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Reductions without Regret: Summary

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John A. Swegle

Douglas J. Tincher

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Savannah River National Laboratory
Aiken, SC 29808

John A. Swegle, 735-11A, Room 113, (803)725-3515

Douglas J. Tincher, 735A, Room B102, (803)725-4167

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John A. Swegle and Douglas J. Tincher
Savannah River National Laboratory

Introduction

Three factors are now shaping the evolution of the U.S. nuclear force: (1) the pursuit of nuclear-weapon reductions below current levels for all weapon types – strategic and non-strategic, deployed and non-deployed;^{1,2} (2) modernization of a nuclear force developed during the Cold War and shaped by Cold-War politics and post-Cold-War expectations; and (3) diversification of nuclear deterrence from the bilateral Cold War standoff to a bi-level global-regional model. This third factor was implicitly acknowledged in the 2010 *Nuclear Posture Review Report*,³ which numbers among its objectives

- Maintaining strategic deterrence and stability, and
- Strengthening regional deterrence and the assurance of our allies and partners.

The process of modernizing while reducing, in the face of a diversifying threat, is further complicated by the expected lifetimes of replacement systems, which can reasonably be expected to serve into the next century if necessary. Under the circumstances, it is essential that, to the maximum extent possible, flexibility be preserved, allowing both for *scalability downward* as the force size is reduced, the more likely course of action under current circumstances, or for *breakout responsiveness* if necessary, should circumstances change significantly for the worse – or perhaps the different – in the future.

In facing the dual processes of modernization and force reductions, a particular concern is that “box canyons,” “roach motels,” and “wrong turns” be avoided (see the text box for definitions). Each is problematic, with differing degrees of reversibility. In a following series of three papers, for which this is a brief summary, we consider the possibilities for losing, or compromising, key capabilities of the U.S. nuclear force in the face of modernization and reductions. The first of the three papers in the following series takes an historical perspective, considering capabilities that

were eliminated in past force reductions. The second paper is our attempt to define the needed capabilities looking forward in the context of the current framework for force modernization and the current picture of the evolving challenges of deterrence and assurance. The third paper then provides an example for each of our undesirable outcomes: the creation of roach motels, box canyons, and wrong turns.

We close this paper with a brief summary of each of the following three papers. Before we do so, however, we first review the stated goals for reduction, the driving forces, and the long-term goals.

Definitions

Roach Motels of Reduction: Dead ends in force development that are irreversible due to certain combinations of factors.

Box Canyons in the Valley of Disarmament: Courses of action resulting in undesirable force compositions or structures that can be reversed, albeit at the expense of “going back the way one came in.”

Wrong Turns on the Road to the Future: Courses of action creating undesirable force compositions or structures that can be undone by a change of direction.

Goals for Reduction

The 2010 *Nuclear Posture Review Report*⁴ frames the tension between reductions, stability, and deterrence in its five key objectives:

1. *Preventing nuclear proliferation and nuclear terrorism;*
2. *Reducing the role of U.S. nuclear weapons in U.S. national security strategy;*
3. *Maintaining strategic deterrence and stability at reduced nuclear force levels;*
4. *Strengthening regional deterrence and reassuring U.S. allies and partners; and*
5. *Sustaining a safe, secure, and effective nuclear arsenal.*

As we noted in opening, the current U.S. formulation aims to reduce all nuclear weapons, *strategic* and *non-strategic*, *deployed* and *non-deployed*. In this regard, strategic and non-strategic nuclear weapons are defined in terms of *range* (under the Intermediate-Range Nuclear Forces, or INF, Treaty, as well as New START, strategic nuclear missiles have ranges greater than 5,500 kilometers and thus global effect, while non-strategic weapons have shorter range and regional or theater effect); *delivery systems* (Strategic Nuclear Forces vs General Purpose or Tactical Dual-Capable Forces); and *release authority* (a national command authority *directs* the use of strategic nuclear weapons, but *authorizes* use of non-strategic nuclear weapons by a field commander). The distinction between deployed and non-deployed nuclear weapons was introduced in Article I of the Moscow Treaty (or SORT, for the Strategic Offensive Reductions Treaty), as “reentry vehicles on ICBMs in their launchers, reentry vehicles on SLBMs in their launchers onboard submarines, and nuclear armaments loaded on heavy bombers or stored in weapons storage areas of heavy bomber bases.”⁵ New START changed this rule by not separately counting nuclear weapons on bombers.

