



A Perfect Storm over Nuclear Weapons

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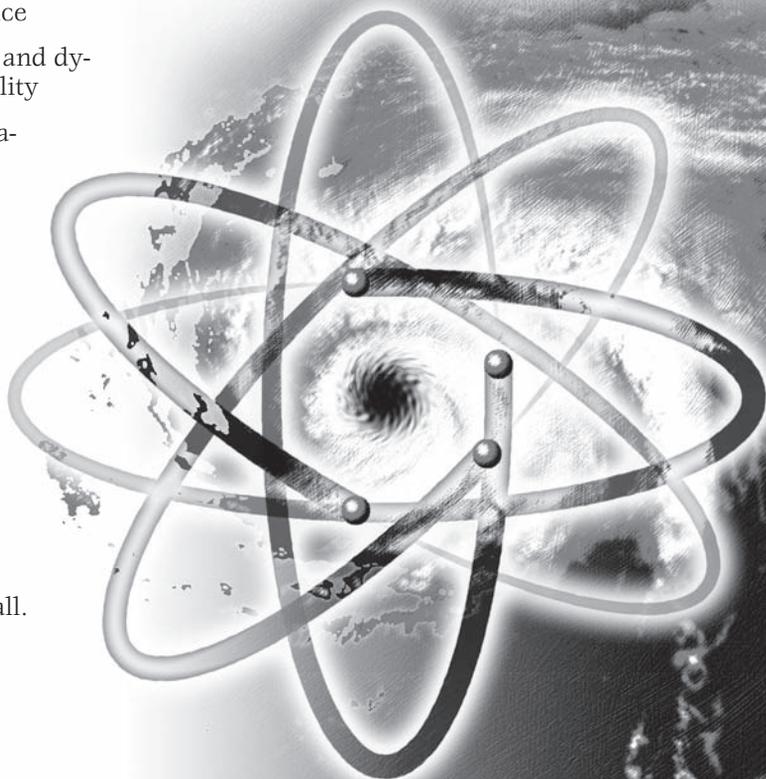
America faces a critical decision point in history. The nuclear deterrent that kept us safe for the past half century has deteriorated to the point of near failure, and we face a confluence of dangers—a “perfect storm”—that threatens our very existence as a nation. Our nuclear perfect storm is far more complex and dangerous than the meteorological perfect storm of 1991, which added this term to our vocabulary. Ours has been building for two decades since the Cold War ended, and today we are engulfed in the convergence of five immense challenges:

- Rapidly increasing nuclear threats of new and different types
- A lapsed and totally out-of-date strategy of nuclear deterrence
- An old, virtually irrelevant, and dying nuclear-weapons capability
- Unchecked nuclear proliferation on the verge of triggering a cascade
- Ill-advised and dangerous disarmament proposals designed to implement the vision of “a world without nuclear weapons”

Our overarching need, of course, is to meet all the interlocked challenges effectively. This article addresses each of these five and then suggests an integrated approach whereby national leadership can realize a successful outcome for all.

Nuclear Threats

Nuclear-weapon threats to the United States and its allies have steadily increased over the past 20 years, but because they're so different from the global thermonuclear threat of the Cold War, they have gone virtually unnoticed. Russia tops the list. First, it is still the only nation capable of destroying the United States. Second, Russia *must* increase its nuclear-weapons capability, as this is the only reason for its being considered a superpower. Third, over the past decade, the Russians have changed their military strategy to one based on the early use of nuclear



weapons in all military conflicts, large or small. Fourth, they have preserved thousands of Cold War-era tactical nuclear weapons—a force unmatched by any Western power. Fifth, they have a robust, active industrial base for producing nuclear weapons. Sixth, for two decades, they have focused on researching, developing, testing, designing, and producing advanced, highly usable nuclear weapons: very low yield, radiation intensive, and relatively “clean” but still immensely destructive. Seventh, they plan to deploy

Chinese objective calls for gaining full access to the Pacific through control of Taiwan, doing so peaceably if possible but through force if necessary. Since the United States has aligned itself to oppose such an action militarily, China intends to make any US action so extremely costly that we will opt for international pressure rather than armed combat.

