

Beyond the Moscow Treaty: Alternative Perspectives on the Future Roles and Utility of Nuclear Weapons

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PREFACE

This document reports the work performed by the Institute for Defense Analyses for the Defense Threat Reduction Agency, Advanced Systems and Concepts Office, in partial fulfillment of the tasks entitled “Beyond the Moscow Treaty: Alternative Perspectives on the Future Roles and Utility of Nuclear Weapons” and “Alternative Nuclear Futures – Phase 2.”

The authors wish to thank Andrew Coe for his contributions to the structuring and analysis of the two international security environments entitled “Back to the New World Order” and “Fallen Nuclear Dominoes.” David Hockaday was also most helpful in assembling the information required to project our baseline nuclear postures, and in determining what kinds of conventional munitions are available for strategic strikes. The authors are also particularly indebted to Dr. Elaine Bunn and Admiral Richard Meis, USN (ret.) for the excellent comments they made during the workshop held in July 2006 to review early versions of this work. Finally, we want to thank Dr. Alan Shaw for his painstaking review of this document and many helpful comments.

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SUMMARY

What requirements will guide the planning of U.S. nuclear forces in the decade ahead? The Nuclear Posture Review (NPR) of 2001 promulgated the Bush administration's guidance on future nuclear requirements, with an emphasis on adapting the U.S. nuclear posture to the requirements of 21st century security. And the administration's agreement in 2002 to the Strategic Offensive Reductions Treaty (SORT, or the Moscow Treaty) bound the United States to a force structure of a certain size, with some important implications for the functions of the force in deterrence, dissuasion, and assurance.

In 2009, a new administration will arrive. It will conduct its own NPR, building on the foundations of the congressionally mandated Strategic Posture Commission report due that spring. And it will review and assess the inherited strategic framework with an eye toward advancing its own interpretation of the national interest in the years ahead. The nuclear policy and strategy choices of the next administration, like those of the current one, will be driven by many factors. What policy, strategy, and capabilities will be needed in the decade from 2013 to 2022? A primary consideration will be the requirements as defined by the military community. What are those requirements? How might they evolve?

A key premise of this study is that military requirements deliberations have not advanced much beyond the framework of strategy and doctrine set in place by the 2001 NPR and 2002 Moscow Treaty. To help fill this gap, the Advanced Systems and Concepts Office (ASCO) of the Defense Threat Reduction Agency has a large portfolio of work underway. This portfolio is aimed at defining the opportunities and challenges for defense threat reduction as it relates to weapons of mass destruction (WMD). As part of this portfolio, the ASCO has commissioned a series of projects at IDA to address questions related to the future nuclear security environment.

This study looks "beyond the Moscow Treaty" to examine possible future U.S. nuclear requirements. IDA and the ASCO agreed to the following analytical approach:

1. Posit implementation of the Moscow Treaty as agreed. Although other factors may intervene to shift the timeline of implementation or the scope of arms control restraint, the debate over those possibilities should not distract from an

exploration of what requirements might guide U.S. planning after the force reductions in the Moscow Treaty are implemented.

2. Define a baseline U.S. nuclear posture on the assumption that there is no fundamental change in the U.S. security environment by 2022.
3. Explore how changes in the security environment might influence thinking about alternative nuclear requirements in 2022. Bear in mind that the purpose is not to predict a specific future or even to prioritize among alternatives. It is, instead, to define a reasonably plausible set of spanning possibilities and to begin to explore their implications for the U.S. nuclear posture. Ground the analysis in a discussion of real countries, but only as a means to calibrate the size and scale of potential problems. Doing so does not suggest or imply a conclusion that any of the countries discussed will necessarily be seen by the United States as an enemy a decade hence.
4. Characterize reasonable deviations from the baseline associated with each of the alternative security environments.
5. Be explicit about assumptions so that their potential significance can be evaluated by readers of the report.
6. Do not offer policy recommendations. This study is an exercise in defining the potential problem space.
7. Use only unclassified information in preparation of the report so that it can be widely discussed, with the hope that the discussion will inform development of a broader consensus on future nuclear requirements and the challenges of hedging against alternative futures.

THE 2022 BASELINE U.S. NUCLEAR POSTURE

The following assumptions guided the development of the baseline posture for 2022:

- There will be no change in the security environment that would generate significantly different requirements from contemporary circumstances.
- Capabilities-based planning will continue to guide the development of nuclear requirements. Accordingly, nuclear requirements will be derived from the requirements of immediate contingencies involving well-recognized current dangers, potential contingencies that are plausible but not immediate dangers, and unexpected contingencies that arise suddenly and pose unanticipated security challenges.
- National leaders will continue to require that the U.S. nuclear posture be capable of supporting OPLAN 8044 or some similar construct elaborating a large, integrated, and evolving family of contingency plans for nuclear use, built on a foundation of adaptive planning.

- The Joint Operating Concept (JOC) on Global Deterrence serves as a useful guide to thinking about the kinds of targets that the military would be asked to put at risk by nuclear means in a mounting crisis. That document indicates that “nuclear weapons threaten destruction of an adversary’s most highly valued assets, including adversary WMD capabilities, critical industries, key resources, and means of political organization and control (including the adversary leadership itself).”
- In the decade between 2013 and 2022, the United States is likely to make progress in strengthening its strategic military toolkit with the addition of more operationally effective missile defenses and non-nuclear strike systems. But this progress within this timeframe is unlikely to eliminate the requirement to retain nuclear capabilities to execute the missions elaborated in the JOC.
- Assurance and dissuasion will continue to be important U.S. objectives and must be accounted for in determining the characteristics of the U.S. nuclear force.

Given these assumptions, our analysis posits a baseline force of 3,445 U.S. strategic nuclear weapons in 2022. The operationally deployed force of warheads would be composed of 1,430 weapons, with 450 on intercontinental ballistic missiles (ICBMs) and 980 on submarine-launched ballistic missiles (SLBMs). The baseline force would also include non-operationally deployed forces totaling approximately 1,215 weapons, the great majority of which would be held for meeting unexpected contingencies, such as the failure of a class of weapons or the reemergence of Russia as an adversary. The remaining 800 weapons would be bombs (or perhaps a mix of bombs and nuclear-armed air delivered missiles) with 700 held in reserve for contingencies and 100 ready weapons supporting extended nuclear guarantees to allies.

