that we have not yet captured such thinking in our public statements as to why the U.S. will retain nuclear deterrence as a cornerstone of our defense policy, and urge that we do so in the upcoming Nuclear Posture Review.

Nuclear deterrence becomes in my view a "countervailing" force and, in fact, **a potent antidote to military aggression** on the part of nations. But to succeed in harnessing this power, effective nuclear weapons strategies and policies are necessary ingredients to help shape and maintain a stable and peaceful world.

In developing nuclear deterrent policies for this new age, I want to share with you some thinking that can lead to a new framework for the role of nuclear weapons in defense. It is still quite skeletal in nature, but it appears to have some advantageous characteristics that can provide a new approach on the way to creating a comprehensive, post-Cold War nuclear weapons policy.

The proper order of things is first to develop the policy before attempting to define a force structure. In this monograph I have adopted that approach and then will examine force structures that can be responsive in implementing the policy(ies). Finally, I will briefly examine the issues that must be faced in sustaining that force. I will describe at least some of the advantages I believe this new framework can provide, and I would ask all you readers to examine the disadvantages, problems, or fatal flaws it may have, as well. Doubtless the opportunities for improvement are great, owing in no small part to the opening up of options that we had previously discarded in the U.S.-U.S.S.R. archetype.

Central Deterrence (and Capability One)

In introducing this framework, I would begin with one critically important observation: **Russia today is the only nation that we can conceive of with the potential to threaten the U.S. national existence**. It would be exceedingly foolish to allow our deterrent forces against Russia to weaken as long as that potential remains in place. Therefore, in the near term (say 10 years or so) our major plans and force decisions will continue to be based on **hedging against Russia**. The strategy and policy for continuing to deter Russia follows closely that which we developed during the Cold War. The current war-planning approach (the Single Integrated Operational Plan) and its configuration of forces have been transitioning somewhat in recent years, but are in surprisingly good shape. We would continue to focus on treaty-limited strategic weapons in configurations that lead to stability against surprise attacks and bound the uncertainties of each side's intentions and actions toward the other. Our future arms control efforts with Russia must endeavor to somehow take account of the total nuclear arsenals of each side, not just those within the START framework.

Each side will want to evaluate carefully its needs for nuclear forces beyond the mutual deterrence purposes and seek ways to harmonize its forces.

As long as there are large destructive forces in being, I believe that the deterrent policy and the force structure created during the Cold War cannot be abandoned entirely. One can imagine a continuum of nuclear weapons capabilities which at the high end could be used to deter Russia and at the low end could be adapted to deter other states. How the future unfolds [particularly with respect to theater nuclear planning] will determine whether and how such a policy and its accompanying capabilities would change over time. I expect the U.S./Russia relationship will change only slowly, although a warming would be welcomed, perhaps making it possible someday to eliminate the need for the high end of our nuclear arsenal, provided of course that that another powerful, potentially powerful nation does not arise to take its place. I will designate that portion of our strategic force capability that continues to be devoted to deterrence of Russia as **Capability One**.

I would assume that it is far preferable for our strategic relationship with China (where we are hoping to become stronger trading partners) that we should not single out China to be in a separate or specific category for nuclear deterrence. China has exercised considerable restraint in the rate that they have grown and modernized their strategic nuclear forces, and we should avoid any action on our part that could lead China to respond —either by increasing its nuclear forces substantially above the more modest strategic nuclear forces presently deployed or by speeding up the currently quite measured pace of its strategic nuclear modernization. These same issues will arise as the U.S. begins to enhance its ballistic missile defense capabilities, in order to assure China that, while our defenses could be effective against an accidental launch, they are not being designed to counter their entire strategic deterrence force.

Of course, if China ever were to substantially increase its forces and thereby **place itself** within a threat level more proximate to that of Russia, the changes in policy, strategy, and force approach the U.S. would need to make would be obvious. We could respond at that time by configuring a force more in line with Central Deterrence (i.e., **Capability One**), having high confidence in its efficacy.

Deterrence of Wider Threats: A Second Capability

I would begin the discussion of deterring wide threats with another important observation: **I believe that nuclear weapons do have a place and purpose today in other than a Russian context.** Rather than inflame debates prematurely as to who is or may become America's enemies or adversaries, I would call the second force capability simply the "Non-Russian Force" or **Capability Two**. In

my early thinking on this subject, I even referred to this second force as the "To Whom It May Concern" Force.