Pakistan possesses nuclear weapons, and it is modernizing them. Its political situation is so unstable that those 100-odd weapons could soon fall into the

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tactical nuclear weapons in several ways, including the launching of cruise missiles from submarines. The US-Russian nuclear arms-control treaty now being negotiated to replace the Strategic Arms Reduction Treaty (START I) covers none of these tactical nuclear weapons. Finally, Russia is modernizing its strategic nuclear forces.

China poses a different type of nuclear threat. Chinese leaders recognize that they have now become a global, rather than regional, economic power. To advance to true superpower status, China must become a global military power as well. Thus, it has embarked upon a huge strategic-modernization program, ranging from space warfare and cyberwar capabilities to aircraft carriers and—most notably—nuclear weapons. The latter include greater numbers of advanced, high-yield strategic missiles with increased range to reach US targets, as well as nuclear antiship missiles. An early

hands of Islamic fundamentalists, for many of whom America is the principal target. North Korea and Iran are rogue states, well on their way to becoming nuclear-weapon powers, and, to date, the world has chosen not to stop them. The North Koreans have already conducted two nuclear-weapon tests, and if they successfully begin production of capable weapons, they would probably sell them to any state or organization able to pay. Iran may have a year or two to go before production, but once that occurs, it could very well transfer weapons to terrorist organizations (e.g., Hezbollah, Hamas, and al-Qaeda) for proxy attacks on the West.

Finally, in addition to remaining aware of the above specific threats, we must also fully prepare for the *unknown* nature of the future. With startling speed, friends can become enemies; hostile forces can take over supportive nuclear-weapon states; major US vulner-



abilities may occur unexpectedly; advanced weapons can present us with totally new threats; adversaries may form unanticipated alliances, greatly raising threat levels; and so on.

In sum, nuclear weapons exist, and they aren't going away—ever. There are tens of thousands of them in the world today. More states have them than ever before. Over half the world's population lives in states that possess nuclear weapons. Every such state in the world—with the sole exception of the United States—is modernizing its arsenal. Rogue states and terrorist organizations worldwide seek them unceasingly. On the research-and-development front, “fourth-generation” nuclear weapons loom just around the corner. Most importantly, basic nuclear-weapons technology—well known and available everywhere on the earth—will continually advance and never disappear. Consequently, small groups with modest technical qualifications can produce nuclear weapons that work well.

Given the great number of different threats from these weapons, the probability of our actually confronting some of them is quite high. Any such attack carries huge consequences—world changing. Thus, we urgently need a new, relevant US strategy of nuclear deterrence—and it must hedge on the side of strength.

Nuclear Deterrence

Unfortunately, all is not well with US nuclear deterrence. Initially, let's speak of deterrence in general, for it has been a powerful tool since prehistory. Deterrence is based upon *fear*. We alter the behavior of an adversary by threatening him. First we tell the leadership that taking a specific action, or failing to do so, will produce intolerable consequences for them. Then we convince the adversary, by reinforcing actions, that we have the *capability* and the *will* to carry out our threat. Deterrence has

proven a highly effective control mechanism since people arrived on the earth. Historically, successful completion of a difficult negotiation on any major issue has always required a threat of force in the background. The greatest benefit of deterrence is the high probability of achieving our objective without resorting to violence.

Nuclear deterrence has been with us since the dawn of the nuclear era. It *works!* We're all here today because it works. During the 40-plus years of the Cold War—the most deadly confrontation of superpowers in history—nuclear deterrence worked flawlessly. Those decades saw hundreds of major crises and dozens of “hot” wars; yet, the poised readiness of thousands of nuclear weapons, fine tuned to destroy the Soviets' most valued assets, was completely effective in preventing the use of a single nuclear weapon. But to keep deterrence working during those years, we had to redesign our nuclear weapons continually to meet changing conditions, threats, strategy, technology, Soviet leadership, and so on. Our nuclear deterrence brought about the end of the Soviet Union and the defeat of communism without violence.

Now fast-forward to the twenty-first century. Deterrence is nowhere to be found. What happened? The standard answer declares that no one can deter terrorists. On the contrary, we *can* deter them (but that's a topic for another day), and, more to the point, we should aim our nuclear deterrence at rogue states—today's most likely source of nuclear weapons for terrorists. We can most definitely deter those states.