This baseline force reflects relatively conservative estimates about the types of operations and targeting strategies that might be required to support U.S. objectives. It also reflects relatively conservative assumptions about the political environment, because it assumes no substantial positive change in U.S.-Russian relations. This raises an important question: Should the baseline posit more substantial continued reductions because the failure to do so would represent a departure from the current trajectory? Accordingly, the study offers a second, alternative baseline posture for 2022 posture: following implementation of the Moscow Treaty, the U.S. decides that a smaller stockpile would not be excessively risky and would serve U.S. interests. For this alternative baseline, targeting requirements vis-à-vis major powers and WMD challengers are reduced, as are the requirements for assurance in the forms of support for nuclear programs of cooperation for

allies. The force structure would then comprise 2,265 total nuclear weapons as opposed to 3,445 in the original baseline, with only 965 operationally deployed warheads.

In either case—the original baseline or the alternative—the U.S. nuclear force continues to exist as a triad, with nuclear bombs (or missiles) delivered by dual capable aircraft, an important element of the deterrent. In either baseline, other elements of the “new triad” (i.e., defenses and non-nuclear strike) have not eliminated current core nuclear missions. Our analysis explores whether the baseline postures can be supported with the existing nuclear infrastructure.

ALTERNATIVE INTERNATIONAL SECURITY ENVIRONMENTS 2013–2022

Within the U.S. government and the broader analytical community, myriad approaches have been employed to investigate possible evolutions in the U.S. security environment. There are numerous, divergent views about the factors that will shape the future, encompassing many economic, demographical, environmental, technological, ideological, economic, and political factors. Moreover, even as analysts define and project trends, many remain wedded to the notion that uncertainty makes the future unpredictable.

This study settled on three main challenges in the U.S. security environment. One challenge, inherent in major power relations, is to seize the opportunity (as the *2002 National Security Strategy* puts it) to move away from historic patterns of confrontation and toward deepening strategic cooperation based on common interests and common responsibilities. The second challenge, at the regional level, is to consolidate regional stability where it exists and safeguard it from challengers of various kinds. The third challenge, at the non-state level, is to confront violent Islamic extremists and their pursuit of a revolutionary agenda against their “near enemies” while bringing war against their “far enemies.” Looking ahead a decade, it is possible to imagine progress or failure on each of those fronts. Whether we make progress in dealing with these challenges or lose ground will fundamentally shape the U.S. security environment of 2022.

In the major power dimension, it is possible to imagine a best case (deep concert) and a worst case (adversarial tripolarity) and some less extreme outcomes, one inclining toward best case (deepening cooperation) and one inclining in the opposite direction (loose U.S.-PRC bipolarity). In the regional dimension, it is also possible to imagine a best case (WMD rollback and full democratization) and a worst case (WMD multipolarity) and some less extreme outcomes, one inclining toward best case (fewer weak states) and one in the opposite direction (new challengers emerge). In the so-called long war, it is again possible to

imagine a best case (extremists vanquished), a worst case (the emergence of a nuclear-armed and expansive caliphate), and the less extreme outcomes, one inclining toward best case (extremism contained) and one inclining in the opposite direction (al Qaeda gains control of a state but not WMD).

How might these outcomes combine to constitute threat environments for the United States? Of course many combinations are possible, but the following struck us as both plausible and adequate to map the full problem space (from the perspective of defining potential future nuclear requirements). These run roughly from most benign to most potentially stressing.

1. *Back to the “new world order”*: This is the combination of all of the best cases described above. This is NOT “peace breaks out everywhere,” because challengers would remain—and because such a world would seem very threatening to the remaining illiberal states.
2. *Making headway in building order*: This is the combination of all of the cases inclining toward best case: the major powers are cooperating more but still not reliably, there are fewer weak states but some remain, extremism is contained but not vanquished.
3. *Losing ground*: This is the combination of all of the cases inclining toward worst case: the U.S. and China are becoming more strategically competitive, a few new regional challengers have emerged, and al Qaeda has gained control of a non-WMD state. This would be a fearful world, but hope would remain of turning the situation around.
4. *Adversarial U.S.-PRC bipolarity*: This is a future in which peer adversarial relations erupt between China and the United States, but other developments in the global security environment are quite positive (al Qaeda is vanquished and the subregions have settled into relative stability).
5. *Adversarial U.S.-Russia-China tripolarity*: In this world, the regional and extremist challenges have dissipated and been replaced by a complex, tripolar, adversarial, peer competition.
6. *Fallen nuclear dominos*: This would be a world marked by WMD multipolarity, with the major powers coping with major new instabilities in the subregions. But this would not be the nuclear jungle, because few of the proliferators seem likely to attempt aggression backed with their nuclear forces and more dominoes could yet fall (not many can fall in the one decade that is the timeframe of this study).
7. *Expansive nuclear caliphate*: This world would be marked by the emergence of a caliphate committed to undoing the state system in the ‘Umma’ and ultimately expanding the writ of Islam globally—and willing and able to use nuclear

weapons in service of these causes. In such a world, the other regional actors and the major powers would likely find a high measure of concert necessary.

The supporting analysis explored the factors that would inform the planning of the U.S. strategic posture for each of these worlds. We catalogued the types of military problems the United States would confront, the responses it would want to muster, and the needed military capabilities, both conventional and strategic. We also explored possible alternative nuclear and non-nuclear means for accomplishing U.S. purposes.

This work led us to a number of conclusions, among them:

- The balance among the different elements of the strategic toolkit (various forms of strike and defense, etc.) varies significantly across the spectrum of alternative futures.
- The balance of emphasis among assurance, dissuasion, deterrence, and defeat also varies significantly.
- Nuclear deemphasis may continue and even accelerate. But some pathways point to a tapering off of de-emphasis and indeed a renewal of nuclear competition.
- Threat reduction will likely remain a U.S. objective in any of the plausible futures, but its scope and content would be shaped significantly by the existing security environment and by the perceived trajectory of further developments.
- Some alternatives in the 2013–2022 timeframe would seem relatively transitional, whereas others would seem more durable.
- A security environment becoming more orderly would produce a more intense focus on how best to lead by further reducing U.S. reliance on nuclear weapons and by taking on new restraint obligations.
- A security environment becoming less orderly would invoke more intense focus on how best to hedge.
- A less orderly security environment would also stimulate questions about how to create new capabilities tailored for the requirements of an era of instability quite unlike the Cold War.