The whole question of , "Against whom would we really contemplate the use of nuclear weapons?" is an important political and international issue. A direct response might well be "Any nation or (targetable) sub-national entity which, if not otherwise deterred, might be tempted to employ nuclear weapons (or other weapons of mass destruction) against the United States, our forces, or our allies." We have made pledges not to attack with nuclear weapons those nations who either do not possess, or are not allied to aggressor nations who do possess, nuclear weapons. We have formally maintained such declarations even in the face of very destructive other weapons (e.g., chemical, biological, or radiological) being stockpiled, and in several cases actually used, by some states, although the last Administration maintained a policy of studied ambiguity about whether its so-called Negative Security Assurances applied to states armed with other forms of WMD. We have continued with these policies primarily to discourage the proliferation of nuclear, chemical, and biological weapons. We have also urged the acceptance of treaties that would globally ban both biological and chemical weapons, even though progress has been agonizingly slow in achieving complete elimination of such weapons.

In several crises, U.S. presidents have warned other nations that "unspeakable destruction" would be the result should they resort to attacks on the U.S. or its allies with such "weapons of mass destruction." Although the U.S. has been careful not to suggest that such retaliations would inevitably mean we would use nuclear weapons, we have left open the possibility for aggressor states to conclude for themselves that perhaps we might indeed use such weapons. We have certainly wanted adversaries to think hard about this possibility. Unfortunately, we cannot enjoy the ambiguity of such declarations forever, even though the decision to seriously consider nuclear retaliation for use of less than nuclear weapons would carry a heavy burden of demonstrating "proportionality." I believe the fact that we have not thought through these complex issues sufficiently is the reason the last U.S. Administration chose not to publicize its most recent deterrent strategy.

I believe we face an even greater difficulty if we look at how we have been going about planning for potential Theater Nuclear Options (or TNOs). There has been no clear policy in place—I can even say there has been a lack of clear thinking in place —regarding "limited nuclear attacks." We have been reduced to contemplating within each theater CINC's Area of Responsibility (AOR) the particular targets that should be held at risk and then analyzing appropriate options for attacking them with various weapons systems—nuclear and nonnuclear. But, without a well-understood and well-justified policy in place, the development of TNOs are of limited value and might even appear to be "nuclear war fighting." Any nuclear battle plans without solid policy bases are certain to prove unsatisfactory, and the challenge for us today is to develop

that sound policy foundation. I believe that our policy in these cases should emulate our Cold War policies; that is, it should focus first on deterrence of conflict, escalation control, and war prevention; and contemplate nuclear attacks only if deterrence should fail in these aims.

Policy for Deterrence of Wider Threats (Capability Two)

Among the fundamentals of a policy, the U.S. should reemphasize the principle it has embraced for most of the Cold War, namely that we will **never directly or systematically target civilians.** This principle has been a foundation of our Russian deterrence policy as well, although far too few are even aware of it.

I believe I am safe in asserting that in considering nuclear deterrence in a non-Russian context, **collateral damage issues will be of even greater importance than ever before.** These issues must be better understood in contemplating nuclear attacks against a North Korea, an Iran, an Iraq, or even a China.

The fact that civilians in these nations have no voice in developing the policies of their government would make their slaughter abhorrent to Americans, as it would be to any well-meaning peoples of the world. Targeting the leadership, along with military forces and military capabilities—the very tools of aggression— as was done against the Soviet Union; these are the appropriate primary targets that should be held at risk under any U.S. deterrent policy.

In examining the characteristics of post-Cold War deterrence, it appears important to make our policy and plans both country and leadership specific. At the same time, we should appropriately keep our thoughts confidential regarding whom or how. If and when a future conflict first begins to unfold, that will be the time for us to communicate—directly, but perhaps still not publicly—what it is that we do not want them to do (i.e. what we are trying to deter). That will also be the time for us to communicate our capabilities to hold at risk what they value and, if possible, to protect what we value. While we should remain ambiguous about the details of what our specific responses to their acts of aggression would be, we must make abundantly clear that our actions would have terrible consequences for them. Finally, the most important foundation for our policies and actions, and the most important part of our communications to the other side in an impending crisis must be that **we have the national will**, as well as the full means, to carry out our intended actions.

Adopting such a policy will place enormous challenges before the U.S. intelligence communityto provide the same detailed level of understanding about potential aggressors as was determined for the former Soviet Union during the Cold War. This understanding must include elements of their culture, their values, their leadership, as

well as operational data regarding strategic target coordinates and characteristics.