So, “what happened?” amounts to a number of things. We didn't identify our enemy correctly; we didn't make the tough intellectual effort to recast our nuclear-deterrence strategy to meet this new threat; we didn't have the firmness to design, test, and build several types of new counterproliferation weapons; we convinced ourselves that it was inappro-

priate to threaten other nations; and—most importantly—we didn't engage the American people in a continuing national debate on nuclear deterrence, a debate as intensive as that maintained during the Cold War.

What form would nuclear deterrence take today? If we had prepared properly, it would develop like this. First, we identify our target—let's say, Iran—and issue this declaratory statement: "If you do not demolish your facilities for producing nuclear weapons, we will do it with military force, to prevent proliferation." We offer no deadlines, amplification, or negotiation. Note that we *never* refer to our use or nonuse of nuclear weapons. Proper preparation would have attracted strong bipartisan support for the statement. Prior national debate would have produced public consensus on deterrence. This unanimity is vital in showing national will.

We then commence a continuing stream of powerful (and expensive) reinforcing actions, with both conventional and nuclear forces. With conventional forces, these actions—all highly publicized—include accelerated development of improved weapons specialized for this mission, visible weapons testing, rapid modification or procurement of these weapons, construction of mirror-image Iranian target arrays at our test ranges, intensive training with live weapons against these targets (shown on prime-time television), focused counterproliferation exercises, announced deployments, increased readiness, elevated worldwide alert levels, and so on.

Where do nuclear weapons come in? Because they're so all-powerful, devastating, and unique—a force that the adversary cannot withstand—nuclear weapons represent the real power in our deterrence. They provide a fearsome, credible backdrop for our conventional forces. Our reinforcing measures with nuclear weapons include immediate resumption of testing nuclear weapons underground as well

as accelerated design, testing, and production of new nuclear weapons with very low yield, great accuracy, reduced collateral damage, and increased security and controllability. We tailor individual designs for earth penetration, reduced residual radiation, and so on—all with much publicity, visibility, training, and exercises. The intensity of reinforcing actions cannot be overemphasized. Think back to the Cold War. The design and production of every nuclear weapon and every delivery vehicle (missile, aircraft, and submarine), as well as the assembly of large military forces that man and operate them, should be considered as reinforcing actions, to demonstrate national capability.

If we used deterrence in this manner today, Iran would abandon its nuclear-weapons programs without our firing a shot. Note that without the above-mentioned preparation, we could still make the declaratory statement and carry out the same reinforcing actions—which would probably not convince Iran that we would carry out our threat. In this case, we should conduct a single, very powerful conventional strike (earlier rather than later) against only one target—say, the Natanz enrichment facility. Immediately thereafter we should invite Iran to the negotiating table, at which our carrots should carry the day.

Deterrence is highly case-specific. That is, we must precisely shape any attempt to deter an adversary by holding at risk his most valued assets, and it must be totally credible under current US and world conditions. A deterrent approach that works against adversary "A" won't work against adversary "B"; moreover, one that works against adversary "A" today won't work against him in three years.

But US nuclear deterrence doesn't exist today. Although it represents the strongest element of US foreign policy and national security strategy, we've

dropped it from our tool kit. Our strategists, diplomats, and military don't understand it, and we've taken none of the necessary preparatory actions to make it credible. Some of these actions concern the nuclear-weapons arsenal we need to back up deterrence.

Our Failing Nuclear-Weapons Capability

US nuclear-weapons capability is in near-terminal condition: neglected, deteriorated, and dying. In the 1970s and '80s, it was the strongest the world had ever seen. What happened?

Briefly, in the euphoria over the Cold War's end, with the perceived absence of serious threats and a vision of peace for the foreseeable future, the United States took a number of unilateral nuclear-disarmament actions (e.g., a moratorium on the testing of nuclear weapons, a law prohibiting the design of low-yield nuclear weapons, and signing of the Comprehensive Test Ban Treaty [CTBT]). Today it's clear that we vastly overshot the mark.

New adversaries quickly appeared: rogue states, failed or failing states, terrorist organizations based in sanctuary states, and powerful groups with the potential to take over weak states. Many adversaries have no greater desire than to kill Americans and destroy our society—and they're eager to die in the process. They are also absolutely determined to acquire nuclear weapons in order to kill more of us. So our rosy vision of the future was off the mark. We repealed the design law after a decade of terrible injury to our nuclear labs, and the Senate denied ratification of the CTBT by a wide margin; however, the test moratorium continues, and it has done incalculable damage.