U.S. NUCLEAR POSTURES FOR THE ALTERNATIVE INTERNATIONAL SECURITY ENVIRONMENTS

Back to the “new world order”: Reflecting the positive state of relations among the major powers, the United States would likely seek (and gain) agreement with Russia for deeper

force reductions, along with agreement by China not to seek a parity-based force of its own. It would likely also want to hedge against a renewal of near-peer competition by retaining a substantial force of non-operationally deployed weapons. Reflecting continuing concerns about rogue challengers, however, the U.S. would retain operational capabilities for theater nuclear power projection. Programs of cooperation with allies would likely remain important in this future.

Making headway in building order: The requirements associated with this alternative could align closely with the parameters of the alternative baseline force noted above. Because problems remain in all three dimensions, significant capabilities would likely be seen as necessary. But the desire to consolidate gains and create momentum for further progress would likely reinforce efforts to reduce stockpiles and accelerate nuclear deemphasis.

Losing ground: The requirements associated with this alternative could align closely with the baseline nuclear posture if the U.S. saw this alternative calling for a slowing of nuclear reductions. Or the alternative baseline might be seen as appropriate if continued reductions at the rate accomplished with the Moscow Treaty were judged as promising the better chance for turning the security environment around—and if the chosen posture preserved enough of a hedge against the possibility that the situation became even worse. We suggest that something like the baseline posture is the more likely choice.

Adversarial U.S.-PRC bipolarity: In this alternative future, the value to U.S. leaders of a posture tailored to the requirements of deterring China and assuring Japan would rise. They would seek improved capabilities to target People’s Liberation Army (PLA) strike systems and more robust programs of cooperation with allies (not just Japan). As a hedge, they might also seek an increase in the number of non-operationally deployed warheads.

Adversarial U.S.-Russia-China tripolarity: The key factor here would be efforts by Russia and China to make robust improvements to their strategic postures, and U.S. efforts to suppress their new capabilities to the extent practical. Reductions in deployed forces would likely halt and indeed be reversed, as non-operationally deployed forces are returned to the field. U.S. leaders would likely also seek to enhance programs of nuclear cooperation with U.S. allies.

Fallen nuclear dominoes: It seems unlikely that nearly all of the states that proliferate, or prepare to do so, are going to be, or become, adversaries of the U.S. But the United States would want to have a deterrent posture deemed effective against “rogue” challengers. Given the relatively small target set (following the framework of the analysis done for the expansive

nuclear caliphate) in such countries, the incremental addition to the U.S. force structure would be small, at least within the decade following the end of the Moscow Treaty.

Expansive nuclear caliphate: This is the most novel challenge for U.S. nuclear planners that could emerge in the decade ahead. The “rogue states” of the last two decades have not pursued broadly global revolutionary goals; rather, their objections to the status quo have been, to a great degree, locally focused. The emergence of a caliphate could renew American concerns about revolutionary nuclear powers akin to the concerns that crystallized with the advent of Soviet and Chinese nuclear weapons. The revolutionary aspirations of al Qaeda not just to restore the caliphate, but to secure its writ over the entire Muslim world (and perhaps also to follow this with a global campaign against non-Muslims), holds out a set of distinct and dire challenges, especially in a world where such ambitions might be backed with nuclear weapons. Such a revolutionary power could compete with the United States for nuclear advantage, reaching new thresholds as it deploys:

- Its first operational weapon, which would signal its emergence as a nuclear power.
- A minimum defensive capability, defined as the capability to expect one of its weapons to survive to a high-value target, taking the U.S. “new triad” into account. This might cause the leaders of a new caliphate to conclude that the United States won’t put them into a position of “nothing left to lose.”
- A minimum offensive capability, defined as the above plus enough in reserve to expect only limited retaliation from the United States. This is the minimum necessary for the caliphate to believe that it could win a limited nuclear war for limited stakes.
- An existential threat, defined as the above plus enough to pose an existential threat to the United States. With this capability, leaders of the caliphate could have substantial confidence that the United States would do its best to avoid war for limited interests.
- Parity in numbers: by which the caliphate would come to be seen as a nuclear peer.

If the United States deemed the emergence of such a revolutionary force to be imminent, it would likely take military action to prevent it. The more extensive examination of this scenario included at the end of this volume explores the military requirements of such an effort and underscores the high utility of a robust “new triad” in accomplishing that end. But the focus here is on the consequences of a failure to act at such a moment (or a failure to do so successfully), and the implications of living with a new revolutionary power. For

that world, the United States would likely desire very robust non-nuclear strategic strike capabilities and missile defenses for itself and its allies. It would also likely want to meet new requirements for assurance of friends and allies with nuclear programs of cooperation. But some core nuclear missions would remain, and the value of weapons promising additional effectiveness and minimum unwanted damage would be high.

The study also postulated alternative nuclear force structures associated with each of the alternative international security environments. It did so by drawing on the characterizations of needed U.S. nuclear postures and strategies, utilizing the planning assumptions listed above, and considering the analysis employed to build the baseline scenarios. Of course, the derivation of precise and specific requirements for nuclear weapons is ultimately a political matter. And estimating the size and nature of future U.S. nuclear force postures is as much art as science, involving many factors that are open to judgment and debate. The work reported here is intended as a reasoned postulation of possible future U.S. nuclear requirements and how they might vary with changes in the future international security environment. The results are summarized in Table S-1.

Table S-1. 2022 Nuclear Postures for Alternative International Security Environments

	<u>Operationally Deployed Warheads</u>	ICBM	SLBM	<u>Non-Operationally Deployed Warheads</u>	<u>Bombs</u>	Contingencies	Programs of Cooperation	<u>Totals</u>
Back to “New World Order”	600	300	300	800	600	550	50	2000
Making Headway	965	300	665	700	600	500	100	2265
Losing Ground	1430	450	980	1215	800	700	100	3445
Adversarial US-PRC Bipolarity	1830	450	1380	1615	800	600	200	4245
Adversarial US-Russia-China Tripolarity	2530	930	1600	2640	1000	700	300	6170
Fallen Nuclear Dominos	1630	450	1180	1415	800	500	300	3845
Expansive Nuclear Caliphate	1530	450	1080	1315	800	600	200	3645

Some simple observations follow easily from the numbers in the chart. There is significant variation in size from the smallest to the largest of these nuclear postures—numbers of operationally deployed nuclear weapons increase by more than a factor of four, and total numbers of nuclear weapons increase by just over a factor of three. And of course, it is not surprising that the smallest of the postulated postures corresponds to the most benign future and the largest correspond to the futures associated with peer adversarial competition. A tripolar competition produces larger requirements than those necessary for the bipolar competition. The emergence of a small number of new nuclear-armed “rogues” or of an expansive nuclear caliphate do not significantly increase the size of the force. This reflects the assumption that in the timeframe of the study such states will not be able to realize significant increases in the size of their nuclear forces.

