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THE DANGER OF PROLIFERATION OF NUCLEAR WEAPONS

The existing international regime, grounded in the nuclear NonProliferation Treaty for preventing new nuclear weapon states, reducing existing nuclear arsenals, and controlling the spread of nuclear technology and material, is seriously endangered.

The inevitable spread of technology, particularly uranium enrichment and plutonium reprocessing technology for civilian energy, creates the danger of more states with nuclear arms and fissile material. In turn, it provides more opportunities for theft or sale to terrorist groups or other societal units unrestrained by accepted norms of civilized behavior, thereby increasing the risk that nuclear weapons will be used.

Beyond North Korea and Iran more than 40 nations already have taken substantial steps forward in nuclear technology. Even more have indicated interest in developing such technology for civilian power. And once you can enrich uranium for a civilian power reactor – you are well on the way. If we continue on the present course the United States and the world soon will be compelled to enter a new nuclear era that will be more precarious and economically costly than was Cold War deterrence.

REDUCING NUMBERS OF NUCLEAR WEAPONS

During the Cold War, nuclear weapons were essential to maintaining international security because they were a means of deterrence. Sixteen years ago the Cold War ended with the demise of the Soviet Union, and with it, the doctrine of mutual Soviet-American deterrence became obsolete. Deterrence continues to be a relevant consideration for many states with regard to threats from other states. But reliance on nuclear weapons for this purpose is becoming increasingly hazardous and decreasingly effective as the prospect of nuclear proliferation grows increasingly ominous. The time is overdue for a fresh look at the role of nuclear weapons in U.S. defense planning.

The United States and Russia have now officially adopted a policy of cooperation against the new threats, faced by both nations, of terrorists and unstable or irresponsible governments acquiring nuclear weapons. This replaces the former adversarial relationship of nuclear deterrence based on mutual assured destruction. As stated in the Joint Declaration of Presidents Bush and Putin on November 13, 2001: "The United States and Russia have overcome the legacy of the Cold War. Neither country regards the other as an enemy or threat." They emphasized that the two nations are allies working together against the spread of nuclear weapons in a "new strategic relationship……that is cooperative rather than adversarial."

In light of this official change in policy, I have trouble understanding why we still seem to be planning under the Treaty of Moscow, or SORT, negotiated with Russia in 2002, for 1700 to 2200 deployed nuclear warheads in 2012, supplemented by several thousand more reserves in the stockpile. What are they for?

Potential targets in Russia, as described by the Department of Defense's 2001 Nuclear Posture Review, are "the instruments of political control and military power…, leadership and military capabilities, particularly weapons of mass destruction, military command facilities and other centers of control and infrastructure that support military forces." Their

total number is perhaps 200 to 300, assuming that Russia reduces its nuclear forces in parallel with the United States. Based on this estimate, and taking into account the new relationship with Russia that President Bush has proclaimed, a U.S. strategic force of some 500 operationally deployed strategic warheads would be more than adequate[1]. This number allows for force readiness concerns, multiple targeting where needed, and the possibility of very sudden and unexpected surprises from Russia, for example, a breakdown in its military command and control caused by technical failures or a takeover by renegades.

In order to provide a considerable degree of flexibility in a fluid security environment, as called for in the Nuclear Posture Review, the 500 operationally deployed strategic warheads would be augmented by a Responsive Force. These additional warheads would be configured in two parts, the first able to respond to a rapidly building crisis – a Ready Responsive Force – and the second able to respond to strategic warning signals on a timescale of a year or more – a Strategic Responsive Force. This use of the Responsive Force underscores the need for sustaining an infrastructure for supporting it, as well as the need to provide this force with appropriate hardening and concealment.

As we look ahead a few years into the future, the total Responsive Force should have 400 – 500 warheads, a number comparable to the operationally deployed one. This number would be adequate to target roughly several hundred additional Russian sites, for example, those affecting industrial recovery – the major nodes in the electric power grid and air, ground, and rail transportation systems, as well as major industrial sites. These targets and the forces to attack them may be viewed, we hope, as only temporary remnants of the Cold War policy of assured destruction that may be discarded before long in the dustbin of history.

In sizing our nuclear forces for the future, the United States and Russia, who presently possess more than 90% of the worldwide total of nuclear weapons, will have to enter into multilateral negotiations with the other nuclear weapon states as we make significant force reductions. The warhead numbers I have proposed above assume that such negotiations are successful in establishing nuclear restraint elsewhere in the world.

In making these reductions the United States should maintain the existing triad of strategic nuclear delivery systems—bombers plus land-based and sea-based ballistic missiles—to avoid common failure modes and vulnerabilities. There is value in retaining this diversity as the total stockpile is decreased as a way of preserving flexibility and confidence in reliability, so long as operational costs do not exceed their perceived value.

As Russia and the United States move farther away from the nuclear deterrence trap in which we are still ensnared, the sizing of our stockpiles would depend on other concerns and could be further reduced. In time, nuclear deterrence might be maintained entirely with a Responsive Force without an operationally deployed force. That Responsive Force could consist of considerably fewer than 1,000 warheads, perhaps no more than the 500 that are proposed initially to be in the operationally deployed force[2].