For almost 50 years, testing represented the hub of the nuclear-weapons wheel—"ground truth." It was the way we pursued science, trained designers,

validated designs, certified warheads, found problems, identified fixes, verified solutions, integrated the Department of Defense (DOD) and predecessors of the National Nuclear Security Administration into a tight-knit user-producer community, and the way we hardened key DOD weapons systems to survive the effects of nuclear weapons. With the hub gone, the remainder of the wheel isn't of much use.

And our mistakes continued—probably the second greatest being our belief that any US nuclear-weapons activity would undercut our nonproliferation policy. The exact opposite is true. A strong US nuclear deterrent acts as a powerful force to prevent proliferation. Unfortunately, United Nations (UN) stewards of nonproliferation progressively changed the objective of the "global nonproliferation regime" from preventing proliferation to nuclear disarmament. Accepting this, the US Congress, over the past decade, has denied all of the executive branch's nuclear initiatives: advanced-concepts research, the modern pit facility (the plutonium trigger), enhanced test readiness, the robust nuclear earth penetrator, and the reliable replacement warhead.

Today, nuclear threat levels are high, and the dangers diverse and even more challenging; yet US nuclear-weapons capability is close to total failure. We have undergone a two-decade, unannounced "nuclear freeze," taking us well on the way to unilateral nuclear disarmament:

- Our nuclear deterrent doesn't deter. Our stockpile consists of Cold War "massive retaliation" weapons, irrelevant against current adversaries, and the test moratorium denies us the capability to design new, appropriate, and credible counter-proliferation weapons.
- The absence of nuclear testing seriously reduces our confidence in the reliability and performance of existing nuclear weapons because of

ageing, radiation damage, deteriorated parts, replacements with untested parts, and so on.

- In this age of terrorism, our nuclear weapons must incorporate the very best in safety, security, and controllability, but we cannot do this without nuclear testing. Most warhead designs do not contain all of the available security systems, and we have not developed improved systems because we have no prospect for testing them.
- From the dawn of the nuclear era, no nuclear-warhead design has ever entered the stockpile without having the pit certified through nuclear testing—until last year. We’re now in the very unwise process of side-stepping this bedrock policy.
- Lab scientists, designers, engineers, and test personnel with test experience are almost gone. Those left can be counted on one hand. Morale is low. The luster of a nuclear-weapons career has diminished to the point that it impairs the recruiting of high-potential individuals. Furthermore, effective training of the new generation is just not possible without nuclear testing.
- For 17 years, our nuclear-weapon scientists have been prevented from pursuing a robust advanced-concepts research program. In this era of rapidly advancing technology, the test moratorium has denied us knowledge of “what’s possible?” and an understanding of new threats we may face.
- The crown jewels of America’s nuclear-weapons capability are not our warheads, weapons, or stockpile but *our designers of nuclear weapons!* We depend totally upon the judgment of designers to resolve every question, issue, or unknown regarding the effectiveness and reliability of each weapon. And designers learn their trade by *testing*, without which we’ll have the blind leading the blind.
- The inability to test undermines American science. For centuries, employment of the “scientific method,” with testing as its central element, has been responsible for mankind’s scientific and technological advances. We define a problem or unknown; develop a hypothesis for its solution; design a test of the hypothesis; predict test results; run the test; compare actual results to those predicted; adjust the hypothesis based upon test differences; and repeat the process. We cannot do this without testing. In a field as important as nuclear weapons, our scientists must not be denied use of the scientific method.
- Much of our nuclear-weapons infrastructure (laboratories, test facilities, production plants, etc.) is antique and deteriorated. The heart of the nuclear-weapons business—the production of plutonium pits (triggers)—no longer exists. The Rocky Flats plant closed 20 years ago, and every attempt to build a modern pit facility has been stopped.
- Similarly, the DOD has disassembled its nuclear-weapons capability by closing offices, reassigning specialists, and terminating functions. Few young officers today seek advanced degrees in nuclear physics or engineering, and few become nuclear-weapons specialists. Little attention is given to strategic thinking about nuclear weapons; development of tactics; strategy games involving nuclear weapons; and military exercises featuring nuclear warfare.
- Without nuclear testing, survivability of the DOD’s conventional and nuclear systems remains



largely unproven. Scientific research into the effects of nuclear weapons has atrophied, and we now have little capability to test US systems against these effects.