Finally, the future demands of extended nuclear deterrence can be a significant factor in determining the size of the force of nuclear bombs (or mix of nuclear bombs and air-delivered nuclear missiles). In certain alternative futures, those demands could be substantial, for example, in the worlds of “fallen nuclear dominoes” or “adversarial tripolarity.” This also reflects the assumption that the United States would continue in such worlds to offer nuclear-backed security guarantees to its allies and would operationalize that commitment using nuclear weapons.

ON HEDGING

This analysis was not designed principally to explore questions associated with how to hedge today so that the United States is prepared for these alternative nuclear requirements. But it does vividly demonstrate some of the challenges of doing so.

For example, the largest of the projected 2022 nuclear postures requires, among other changes, employing all of the upload capability of the current SLBM force. If the United States relinquishes such upload capability as it pursues further nuclear reductions with Moscow and/or modernizes delivery systems, it will lose the ability to respond rapidly to some of the less benign futures as they emerge.

As another example, in the more stressing international security environments, the United States (and its allies) would likely place new value on nuclear forces that are modern and deployable with a high degree of confidence in their effectiveness, security, and safety. Moreover, some new types with improved operational capabilities, such as reduced yield, could be quite valuable. And the numbers of needed new weapons could in some futures be considerable. Yet the ability to generate such capabilities will depend on the existence of a weapons complex and associated infrastructure capable of generating the needed weapons on a timely basis. The transformation of the complex for the purpose of stockpile modernization and enhanced agility has not been well advanced with the focus over the last decade having been on stockpile stewardship.

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INTRODUCTION

The Nuclear Posture Review (NPR) of 2001 promulgated the Bush administration’s guidance on future nuclear requirements, with an emphasis on adapting the U.S. nuclear posture to the requirements of 21st century security. And the administration’s agreement in 2002 to the Strategic Offensive Reductions Treaty (SORT, or the Moscow Treaty) bound the United States to a force structure of a certain size, with some important implications for the functions of the force in deterrence, dissuasion, and assurance.

This study looks “beyond the Moscow Treaty” to examine possible future U.S. nuclear requirements. The analysis is presented in 9 briefings that were presented to various audiences and subsequently revised to add new material in response to comments made by our audiences, and to enable them to be read and adequately understood on their own.

The first of these briefs, entitled *Alternative Security Environments and Alternative U.S. Nuclear Postures 2013–2022*, provides a short project overview and describes in some detail how the seven alternative 2013–2022 international security environments were developed. The brief ends with a short discussion of the changing content of “threat reduction” suggested by our alternative international security environments.

The second brief, entitled *Projections of 2022 U.S. Nuclear Postures for Alternative International Security Environments*, develops two modernized 2022 baseline U.S. nuclear postures, assuming that the international security environment in 2022 is not substantially different from that of today. These postures do assume that China, in line with its apparent ambitions, modernizes and expands its strategic missile forces and that the DPRK and Iran field a small number of intercontinental ballistic missiles. The assumed modernization for the U.S. stockpile is most unlikely to be completed by that time, but the work is aimed at illustrating potential needs even if they are not realized until after 2022. The brief then examines each of the alternative international security environments and projects changes to the baseline posture that would seem appropriate to its needs and opportunities.

The third through the eighth briefs develop the first 6 of the alternative 2013–2022 international security environments. Each brief poses and then answers each of 14 key questions listed below:

1. What are the basic characteristics of this particular security environment?
2. What is the primary strategic challenge to the U.S.?
3. What particular military problems might the U.S. confront?
4. What strategic response would the U.S. want to muster?
5. What general military posture would best support U.S. objectives?
6. What would the U.S. seek from each of the elements of the New Triad?
7. For strategic strike, what broad objectives would guide U.S. planning?
8. What would be the targeting problem?
9. What would the U.S. seek from the different elements of strategic strike?
10. For the nuclear force, what characteristics would be desirable?
11. What nuclear force posture would be suitable?
12. What strategy and policy context would best serve U.S. interests?
13. What would threat reduction encompass in this environment?
14. Would this environment seem more certain?

The ninth and final brief, entitled “New Triad Capabilities vs. Expansive Nuclear Caliphate,” presents a more in-depth analysis of what the strategic military requirements of this alternative international security environment might be. That analysis was needed to inform our projections of the kinds of strategic capabilities that the United States might need in the future to dissuade, deter, and—if necessary—defeat rogue states with nuclear weapons and to assure allies that they would not need independent nuclear forces. This brief identifies both nuclear and conventional strike capabilities that would be useful and that, to our knowledge, the U.S. does not already have.

I. ALTERNATIVE SECURITY ENVIRONMENTS AND ALTERNATIVE U.S. NUCLEAR POSTURES 2013–2022

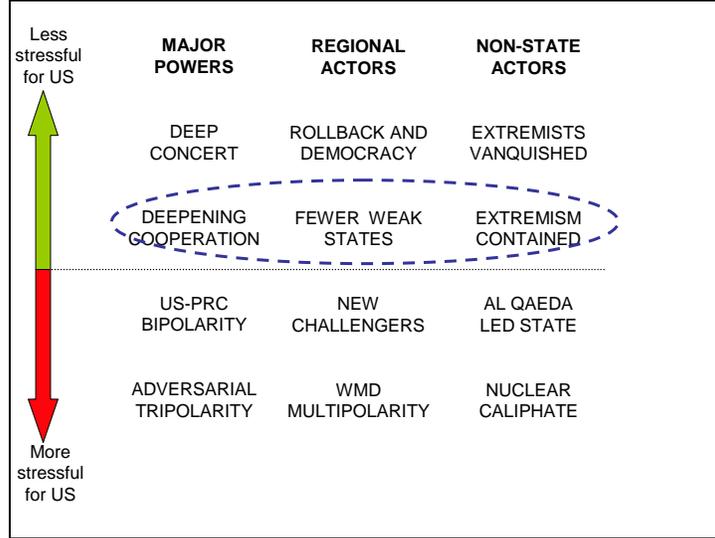


BMT Project Subtask on Thinking Through Alternative Security Environments Making Headway in Building Order

Brad Roberts
July 26, 2006

Key Questions

1. What are the basic characteristics of this particular security environment?
2. What is the primary strategic challenge to the US?
3. What particular military problems might the US confront?
4. What strategic response would the US want to muster?
5. What general military posture would best support US objectives?
6. What would the US seek from each of the elements of the New Triad?
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13. What would threat reduction encompass in this environment?
14. Would this environment seem more certain?