To put these definitions in perspective, on 3 May 2010, the U.S. Department of Defense publicly released a total number of 5,113 nuclear weapons in the U.S. stockpile.⁶ This count included operationally-deployed warheads, those ready to be deployed, and inactive warheads maintained stored with their tritium bottles removed. In comparison, on 3 April 2013, the U.S. State Department released a Fact Sheet stating that the number of deployed nuclear weapons according to New START rules (notably counting heavy bombers but not their armaments) was 1,654.⁷

While the START series and the Moscow Treaty have regulated strategic nuclear weapons, the treatment of non-strategic nuclear weapons has been less comprehensive: the INF Treaty eliminated a class of non-strategic nuclear weapons for the Soviet Union (now Russia) and the United States, and the unilateral, non-binding Presidential Nuclear Initiatives (PNIs) of 1991 and 1992 by Presidents George H. W. Bush, Mikhail Gorbachev, and Boris Yeltsin represented an only partially successful attempt to regulate non-strategic nuclear weapons.⁸

On the U.S. side, the motivations for nuclear arms reductions are shifting from bilateral arms control to bilateral *plus* multilateral considerations related to: nonproliferation in the context of the nonproliferation regime, counterterrorism in the context of nuclear-arms security, and nuclear disarmament in the context of the long-term goal of eliminating nuclear weapons. Therefore, the dual desires of the U.S. to

- Regulate and limit non-strategic nuclear weapons, and
- Shift the motivation from bilateral arms control to multilateral reductions in pursuit of nonproliferation- and counterterrorism-oriented objectives that include eventual nuclear disarmament,

seem to indicate a need for enhanced flexibility in two major areas. First, it requires the ability to execute both global (“strategic”) and regional (“tactical” or “non-strategic”) missions with an integrated force subject to regulation by treaty or agreement across the force. Indeed, if a comprehensive arms control agreement is desired, these future regulations could extend beyond the deployed nuclear force to include conventional strategic forces, missile defense, non-deployed warheads and launchers, and the production infrastructure. Second, in the absence of the achievement of a broader arms control agreement covering the NPT P-5 (the United States, Russia, China, France, and the United Kingdom), it requires a future nuclear force at presumably reduced size that retains flexibility allowing:

- Scalability downward in the event that further reductions are agreed upon, which defines a number of requirements, such as redundancy to guard against single-point failures, protection of viable career paths for the military personnel involved in the nuclear force, and provision of manageable “step sizes” for reduction;
- Reposturing to respond to changes in threat levels and to new nuclear actors, to allow for clear strategic messaging, and to reach a variety of targets even if additional forces are not needed; and
- Breakout response in the event that an adversary significantly increases its force size or force capability, which could involve upload capability, the ability to move non-deployed warheads or launchers back into the force, and the necessary production infrastructure, both built and latent. Potentially, breakout response could include the addition, or resurrection, of capabilities not resident in the current force.

Summarizing the Following Three Papers in this Series

The following three papers are aimed at providing a framework for evaluating future reductions or modifications of the U.S. nuclear force, first by considering previous instances in which nuclear-force capabilities were eliminated; second by looking forward into at least the foreseeable future at the features of global and regional deterrence (recognizing that new weapon systems currently projected will have expected lifetimes stretching beyond our ability to predict the future); and third by providing some examples of past or possible undesirable outcomes in the shaping of the future nuclear force, as well as some closing thoughts for the future.

Historical Perspectives

The next paper in this series examines the circumstances and consequences of the elimination of

- The INF-range Pershing II ballistic missile and Gryphon ground-launched cruise missile (GLCM), deployed by NATO under a dual-track strategy to counter Soviet intermediate-range missiles while pursuing negotiations to limit or eliminate all of these missiles.
- The Short-Range Attack Missile (SRAM), which was actually a family of missiles including SRAM A, SRAM B (never deployed), and SRAM II and SRAM T, these last two cancelled during an over-budget/behind-schedule development phase as part of the PNIs.
- The nuclear-armed version of the Tomahawk Land-Attack Cruise Missile (TLAM/N), first limited to shore-based storage by the PNIs, and finally eliminated in deliberations surrounding the *2010 Nuclear Posture Review Report*.
- The Missile-X (MX), or Peacekeeper, a heavy MIRVed ICBM. Deployed in fixed silos, rather than in an originally proposed mobile mode, Peacekeeper was likely intended as a

bargaining chip to facilitate elimination of Russian heavy missiles. The plan failed when START II did not enter into force, and the missiles were eliminated at the end of their intended service life.

- The Small ICBM (SICBM), or Midgetman, road-mobile, single-warhead missile, for which per-unit costs were climbing when it was eliminated under the PNIs.

Although there were liabilities associated with each of these systems, there were also unique capabilities, and our paper lays out the pros and cons for each. Further, we articulate the capabilities that were eliminated with these systems.

Defining the Needed Capabilities

The following paper in the series begins with a discussion of the current nuclear force and the plans and procurement programs for the modernization of that force. Current weapon systems and warheads were conceived and built decades ago, and procurement programs have begun for the modernization or replacement of major elements of the nuclear force: the heavy bomber, the air-launched cruise missile, the ICBMs, and the ballistic-missile submarines. In addition, the Nuclear Weapons Council has approved a new framework for nuclear-warhead life extension – not fully fleshed out yet – that aims to reduce the current number of nuclear explosives from seven to five, the so-called “3+2” vision. This vision includes three interoperable warheads for both ICBMs and SLBMs (thus eliminating one backup weapon) and two warheads for aircraft delivery (one gravity bomb and one cruise-missile warhead, thus eliminating a second backup weapon, one of the two existing gravity bombs).