- This situation is possibly best summarized by Secretary of Defense Robert Gates, who recently stated that “no one has designed a new nuclear weapon in the United States since the 1980s, and no one has built a new one since the early 1990s. . . . The United States is the only declared nuclear power that is neither modernizing its nuclear arsenal nor has the capability to produce a new nuclear warhead.”¹ Each of the three processes involved (designing, testing, and producing) is a performance art; each requires a highly specialized team; and the teams have to work closely together. It will take many years of actual performance to relearn how to do it effectively.

Most of these degradations result primarily from the absence of testing, and most of them cannot be corrected without the resumption of testing. So let's look next at the world of nonproliferation, which caused the test bans and moratoria.

The Failure of Nuclear Nonproliferation

The proliferation of nuclear weapons is a threat like no other, and America has led the effort to prevent it from the start. The Baruch Plan and President Eisenhower's Atoms for Peace were notable beginnings. In the 1960s, the United States actively negotiated the Nonproliferation Treaty (NPT), seeking to prevent proliferation by limiting nuclear weapons to the existing five “nuclear-weapon states” (United States, United Kingdom, Soviet Union, China, and France—the five permanent members of the UN Se-

curity Council). In 1970 43 states signed the NPT, including the United States. Five signed as nuclear-weapon states, and the rest as non-nuclear-weapon states, as did all later signatories.

The NPT places no restrictions on the five nuclear-weapon states regarding developing, testing, producing, and deploying new nuclear weapons in any variety or numbers—and every signatory agreed to this. Currently 189 (of the 193) states have signed the NPT, and there are still only five approved nuclear-weapon states. The NPT represents the cornerstone of the prevention of global proliferation.

During the Cold War (which continued for the first two decades of the NPT's life), relatively little proliferation occurred, primarily because the tens of thousands of instantly ready US and Soviet nuclear weapons made acquiring them seem rather pointless. Eighteen nations started down the nuclear-weapons road, and all stopped.

The problems with the NPT occurred once the Cold War ended. Groups of states, activist organizations, arms controllers, antinuclear organizations, and so on, have piggybacked their objective—nuclear disarmament—onto “nonproliferation,” effectively hijacking the term. They didn't change the treaty itself; they just claim that it requires nuclear disarmament, which it does not.

Over the years, the UN, General Assembly, Conference on Disarmament, large blocs of states, and countless non-government organizations have totally shifted the NPT's focus from preventing proliferation to nuclear disarmament. Thus, for the past 20 years, the world has sought to force the United States (the soft touch) to move faster toward unilateral nuclear disarmament and has given little attention to preventing rogue states from acquiring nuclear weapons. Consequently, the NPT failed to stop first Pakistan, then North Korea, and now Iran from going nuclear. Clearly, nonprolif-

eration—as practiced today—is ineffective, dying.

If North Korea solidifies its nuclear-weapons status, it's likely that other neighboring states (e.g., Japan, South Korea, and Taiwan) will opt to go nuclear in self-defense. If Iran produces nuclear weapons, the same will probably occur with Egypt, Saudi Arabia, Turkey, and other Mideast states. These two regional nodes of proliferation will likely trigger global proliferation among both developed nations (which can make the move very quickly) and undeveloped ones (some 40 of which have already made early moves toward nuclear power, many probably regarding it as a preparatory step). This appalling prospect has caused some individuals and groups to grasp, in desperation, for the impossible—"a world without nuclear weapons."

A World without Nuclear Weapons

Sensing the likelihood of a global cascade of proliferation, two and a half years ago, four notable elder statesmen—George Shultz, Henry Kissinger, Bill Perry, and Sam Nunn—proposed the international objective of a world without nuclear weapons. They stated that they did not know how to get there, but they proposed a series of major nuclear-disarmament actions that should be taken (mostly by the United States) to stimulate other nations to follow suit.