What Are the Basic Characteristics?

Major powers:

- Not returning to more competitive ways.
- Economic and political engagement slowly but steadily deepening.
- But still limited security cooperation and still strong doubts about the longer term.

Regions:

- Progress but not full success at rollback and regime change.
- No new rogues or proliferators emerge.
- Regions generally stable but some important weak states.
- US alliance relations are a mix of status quo and growing even stronger. More states seek US protection and security assistance than go self-help route.

Violent extremism:

- Reduced but not yet eliminated. US and allies well protected and violence is focused on "apostate regimes."

General: globalization and democratization proceeding without significant new ideological backlash.

What is the Primary Strategic Challenge to US?

Consolidating successes and reinforcing trends.
Coping with the instabilities posed by weak states and the occasional aggressive regime.

What Particular Military Problems Might the US Confront?

1. Collapsing WMD-armed states.
2. Aggressive WMD-armed rogues.
3. Rising powers that might at some future time choose peer adversarial competition.

What Strategic Response Would the US Want to Muster?

1. US would want to project power into weak and collapsing states for stabilization and reconstruction missions.
2. US would want to contain and deter WMD-armed rogues and also be prepared to defeat at low risk should that prove necessary.
3. US would want to cope effectively with the "loose nukes" problems generated by weak or collapsing WMD-armed states.
4. US would also want to extend deterrence to allies and partners in unstable regions/zones.
5. US would want to dissuade rising powers from choosing to compete with the US.

What General Military Posture Would Best Support US Objectives?

High value attributes:

- Conventional power projection to unstable regions.
- Capable against improving but not highly sophisticated asymmetric counters to US power.
- Well hedged against possible future major power challengers.

What Would the US Seek From Each Element of the New Triad?

Infrastructure:

- Tailored for flexibility as hedge against future major power competition.

Defenses:

- Generally less important than perceived today.
- MD tailored to a small number of modestly armed regional powers.
- MD capable of out-racing a major power in a defense-offense sprint.
- Passive defenses against CBW scaled to regional actors.

ISR:

- An "unblinking eye" over remaining rogues.

Strike:

- Capable of achieving desired strategic effects by non-nuclear means against any regional adversary—in combination with missile defenses.
- Nuclear weapons held for retaliation and war termination in extremis.

For Strategic Strike, What Objectives?

To fight wars by playing to US strengths (conventional rather than nuclear).

To win wars on US terms (low collateral damage, decisive effects).

To restrain the efforts of WMD-armed rogues to coerce their neighbors or the US with nuclear threats through a credible threat of preemption.

What Would be the Targeting Problem?

For defeat: the cumulative target set of a handful of weak but WMD-armed states.

- Leadership targets: few in number.
- WMD targets: scores but generally vulnerable (but difficult to kill promptly by non-nuclear means).
- HDBT: numerous and growing, including going deeper.
- Other military targets appropriate for strategic strike: not numerous.

For dissuasion: the nuclear capabilities of potential future major power adversaries. Overarching objective: continued vulnerability of their political, military, and strategic targets to overwhelming US retaliation.

What Would the US Seek from the Different Elements of Strategic Strike?

Kinetic:

- Nuclear vs. non-nuclear:
 - US leaders would have strong preference for non-nuclear means (non-nuclear strike in combination with BMD) to achieve all strategic effects.
 - Nuclear weapons would be held for purposes of retaliation against WMD-willing rogues and for war termination in extremis.

Non-kinetic:

- Cyber might offer particular promise against rogue state militaries that rely on outdated equipment or recent off-the-shelf purchases.
- SOF could operate with significant latitude in weak states and in rogue states with significant internal public opposition.

For the Nuclear Force, What Characteristics Would Be Desirable?

Capable of operating effectively at levels of escalation opened up by adversaries choosing to escalate.

Usable in small numbers for tailored effects in some conceivable circumstances.

- US would want to be sure that they will go where they're supposed to go and do what they're supposed to do and communicate with the user until they're done.

For the Nuclear Force, What Force Posture Would Be Suitable?

Alert posture:

- Generally low—or at least matching whatever posture is operative in Russia and China.
- Primary mission: delivering relatively small numbers of weapons in a war that takes shape as a result of mounting crisis.
- That small number rapidly alertable or highly survivable if not actually "alert."

Baseline posture:

- With significant capability to increase the operationally deployed force against potential reemergence of a peer adversarial threat.

What Strategy and Policy Context Would Best Serve US Interests?

In the a-d-d-d construct, emphasis would be on dissuasion:

- Of next rising powers.
- Of RF and PRC recidivism.
- Of next rogues.

Assurance of friends, allies, rising powers, and other WMD-capable states that they need not aggressively hedge against a future sudden deterioration in the security environment would also be a priority.

On deterrence:

- US would want to persuade rogue leaders of its will and ability to use nuclear weapons in numbers small and large in the circumstances they might create.
- But US would also want to keep nuclear threshold high so as not to legitimize rogue use of nuclear weapons.
- Extended deterrence remains a central US preoccupation in this scenario. But it would not worry policymakers as much in this environment as in those involving major uncertainties about the major powers.

What Would Threat Reduction Encompass?

Vis-à-vis major powers:

- Wartime: Not deemed a central problem.
- Peacetime: "Arms race stability" would not be a significant preoccupation. Focus on rolling back capabilities and lending predictability to trends.

Vis-à-vis regions:

- Nonproliferation would be seen as gaining strength in this environment.
- US would want to utilize these norms to constrain rogue state behavior—and to justify punitive measures.

Would This Environment Seem More Certain?

Not very.

- Some would feel confidence from trend lines and emphasize the "wins" that had helped catalyze them, leading them to argue that to shape the future the US must be more restrained in its exercise of power.
- Others would be more wary of trend lines and emphasize the likelihood of further "losses" and "draws," leading them to argue that to shape the future the US must be more pro-active in developing and using its power.

There would be some continued hedging by some major and medium powers, but there would also be rising interest in how to stabilize hedging competitions in order that they not become self-fulfilling.

US would likely give significant emphasis to cultivating with the other major powers common perceptions of the challenges in the security environment—and the common interests in meeting them.