Moving ahead expeditiously with reductions in our strategic forces would help Russia and the United States work more cooperatively against the looming threat of nuclear weapons proliferation into dangerous hands. Bold actions by the two powers that still possess more than 90 percent of the world's nuclear warheads would be a powerful stimulus toward preserving and further strengthening a nonproliferation regime that is presently under severe strain, particularly, but not exclusively, from Iran and North Korea. In order to give

[1] This discussion is based on a study by Sidney D. Drell and James E. Goodby: "What Are Nuclear Weapons For? Recommendations for Restructuring U.S. Strategic Nuclear Forces," (2005 report of the Arms Control Association)http://www.armscontrol.org/pdf/USNW_2005_Drell-Goodby.pdf

[2] A more comprehensive discussion of this issue is presented in Reference (1), which includes a notional force posture for illustrative purposes.

impetus to prospects for achieving further reductions in strategic nuclear forces below the levels outlined in SORT, the United States and Russia will have to negotiate an extension or revision of the formal provisions for verifying such measures that are currently slated to expire in December, 2009 with START. There is little time for delay in getting started on this effort.

MODERNIZATION AND RRW

Beyond numerical reductions in our nuclear forces, measures of restraint by the United States in managing and modernizing our nuclear arsenal will also be important to achieving success in meeting challenges to the nonproliferation regime.

If the US, the strongest nation in the world, were to conclude that it cannot protect its vital interests without relying on new nuclear weapons for new military missions, it would be a clear signal to other nations that nuclear weapons are valuable, even necessary, for their security. It would also be counter to the nonnuclear states' repeated urging that the nuclear states reduce reliance on nuclear weapons, reduce the numbers of weapons, and work toward ratifying the Comprehensive Test Ban Treaty. Indeed, at the United Nations in 1995, many nonnuclear nations set those terms as conditions for their agreeing to extend the NPT indefinitely.

Following the rejection of two programs for new bombs, a high-yield "bunker buster" and a low-yield new concepts warhead, Congress is considering the scope of a different program, the Reliable Replacement Warhead (RRW) program proposed by the Bush Administration. The RRW's stated purpose is to transform both the nuclear infrastructure and the nuclear weapons themselves so that the US can maintain long-term high confidence in its arsenal as it reduces the arsenal's size. The program's proponents state that the transformation will require a modernized infrastructure and new warhead designs.

The part of the RRW program that is directed at transforming the nuclear infrastructure is important and generally not controversial. The infrastructure needs serious attention. Much of it dates back to the beginning of the Cold War, or even to World War II. No matter how optimistic the nation's policymakers, scientists, and citizens, no matter how effective in the pace of reducing our arsenal, as long as the US has nuclear weapons it must be able to maintain confidence in the safety and reliability of the warheads in the shrinking stockpile. However, in planning a modernized nuclear complex that will be more efficient, flexible, and environmentally friendly to maintain, we need to decide first: How big an arsenal do we think we need? This will require developing an updated plan for the future U.S. nuclear policy and force posture as called for by this committee.

The more difficult and contentious part of the RRW program is the transformation of the current stockpile with newly designed warheads that will increase long-term reliability, safety, and use control – i.e. preventing our weapons from being exploded against us if they are acquired by terrorist actions. It is a daunting challenge to achieve these goals, all without resuming underground nuclear explosive tests in order to certify the newly designed warheads for deployment. Restrictions against resuming such tests have been imposed in legislation authorizing the RRW program. They are important to many nonnuclear nations around the world whose cooperation against nuclear proliferation the United States needs; and whose concerns about the seriousness of the nuclear powers' commitment to limiting their nuclear efforts in accord with the NonProliferation Treaty (NPT) cannot be ignored, denied or dismissed as irrelevant. Many nonnuclear states strongly registered such concerns in negotiations at the United Nations in 1995, when they agreed to continue the NPT indefinitely into the future. As a condition for their support, as I mentioned earlier, they called on the nuclear powers to ratify a CTBT and restrain our nuclear programs in order to

ameliorate the present discriminatory situation between the nuclear powers and the nonnuclear states who are proscribed by treaty from developing any nuclear forces.

We are faced with a key question: Can we achieve the goals of the RRW program without underground explosive testing? In developing its modern arsenal, the US has performed more than 1000 explosive tests over a period of 50 years. How confident could one be in certifying a new weapon that doesn't have a strong pedigree based on that nuclear test program? The ongoing vigorous and highly successful Stockpile Stewardship and Life Extension programs have established that the US stockpile of nuclear weapons is safe and reliable and does not show significant evidence of aging. And, in the context of those programs, the directors of Los Alamos, Lawrence Livermore, and Sandia National Laboratories, the three weapons labs, have, for the past decade, annually certified the stockpile to be safe and reliable. Those programs also include important improvements in nonnuclear components – for example, continually improving the safety of the arming, fusing, and firing system and enhancing performance margins.