Of course, arms controllers, disarmers, and the entire global nonproliferation regime seized upon this vision with delight, holding conferences, planning initiatives, forming alliances, writing articles, and reshaping other related movements into this one. A parallel international program, Global Zero, came into being. Recently, President Obama has publicly committed his administration to a world without nuclear weapons.

In the resulting euphoria and enthusiasm, no one is asking searching ques-

tions. We *must* ask—and answer—them before taking any action in such a huge and daunting endeavor:

- Is a world without nuclear weapons possible? Surely, we must answer this one before we start taking major actions that may have serious downsides or that may be irreversible.
- Is a world without nuclear weapons desirable? Regulation and enforcement have always proven essential in a civilized society.
- What dangers would we expose ourselves to? Our nuclear deterrent has kept us safe for half a century.
- If we achieved a world without nuclear weapons, how would we stay there? Basic nuclear-weapons technology is well understood worldwide.
- How would we verify compliance? It appears impossible.
- Since proliferation *increased* during the exact period when the United States was in a nuclear freeze, refraining from design and production of nuclear weapons and making draconian reductions in our stockpile, why should we believe that our making further reductions will *stop* proliferation? It seems clear that weakness is not the way to win the nonproliferation game.
- Is it not unwise for a nation to set an objective it does not know how to reach? Major commitments of time, people, and money may turn out to have been counterproductive.
- Do we have more effective alternatives for preventing proliferation? Simple enforcement of nonproliferation seems obvious.

Without addressing these questions, the Obama administration is moving forward rapidly with a large number of proposals to implement this vision of nu-



clear disarmament. Three in particular, planned for this year, are quite dangerous. First, ratifying the CTBT would condemn us permanently into living with irrelevant nuclear weapons as well as inexperienced nuclear-weapons scientists and engineers. Second, making major reductions in the number of weapons in our stockpile is unwise. We're still in the process of implementing the huge Moscow Treaty reductions by 2012, and we should stabilize there until our still-in-planning "responsive infrastructure" is in place to compensate for the reductions. Third, permanently canceling the reliable-replacement-warhead program—the only modernization program attempted by the United States in two decades—is extremely unwise. We've committed five years to preliminary development of this warhead, essential both to reconstituting the human capital of our industrial base and to extending the life of our overage weapons.

Historically, efforts to ban weapons have been unblemished by success. We would do well to examine the records carefully before launching such an ambitious undertaking. One of the most recent attempts is also one of the most instructive—the Kellogg-Briand Pact to outlaw war as an instrument of national policy, signed in 1928. Virtually all the major nations of the world subsequently subscribed to it. This occurred as these same nations prepared for World War II, the most destructive war in history, leaving over 60 million dead.

An ill-conceived initiative, "a world without nuclear weapons" cannot succeed. Rather, it would expose us to imminent real-world threats, prevent the urgently needed rebuilding of our decayed nuclear-weapons capability, and fail to stop the impending cascade of proliferation.

Path to a Successful Future

We can survive this perfect storm and secure a safe future by taking the fol-

lowing five major steps, appearing in priority order.

Forget about a World without Nuclear Weapons

Starting with the physicians' guide "first, do no harm" (although it may damage a few egos), we must drop the "world without nuclear weapons" objective and cancel the three ill-advised 2009 proposals designed to kick it off (listed above). We cannot realize this objective, however visionary and desirable, and these three early actions would do incalculable damage to our nation.

Stop Nuclear Proliferation

We must stop nuclear proliferation, the principal threat facing our nation—*now*. If we can hold the line at eight states with nuclear weapons, the world may, with luck, be able to manage the nuclear-weapons challenge for the long-range future.

North Korea's and Iran's nuclear ambitions, along with the world's weakness in handling this challenge over two decades, caused the current proliferation crisis. Now we are truly in extremis. If these two states succeed in going into production with nuclear weapons, proliferation will cascade. Many, many states will have them; terrorists will obtain them; they will see frequent use; and we will live in a world of nuclear horror and chaos from which there is no return.

We can avoid this only by stopping North Korea and Iran now—by military force, if necessary. This is an absolutely essential step, and we must take it. Actually, the cascade has already started, in a subvisibility manner, in anticipation that no one will stop the two rogues. We should first attempt deterrence, although without the years of preparation, it may well prove unsuccessful. But if we must use force, the cost of stopping these two rogue-state proliferators now will amount to only a tiny fraction of the future cost of not stopping them.