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*Projections of 2022 US Nuclear Postures
for Alternative International Security
Environments*

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Purpose and General Approach

1. Presumably, then as now, the US nuclear posture must be capable of supporting US OPLAN 8044. This operations plan includes a large integrated and evolving family of contingency plans for use of nuclear weapons. These plans are applicable to a wider range of contingencies than those that were included in the SIOP during the Cold War. The posture must also be capable of supporting adaptive nuclear plans that may have to be developed quickly for unanticipated scenarios. And, all plans should be tailored to reflect the best possible understandings of what kinds of US nuclear threats or actual attacks, would be most effective in deterring any given adversary from initiating or escalating warfare potentially employing WMD.
2. US strategy for targeting nuclear weapons is now based on capabilities-based targeting rather than threat-based targeting. Thus, the US now identifies potential future conflicts, reviews the capabilities of its possible adversaries, identifies those adversary capabilities the US might need to attack or threaten with nuclear weapons, and develops and maintains a force posture and nuclear weapons employment strategy that would allow it to attack those capabilities.
3. The purpose of this analysis is to provide illustrative projections of the US nuclear force postures that might logically be needed by 2022 – the end of the decade following the end of the Moscow Treaty – for each of the international security environments (ISEs) defined above.

Purpose and General Approach

4. The Defense Department has further indicated that these plans must address three types of contingencies: *Immediate contingencies* that include well-recognized, current dangers, *potential contingencies* that are plausible but not immediate dangers, and *unexpected contingencies* that arise suddenly and pose unanticipated security challenges.
5. A possible list of target types is included in "Deterrence Operations: Joint Operating Concepts." That document indicates that "nuclear weapons threaten destruction of an adversary's most highly valued assets, including adversary WMD capabilities, critical industries, key resources, and means of political organization and control (including the adversary leadership itself).
6. The projections developed here are intended to provide a general idea of the size and composition of the nuclear postures the US might need for each of the projected ISEs. These projected postures are constructed to provide enough nuclear forces with a wide enough range of capabilities to allow the US to meet any combination of nuclear capability requirements that might plausibly arise within each 2022 ISE.
7. They are constructed by using unclassified sources* to identify a reasonable set of most highly valued assets for the more commonly identified potential US adversaries. The analysis then builds up an estimate of the numbers and general types of nuclear weapons that would be sufficient to put these assets at risk.

*Our sources were The Military Balance 2008 (and prior years), International Institute for Strategic Studies; Jane's Strategic Weapons Systems, Issue 46 (and prior issues), Jane's Information Group Limited; and numerous internet sources on the military and civil infrastructure of specific states.

Purpose and General Approach

8. Most, if not all actual US war plans seem likely to involve targeting only a small fraction of the targets identified in this analysis. It would also not be surprising if some US war plans involve targeting some assets that are of types different from those considered below.
9. In sum then, the aim of this analysis is provide a *judgment of the size and nature of nuclear postures that would be sufficient to meet the maximum plausible US requirements for nuclear forces by the end of the decade following the expiration of the Moscow Treaty.*
10. Obviously, numerous individual judgments must be made in developing such projections. Some readers will surely differ with the author's judgments. The analysis provided should be sufficiently transparent to allow the reader to make different judgments and assess their effects.

Two Part Construction of Projections

1. Part one develops an "analytical baseline posture" that assumes for purposes of analysis that the international security environment in 2022 is much the same as it is today. Nonetheless, the one trend that is evident today is that the US nuclear posture is being reduced to meet the requirements of the Moscow Treaty, and further reductions beyond the end of the treaty on December 31, 2012 can be expected. Thus, two variants of the analytical baseline posture are developed – one that has modest reductions by 2022, and one that has somewhat more aggressive reductions.
2. Part two interprets how the features of each of the ISEs might logically translate into adjustments to the analytical baseline postures to fit them for each of the ISEs.

Constructing Alternative 2022 Nuclear Postures - Part 1

Project an *analytical baseline* US nuclear posture that:

1. Does not exceed the constraints of the Moscow Treaty (1700-2200 operationally deployed nuclear weapons as of December 31, 2012.)
2. Assumes *for purposes of analysis* a nuclear security environment not significantly different from that the US faces today, but deploys improved nuclear weapons of types that could begin to become available by 2022.
3. Provides nuclear forces capable of destroying the high value targets of potential adversaries in numbers and types sufficient to guarantee such adversaries could not rationally judge they would profit from attacks with WMD – especially nuclear weapons – against the US and its allies.
4. Provides nuclear forces sufficient to target potential adversaries capabilities to employ weapons of mass destruction against the US and its allies, assuming they can be located and identified with sufficient accuracy.
5. Makes reasonable assumptions for planning factors that affect the overall size of the US nuclear posture, such as required force readiness, allowances for weapons in rotation pools, in transit, and for overhaul, tear-down and component testing, hedging against failures of nuclear weapons types, etc.
6. Includes nuclear weapons for supporting extended nuclear deterrence arrangements under which US nuclear weapons could be provided to allies for agreed nuclear missions

Key Assumptions and Judgments

1. While the numbers of nuclear weapons in the alternative nuclear postures developed below may strike some readers as high, the author believes they are reasonably conservative. Thus, for example, the calculated weapons requirements assume that none of the types of targets considered are so important to destroy quickly as to justify initially launching more than one weapon against each. Similarly, only a modest fraction of some types of targets are assumed to be attacked. For example, only 20% of the brigade equivalent targets are struck, and then only with a single weapon each. This would allow the headquarters units of the more elite brigades to be attacked. Further, no industrial targets are included though such targets might be the logical choices if retaliation against civil targets is required.
2. Most hard and deeply buried targets can be struck effectively with earth penetrating weapons. If the target is well located, the weapon has been designed appropriately, and it is accurately placed, the collateral damage that might be caused would be much lower than that generally associated with ground burst nuclear attacks considered in the past. Nonetheless, depending upon location, attacks on HDBTs could still cause substantial collateral damage. Further, some states appear to have very large numbers of such facilities. Thus, the analysis assumes that only small numbers of the most important HDBTs would be attacked with nuclear weapons.