U.S. Declaratory Policies and Communications

I believe it will be important to make a part of our declaratory policy that the United States ultimate intent, should it ever have to unleash a nuclear attack against any aggressor, would be to threaten the survival of the regime leading that state. Here, I do not mean that the aggressor state would cease to exist as a nation, but that governance under the existing national government could no longer be tolerated. Thus, unless that state's leaders are deterred from the acts we are seeking to deter, our war aims would be single-minded—**to destroy that leadership's ability to govern**. Because it is so important that this never be just an idle boast, which could undercut deterrence, I believe it is essential for us to preplan our targets for any likely contingency. While adaptive planning capabilities will be necessary also and important in preparing us to handle events we cannot always predict or know, they just cannot rise to the same level of sophistication as we could achieve in deliberative planning. Only with the luxury of contemplation are we likely to perfect the messages our actions should send to the instant, as well as all future, combatants.

As was mentioned at the outset, the most difficult issue may be the question of whether or not the U.S. would attack a nation with nuclear arms, if that nation possessed biological or chemical weapons but did not possess nuclear arms at the time (nor was it allied to a nation who had nuclear weapons). We have some historical examples of this difficulty, and it is imperative that the U.S. must avoid being viewed as a "global hegemon." In spite of growing international pressures, we have attempted to prevent our hands from being tied by such a constraint— preferring to have the policy appear in Executive Orders and Declaratory Policies that could be changed, rather than allowing treaty provisions to govern this issue. I believe this is the right course of action, and that those who would advocate that we should not be allowed to consider deterring chemical or biological attacks with our nuclear arsenal must first show how such attacks might be deterred by other means.

Nuclear Alliances

Another issue that needs much more careful thought is the question of nuclear alliances. I believe that the NATO alliance has been of major importance because of the fact that it was a nuclear alliance. It also has prevented further proliferation by the member states because of the possibility of enjoying the benefits of nuclear deterrence through burden sharing of those forces within the alliance. Today the NATO dual-capable air nuclear forces are

admittedly of lower value in a joint strategy of Russian deterrence, owing to the fact that the Russian borders have receded so far away from the bases, and because it is so unlikely these aircraft could penetrate Russia's substantial air-defenses. Yet I believe these dual-capable air forces could be an extremely important component of an Allied force to deter aggression in wider parts of the world; and thus I would suggest that the NATO nuclear forces could make important contributions in deterring wider threats, while also motivating NATO to preserve the safety, security, and operational readiness of deployed NATO nuclear forces, as the Russian threat (hopefully) recedes.

An important question for the future will be whether nuclear alliances would be advantageous in other parts of the world. In particular, the actions of India and Pakistan to develop and field nuclear forces are causing considerable angst throughout the South Asian region. The large populations there, in a burgeoning array of nation states—some quite unstable already—will doubtless present many challenges in the future. The issue of whether, and if so how, to consider the creation of nuclear alliances in that part of the world is a timely issue for the U.S. and others to contemplate.

Characteristics of Capability Two: Deterrence of Wider Threats

Let me now advance to a discussion of potential characteristics of a force capability designed to deter wider threats. In some past conflicts, such as the bombing strike against Libya, and during the planning stages of other contemplated attacks, **overflight of noncombatant nations** (by bombers or cruise missiles) was a major consideration in determining whether or how to undertake such attacks. Penetration of the air space of a sovereign nation with bombers or cruise missiles would be a violation of international law, as would be the reentry of a ballistic warhead through such air space (even if it traveled beyond). Such concerns would multiply considerably, if we should contemplate nuclear deterrence in a **non-Russian** context. For example, if our craft or missiles had to fly near (or through) Russian borders, Russia might well believe that the U.S. was attacking them, and a retaliatory response could be triggered. Thus, it would appear that ICBMs may be of lesser utility in the second capability of our forces, if these would have to transit Russia in flying enroute to targets in the nations of concern.

Of course, if future missiles can have greatly increased ranges, allowing them to fly over the South Pole or at other polar angles, the difficulty of avoiding Russian overflight paths would be alleviated. Ballistic and cruise missile-carrying submarines inherently provide some relief against these overflight problems, but their patrol areas would have to be altered from what is currently the case. It should also be noted that while it is theoretically possible to reach any target on earth with manned bombers, very significant

tanker support would be required in many parts of the globe.

Next, outside of some number of targets in China, there is little real utility or need in having any MIRVed missiles in **Capability Two**. I think we must contemplate placing some number of singlet reentry vehicles carrying low-yield weapons on submarine-launched missiles. These, along with cruise missiles from both bombers and submarines, are likely to be the most important weapons in **Capability Two** because they also allow us to have "forward-basing" in a crisis, again without encountering major overflight difficulties.