When the first of these states is forced to roll back its nuclear-weapons program, this action will create a whole new world. Nonproliferation will be alive and well. Once again, deterrence will be recognized as effective. Nations of the world will no longer feel threatened by nuclear aggression. We can achieve nonproliferation only by stopping proliferators.

Then we must convince the world of three realities. First, *nonproliferation requires enforcement!* There must be a cop on the beat. Ideally, this would become a collegial responsibility of the five NPT-approved nuclear-weapon states—and the world may eventually evolve to this point. But for now, the United States must take the lead, supported by those willing to help—hopefully, one or more of the other nuclear-weapon states. Second, nuclear weapons are of indispensable value. They ended the most destructive war in history, saving millions of lives. For almost half a century, they prevented a vastly more destructive war. Today, the presence of nuclear weapons in some hands acts as a damper on their use by others. For generations to come, having nuclear weapons in the hands of large, responsible states offers the only hope for the world. Third, the true beneficiaries of the NPT's inequality are not the five nuclear-weapon states, who shoulder a heavy burden, but the 180-odd non-nuclear-weapon states. The NPT protects them from threats by aggressive nuclear-armed neighbors.

Reestablish Nuclear Deterrence

For two decades, America has forgotten about deterrence, our most powerful foreign policy and national security tool. We must recover it and totally recast our nuclear-deterrence strategy to face current realities. The following five examples illustrate the immense scope of change needed to reach a new model of deterrence. In the Cold War, our objective was to deter the launch of nuclear weapons against us and our allies. Now, our pri-

mary objective must be to deter the acquisition of nuclear weapons by rogue states and proliferators. In the Cold War, we threatened retaliation. Now, to avoid immense damage, we must threaten preemption. In the Cold War, we threatened to use nuclear weapons. Now, we should threaten to use military force. In the Cold War, we threatened to target leadership, military forces, and nuclear weapons. Now, we should target, for example, facilities that produce nuclear weapons. In the Cold War, we considered our strike the onset of war. Now, we should consider our strike an element of the negotiating process.

Rebuild Our Nuclear-Weapons Capability

We must repair the widespread damage of a two-decade nuclear freeze. The president must issue a firm, clear statement to the effect that an *effective*, safe, secure, and reliable nuclear deterrent is essential to America's security, and that we will maintain it with the highest priority. We must then immediately repair the widespread damage by taking the following actions:

- Reestablish the reliable replacement warhead as a vital program to rebuild human capital and begin modernization.
- Initiate a national debate to inform the American people of the issues discussed in this article, leading to the strong public consensus and bipartisan majorities needed to carry the program through decades of recovery.
- Reestablish a continuing, robust research and development program in all fields contributing to advanced nuclear weapons.
- Terminate our unilateral test moratorium, leave the CTBT unratified, and establish the international understanding that the CTBT does not

apply to the five NPT-approved nuclear-weapon states.

- Revitalize the DOD's nuclear-weapons organizations and programs, recommending the establishment of military requirements for new nuclear weapons to return credibility to our nuclear deterrence.
- Design, test, and produce new nuclear weapons needed for all national deterrence missions.
- Modernize our nuclear-weapons infrastructure to produce a smaller, less costly, more efficient enterprise, giving top emphasis to pit production.
- Revitalize the DOD's programs on the effects of nuclear weapons, including underground testing, to ensure nuclear survivability of vital military and civil systems.

Pursue Responsible Arms Control

In a proliferation-free world, we must lead the eight nations possessing nuclear weapons into a continuing series of verified reductions, with the goals of maintaining stability and ensuring that the five NPT-approved nuclear-weapon states have the nuclear capability to maintain order.

In sum, the five steps outlined above should successfully respond to the five challenges of our nuclear perfect storm, reestablishing our essential nuclear deterrent and creating an effective global program to prevent proliferation. ✪

Note

1. Secretary of Defense Robert M. Gates (speech to the Carnegie Endowment for International Peace, Washington, DC, 28 October 2008), <http://www.defenselink.mil/speeches/speech.aspx?speechid=1305> (accessed 9 June 2009).



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