Key Assumptions and Judgments

3. On the other hand, nuclear weapons allocated for missions by allies under nuclear programs of cooperation are not counted here as guaranteeing the destruction of the targets considered in this analysis. These weapons are provided primarily to assure participating allies that they can count on US extended nuclear deterrence and to enable them to share the responsibilities for use of nuclear weapons. At the same time, the US should not count on the allies to participate. In any case, all the nuclear postures projected here provide relatively small numbers of nuclear weapons to each participating ally.
4. Every nuclear weapon considered operationally deployed in this analysis is assumed to be backed up by another non-operationally deployed weapon of a substantially different type. This is done in order to hedge against the possibility of timely discovery of the complete failure of any single type of weapon. If this hedge is to be really effective, the hedge weapons must be of sufficiently different design from those they would replace as to make simultaneous failure of both classes very unlikely. The analysis further assumes that nuclear weapons designed for any of the three legs of the nuclear triad cannot be used by the other legs. If this constraint can be reduced or eliminated in new designs, the numbers of non-operationally deployed weapons required if the need were solely to hedge against technical failures of weapons can be greatly reduced.

Key Assumptions and Judgments

5. The projections of nuclear postures developed in this analysis assume new nuclear weapons and new infrastructure to produce them. Given that the latter must precede the former, this transformation cannot possibly be complete by 2022. At most, the transformation of the US nuclear stockpile will have only started. Varying this analysis to accommodate alternative assumptions about the nature and timing of the transformation would have complicated it greatly and added a great deal more speculation to this already very speculative analysis.
6. US extended nuclear guarantees to allies have included and still include programs of cooperation under which nuclear weapons are stored under US control on their territory for potential use by those allies in carrying out nuclear missions in wartime. Other ways of providing such guarantees are obviously possible and new types of arrangements may be made in the future. In this analysis, we assume that nuclear bombs for possible allied use are maintained at a high level of readiness for deployment, and some are normally deployed.

Summary of Specific Steps for Constructing the Analytical Baseline Nuclear Posture

1. Specify states and sub-state organizations to be viewed as potential adversaries, or that might quickly become adversaries, and that thus can serve as a basis for determining the size and general characteristics of the US nuclear deterrent.
2. Specify types and numbers of high-value targets in these states that might have to be held at risk to enable deterrence and the suppression of WMD capabilities.
3. Specify types and numbers of nuclear weapons that might reasonably be planned for the destruction of these targets.
4. Specify how these numbers should be increased to guard against potential US nuclear weapons losses to adversaries' counterforce and defense capabilities.
5. Specify how the above numbers should be increased to compensate for estimated combined operational reliabilities of US ISR, delivery, and weapons systems.

*Summary of Steps for Constructing
the Analytical Baseline Nuclear Posture*

6. Combine the above calculations to obtain total types and numbers of nuclear weapons US needs to be able to launch at potential adversary targets to achieve deterrence and WMD suppression effects.
7. Specify the types and numbers of operationally deployed weapons required in order to provide the nuclear capabilities specified above.
8. Specify how the above types and numbers of weapons should be distributed across alternative types of delivery systems, assuming a prudent policy for ensuring that sufficient forces are immediately available. Add in requirement for additional SLBMs for maintenance and rotation among SSBNs.
9. Specify how above numbers should be increased to meet other "overhead" requirements such as weapons in transit, maintenance, reserved for tear-down and component testing, etc.
10. Specify how above types and numbers should be increased to hedge against the possibility of technical failures of US weapons types.

*Summary of Steps for Constructing
the Analytical Baseline Nuclear Posture*

11. Add in any additional weapons needed to support extended nuclear deterrence for allies.
12. Adjust resulting posture as necessary to support claim US strategic strike capabilities are second to none.
13. Adjust as necessary to provide suitable degrees of assurance and dissuasion.
14. Adjust as necessary to provide suitable strategic capabilities for strikes against special targets such as terrorist leadership, personnel and facilities, and WMD capabilities.
15. Reduce numbers to take into account assumed capabilities to produce new warheads on a timely basis.

Baseline Potential Adversaries (step 1)

- A. Potential Adversaries for which the US is assumed to maintain nuclear forces for deterrence and suppression of WMD:
- DPRK
 - Iran
 - Syria
 - China
- B. Potential Adversaries for which the US is assumed to hedge against the quick emergence of a need for nuclear forces for the above purposes:
- Russia

Numbers of Candidate High Value Targets (step 2)

Target Types	Russia	China	DPRK*	Iran*	Syria
ICBM sites (Fixed/Mobile)	200/60	24/80	10	10	-
Theater missile sites (F/M)	0/20	80/30	36/36	40/15	0/18
Strategic airbases	10	15	4	4	5
Strategic submarine bases	6	4	-	-	-
Nuclear storage	90	26	6	-	-
Nuclear R&D/production	20	10	8	8	-
CBW R&D/prod./storage	70	10	20	5	7
NCA/C3 sites	Many	Many	10s	-10	-10
Other airbases	20	20	8	6	10
Naval bases	15	12	8	15	3
Major Ground forces HQ	15	60	7	10	4
Brigade equivalent units	170	500	600	60	70
Military/secret cities	40	-	-	-	-
Space launch/ASAT sites	5	5	1	4	-
Surveillance radars/BMD	25	3	2	2	2
Major civil targets	50	300	5	6	3

*Whether and when the DPRK and Iran succeed in deploying ICBMs is uncertain. They could see the assumed number of nuclear ICBMs as constituting a "minimum defensive capability" in the face of evolving US BMD. See the ENC analysis, chart 8 for definitions of alternative threshold levels of nuclear forces.

*Nuclear Weapons Assumed Required For
Destruction of Each Target Type (step 3)*

1. ICBM and Theater missile sites: 1 fast, precision-guided, low-yield weapon (FPGL) per site
2. Strategic airbases: 1 fast, airburst, medium-yield weapon (FAM) per base
3. SSBN bases: 1 FAM weapon per base
4. Nuclear storage sites: 1 fast, precision-guided, low-yield, possibly earth penetrating weapon (FPGL/~EP) per site
5. Nuclear R&D and production: 1 PGL/~EP weapon per facility
6. CBW production and storage: 1 PGL/~ER possibly enhanced radiation weapon per facility
7. NCA/C3 sites: 10 FPGL/~EP weapons allowance each for Russia and China, and 5 for all others

*Nuclear Weapons Planned for
Delivery on Each Target (step 3)*

8. Other major airbases and naval bases: 1 AM weapon per site
9. Major ground forces HQ, space launch/ASAT sites, long-range surveillance radars: 1 PGL weapon per site
10. Brigade equivalent units: 1 PGL weapon per unit for 20% of total units
11. Military/secret cities: 10 AM weapon allowance for Russia, none for others
12. Major civil targets: 1 airburst, high-yield (AH) weapon per for top 50 targets in Russia, 1 per for top 100 targets in China, 1 per top target in all other potential adversary states. No nuclear strikes specifically against civil targets for purposes other than retaliation for adversary WMD use against US and allies' civil targets.