I don't think that we presently know the answer to the key question I posed: we are not technically certain what aspects of an RRW program can be achieved without nuclear explosion testing. I do believe it is a worthwhile question to try to answer and a sensible approach to it should include the following three elements.

First, RRW needs to proceed carefully with research on design modifications before moving ahead to the development and manufacture of new warheads. Detailed analyses, subjected to independent scrutiny and rigorous peer review, will be needed to determine whether it is possible to build confidence and a strong technical consensus that the proposed changes are mutually compatible and have the appropriate test pedigree from previous work in developing the current stockpile. Before moving beyond the phase 2a, we must be able to convince ourselves that we will be able to place higher confidence in the reliability and effectiveness of new RRW designs, without underground explosive tests, than in our existing, well-tested warheads.

It would be an important action for the United States to strengthen the existing moratorium on underground nuclear tests by moving ahead to ratify the CTBT—a treaty that we were the first to sign in 1996 but have since failed to ratify. Such an action would strengthen our leadership role in strengthening the nonproliferation regime. But more than that, it would add an important technical strength to the ability to verify worldwide compliance with a ban on testing by bringing into force the full power of the International Monitoring System of hundreds of detection sensors around the world.

Second, we must recognize that implementing design changes is not time urgent – the legacy stockpile is strong. The pace of the work should not consume human and budgetary resources to the extent of savaging the important and highly successful Stockpile Stewardship and Life Extension programs.

Third, the government needs to be clear about the limited scope of the RRW program so as to avoid potentially harmful impacts on global nonproliferation efforts.

THE LONG TERM CHALLENGE

So far I have discussed the immediate challenge to prevent the proliferation of nuclear weapons from getting out of control. There is also a long term challenge that I would like to comment on briefly. It is the challenge to develop a strategy for removing the nuclear threat that hangs over our heads and achieving a world-free of nuclear weapons. That is a goal addressed by every American president since Dwight Eisenhower. It was the vision that President Reagan and General Secretary Gorbachev brought to their remarkable summit at Reykjavik in October, 1986, more than twenty years ago.

The challenge to rekindle the vision of Reykjavik, and to develop a strategy to realize it, was addressed at a conference that former Secretary of State George P. Shultz, who participated in that summit, and I organized last October at Stanford University's Hoover Institution. We reviewed the impact of Reykjavik and its relevance for today's world, and formulated a set of practical steps to define a path toward ridding the world of nuclear weapons.

The conclusions of the conference were summarized in an article, "A World Free of Nuclear Weapons," that appeared in the *Wall Street Journal* on 4 January 2007. The article was signed by Shultz, William Perry, Henry Kissinger, and Sam Nunn and endorsed by most of the conference participants, who also signed on to the article. First and foremost, the article emphasized the need for intensive work with leaders of the countries in possession of nuclear weapons, both to turn the goal of a world without nuclear weapons into a joint enterprise and to create a working mechanism for accomplishing that goal. Such a joint enterprise, by involving changes in the strategic assumptions and attitudes of the states possessing nuclear weapons, would lend additional weight to efforts already under way to avoid the emergence of a nuclear-armed North Korea or Iran.

The program developed at the Hoover Institution conference constitutes a series of urgent steps for which agreement should be sought. Such steps, as described[3] in the *Wall Street Journal* include:

- Changing the cold war posture of deployed nuclear weapons to Increase warning time and thereby reduce the danger of an accidental or unauthorized use of a nuclear weapon.
- Continuing to reduce substantially the size of nuclear forces in all states that possess them.
- Eliminating short-range nuclear weapons designed to be forward-deployed.
- Initiating a bipartisan process with the Senate, including understandings to increase confidence and provide for periodic review, to achieve ratification of the Comprehensive Test Ban Treaty, taking advantage of recent technical advances and working to secure ratification by other key states.
- Providing the highest possible standards of security for all stocks of weapons, weapons-usable plutonium, and highly enriched uranium everywhere in the world.
- Getting control of the uranium enrichment process, combined with the guarantee that uranium for nuclear power reactors could be obtained at a reasonable price, first from the Nuclear Suppliers Group and then from the International Atomic Energy Agency (IAEA) or other controlled international reserves. It will also be necessary to deal with proliferation issues presented by spent fuel from reactors producing electricity.
- Halting the production of fissile material for weapons globally; phasing out the use of highly enriched uranium in civil commerce and removing weapons-usable uranium from research facilities around the world and rendering the materials safe.
- Redoubling our efforts to resolve regional confrontations and conflicts that give rise to new nuclear powers.
- Addressing the requirements for effective measures to impede or counter any nuclear related conduct that is potentially threatening to the security of any state or peoples.

[3] See also Sidney D. Drell, "The Challenge of Nuclear Weapons" (Physics Today, vol. 60, no. 6, June, 2007)

Reassertion of the Reykjavik vision of a world free of nuclear weapons and practical measures toward achieving that goal could have a profoundly positive impact on the security of future generations. Without the bold vision, the actions will not be perceived as fair or urgent. Without the actions, the vision will not be perceived as realistic or possible.