In a somewhat obvious way, aside from the still perplexing issues of how to hold at risk hardened or deeply buried underground targets, I believe that we would desire primarily low-yield weapons with highly accurate delivery systems for deterrence in the non-Russian world. Here, I'm not talking about sub-kiloton weapons (i.e., "mini-nukes") as some have advocated, but devices in the low-kiloton regime, in order to contemplate the destruction of some buried or hidden targets, while being mindful of the need to minimize collateral damage. I believe we can achieve the low-yield levels that are likely to be most appropriate for deterring wider threats, particularly if we are unable to design and test new weapons under a nuclear testing moratorium, by depending on the features inherent in many designs in the current U.S. stockpile. An obvious and also very effective approach to obtain low-yield devices would be to use dummy secondaries as a way of quickly achieving single-stage yields (primary-only yields) without having to modify the devices, or to repeat flight tests for the delivery systems, or to conduct additional nuclear testing.

There are many other aspects of modernizing the warheads' electronics as we bring them into being as a **Capability Two**. We could add the ability to retain a much larger number of preplanned targets within each delivery system, either within the electronic memories of each warhead or within the fire control systems, as has been achieved in advanced conventional systems. I believe that we will also want to consider possibilities for instantly determining impact coordinates and instant bomb damage assessment (BDA), through already-developed technology, in conjunction with the existing satellite-based nuclear explosion detection system.

Such a system would critically depend on the defense satellite constellations still functioning during a conflict in which only a limited number of nuclear weapons would be available for use. During the Cold War, we had always assumed that, in any strategic nuclear conflict with Russia, the satellite constellations would probably be severely damaged. Changing this assumption might open up even greater opportunities for imagination, e.g., the ability to include GPS guidance systems for even greater precision in nuclear weapon delivery. Many of the improved guidance systems now being incorporated into a variety of modern conventional munitions could quite easily be applied to nuclear delivery vehicles. Similarly, for the first time it should be possible to minimize

collateral damage (and insure against any compromise of design technology) by including technology that could harmlessly destroy any U.S. warhead without giving nuclear yield, if it had flown off course to the extent that it would fall outside preplanned delivery coordinates.

Arms Control Implications of the Two Capability Framework

The partitioning of our nuclear forces into two different capability sets, each designed for a different primary purpose, may also present some opportunities for fresh thinking in the area of arms control. Any arms control issues or opportunities ought to be considered in concert with the development of new U.S national security strategy, rather than added on later. As the new administration unfolds its arms control strategy it will be timely to examine how the creation of two distinct policies, strategies, and force capabilities might solve some of the classic problems inherent in past agreements. For example, the U.S. (and no doubt the Russians also) labored heavily in both the INF and START negotiations to develop definitions that, while restraining each side's strategic nuclear forces in agreed ways, would not also overly constrain the development of new delivery systems intended for conventional payloads. Similar problems can be easily envisioned as we seek to continue the current limitations on forces intended for Central Deterrence, while also segmenting some of our nuclear force capabilities for Deterring Wider Threats.

A second problem that must be considered in the arms control arena, as well as in defense planning, is the likely continuing trend of proliferation of both nuclear and other destructive weapons in rogue states —who could not hope to directly defeat the United States in a general conflict, but who might very well be prepared to use these weapons in an attempt to deter the U.S. from intervening in what they perceive to be "their" regional conflicts. So far the existing agreements (the Nonproliferation Treaty, agreements to create nuclear weapon-free zones, or nuclear test ban treaties) have had only marginal success. Eventual agreements for limiting **Capability Two** forces would need to be evaluated against the totality of such potential threats.

Postlogue

As with any significant departure from the status quo, I am confident there is much more work to be done in evaluating the pros and cons of this duality framework—of reconciling the needs for a continuing Central Deterrence while also making appropriate preparations for Deterrence of Wider Threats. Dividing the strategic world and the corresponding force capabilities into two distinct

parts —**Capability One** and **Capability Two** —opens up many avenues for thought, and we should thoroughly explore these "new territories" as we undertake the upcoming Nuclear Posture Review. Within our own staff here at Sandia National Laboratories, each individual who has considered the possibilities—which this approach allows—leaps to additional ideas and opportunities. I hope this treatise has sparked at least some interest in you, my reader, to enlarge the possibilities for consideration of nuclear deterrence for the future.

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