This paper also includes a discussion of the current and near-term nuclear-deterrence mission, both global and regional, and offers some observations on future of the strategic deterrence mission and the challenges of regional and extended nuclear deterrence.

Wrong Turns, Roach Motels, and Box Canyons

In the final paper of the series, we provide one example each of our judgments on what constitutes a box canyon, a roach motel, and a wrong turn. Our judgments contain an element of the subjective, of course, which could well make them the subject of debate among other experts.

A Wrong Turn: The Reliable Replacement Warhead

The Reliable Replacement Warhead (RRW), a well-intentioned attempt to design and produce warheads based on tested nuclear components that would be cheaper and safer to build and maintain in the absence of nuclear testing, first appeared in the Fiscal Year 2005 (FY05) Federal budget and was defunded by Congress in the FY09 budget. There were a number of reasons for this outcome, including controversies over whether these were “new” weapons and the value of producing these weapons instead of continuing to refurbish and rebuild existing, tested weapons. In the end, though, this program pointed the way toward a new approach to the maintenance of the nuclear stockpile, a fact acknowledged in *The Final Report of the Congressional Commission on the Strategic Posture of the United States*⁹ and accepted in the *2010 Nuclear Posture Review Report*. The new framework proposed for the nuclear stockpile, the aforementioned “3+2” vision, shares a number of features and goals of the RRW for its missile warheads.

An Historical Roach Motel: SRAM T vs the B61

Even though the SRAM T development effort was in trouble at the time of its elimination in favor of the B61 as a tactical nuclear weapon to be delivered by tactical dual-capable aircraft, there were real advantages for a working SRAM relative to a tactically-delivered gravity bomb. Nevertheless, B61 has become the backbone of NATO nuclear-sharing and the existence of NATO as a nuclear alliance, and considerable money is being spent on the life extension and modernization of the B61. At this time, barring a serious deterioration of some aspect of the nuclear deterrence regime, SRAM is unlikely to reappear for the foreseeable future, except perhaps as a shorter-range, nuclear-armed modification of the new air-launched cruise missile, for which we coin the term N-SRSO (for nuclear short-range standoff, as opposed to the ALCM replacement, long-range standoff, or LRSO).

A Possible Box Canyon? A Low-Yield Version of the W76 SLBM Warhead

Recently,¹⁰ Elbridge Colby argued that U.S. interests are best served by the inclusion of a nuclear capability that is “limited, discriminate, and evidently restrained.” To fill this role, drawing on a suggestion by Ambassador Linton Brooks, he recommended that the best current option is a low-yield version of the W76 warhead carried on the Trident II SLBM. Even acknowledging the advantages he cites, as well as the standard criticisms that are to be expected for this new idea (a “new” weapon, more “usable, lack of a current requirement), we offer our own comments about the desirability of this particular response to an arguably unanswered regional deterrence question. We express three concerns relating to the ambiguity that a dual-capable system will be perceived as “evidently restrained;” the desirability of using a weapon otherwise regarded as strategic in a non-strategic role; and the perhaps greater desirability of employing a demonstrably non-strategic nuclear weapon in this role.

Final Thoughts: Options for the Future

This series, and the final paper in the series, close with some thoughts about options for the future, emphasizing three points:

- The current path for U.S. nuclear-force development points to a future force qualitatively similar to the force of today: a nuclear triad plus a gravity bomb delivered by T-DCA.
- Although perhaps not ideally suited to all possible anticipated global and regional deterrence situations, the current force is adequate, and foreseeable circumstances do not demand markedly different capabilities.
- Nuclear-force considerations are an element of a broader U.S. national-security policy that supports nonproliferation and arms control by aiming for the reduction of the role for, and the numbers of, nuclear weapons.

This context does not currently call for the development of new nuclear missions or weapons, although modifications that maintain the safety, security, and effectiveness of the existing arsenal are allowed. Nevertheless, we consider the kinds of changes in the security environment, creating alternative futures, that might necessitate the development of new capabilities in the nuclear force.

After brief considerations of the features of alternative futures that could necessitate change, the qualitative criteria affecting the perception of nuclear weapons in a deterrence role, and future options for strategic deterrence, we focus on the more complex problem of regional deterrence. In

this regard, we discuss at length the issues posed by, and possible responses to, three example regional deterrence challenges: in-country defensive use of nuclear weapons by an adversary; reassurance of U.S. allies with limited strategic depth threatened by an emergent nuclear power; and extraterritorial, non-strategic offensive use of nuclear weapons by an adversary in support of limited military objectives against a U.S. ally.

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