*Additions for Potential
Operational Losses (steps 4-5)*

1. The US will be assumed to follow a policy providing sufficient immediately available survivable weapons to support the targeting implied by steps 1-3 above.
2. 50 additional PGL weapons will be allowed for penetration or suppression of Russian missile defenses. For analytical convenience, these weapons will be treated as if they were targeting surveillance radars. No significant missile defenses are assumed for other potential adversaries.
3. An allowance of 20% additional weapons is included for follow-up strikes against WMD-related targets, NCA/C3 sites, and civil military targets that are judged to have a significant chance of not having been destroyed by the initial weapons targeted against them. No other compensation is provided for operational losses.

*Projected Deliverable Nuclear
Weapons Requirements (step 6)*

<i>Target and Weapon Type</i>	<i>Russia</i>	<i>China</i>	<i>DPRK</i>	<i>Iran</i>	<i>Syria</i>
ICBM sites (F/M) FPGL	312	125	12	12	-
Theater missile sites (F/M) FPGL	24	132	86	66	22
Strategic airbases FAM	12	18	5	5	6
Strategic submarine bases FAM	7	5	-	-	-
Nuclear storage FPGL/-EP	108	31	7	-	-
Nuclear R&D/prod PGL/-EP	24	12	10	10	-
CBW R&D/prod/store PGL/-ER	84	12	24	6	8
NCA C3 sites FPGL/-EP	12	12	6	6	6
Other airbases AM	20	20	8	6	10
Naval bases AM	15	12	8	15	3
Major ground forces HQ PGL	15	60	7	10	4
Brigade equiv. units PGL	34	100	120	12	14
Military/secret cities AM	10	-	-	-	-
Space launch/ASAT sites PGL	5	5	1	4	-
Surveillance radars/BMD PGL	75	3	2	2	2
Major civil targets AH	60	120	6	7	4

*Projected Deliverable Weapons
Aggregated by Type and Mission (step 6)*

Target Class – Weapon Type	Russia	China	DPRK	Iran	Syria	Totals
Counter WMD - PGL	336	257	98	78	22	791
- PGL/-EP	132	43	17	10	-	202
- PGL/-ER	84	12	24	6	8	134
- AM	19	23	5	5	6	58
NCA/C3 - PGL/-EP	12	12	6	6	6	42
Other Military - PGL	129	168	130	28	21	476
- AM	45	32	16	21	13	127
Civil - AH	60	120	6	7	4	197
Totals	817	667	290	149	80	2027

*Operationally Deployed Capabilities
and Delivery Systems (Steps 7-8)*

1. Hold nuclear weapons requirements for Russia in reserve, capable of complete operational deployment within 2 years. All other requirements/allowances operationally deployed.
2. Plan to use missiles as delivery vehicles for operationally deployed nuclear weapons to the extent possible. Maintain capabilities of B-52 and B-1 to deliver nuclear weapons in the event more weapons are needed than can be uploaded on SLBMs and ICBMs.
3. Enable tactical aircraft to carry nuclear weapons as a hedge against unexpected needs for weapon replacement or for more additional operationally deployed forces.

*Operationally Deployed Capabilities
and Delivery Systems (Steps 7-8)*

4. Required operationally deployed immediately ready weapons: $2027 - 817 = 1210$
5. 426 of 450 ICBMs assumed immediately ready @ 1 weapon each
6. 8 of 12 SSBNs out of overhaul assumed capable of immediate readiness @ (24 - 4) SLBMs nuclear-armed @ average of 4.9 weapons each = 784 weapons that can be made immediately available.
7. Add 40 SLBMs and 196 weapons for rotational pool
8. The weapons with the ICBM force but assumed not immediately available are counted as operationally deployed
9. Total operationally deployed weapons: $450 + 784 + 196 = 1430$
10. Note that upload of the 817 non-operationally deployed weapons held as a contingency against reemergence of Russia as an adversary would require multiple weapons on the ICBMs, or increased nuclear readiness of bombers.

*Stockpile Overhead and Reserves
for Technical Problems (Steps 9-10)*

1. Add 10% of above total for "overhead" requirements such as weapons in transit, maintenance, or reserved for tear-down and component testing: ~145 additional weapons not operationally deployed
2. Missile weapons in reserve as hedge against technical failure: 450 additional weapons of significantly different type for ICBMs + 980 of significantly different type for SLBMs. (Assumes diversity equivalent to 2 independent types of each weapon)
3. The total numbers of non-operationally deployed nuclear weapons would be 1575 if no manufacture of new weapons were possible. Of this total 1430 would be considered deployable.
4. Note that this is considerably more than need to hedge against the possibility that Russia switches from a potential to an actual adversary in this analytical baseline posture.

Additional Adjustments (Steps 11-15)

1. Maintain 800 nuclear bombs in the stockpile for support of nuclear programs of cooperation for allies. Of these, 100 are assumed deployed with allies. The remainder hedge against the need to arm the bombers or to support additional requirements for programs of cooperation with allies. Two significantly different types of bombs are assumed to guard against technical failure of a bomb type.
2. Note that the analytical baseline posture would represent an impressive modernization of US nuclear strike capabilities given the new weapons.
 - If the potential adversaries do not substantially increase the sizes of their nuclear stockpiles or deploy new weapons with substantial operational advantages, a US claim of "second-to-none" would seem justified.
 - Use of nuclear weapons against terrorists seems a remote possibility that would involve at most only very few weapons.
3. Assuming responsive production of 10 new nuclear weapons per month could justify reducing the number of non-operationally deployed nuclear weapons by perhaps two years of production or 240 weapons. We assume that production could be raised to two shifts by the second year, thus allowing non-operationally deployed weapons to be reduced by 360. This reduction is included in the number of non-operationally deployed warheads shown in the next chart.

Analytical Baseline Nuclear Posture

• Operationally deployed (warheads)		1430
» ICBMs:	450	
» SLBMs:	980	
• Non-operationally deployed (warheads):		1215
» Contingencies:	1070	
» Overhead:	145	
• Nuclear bombs:		800
» POCs:	100	
» Contingencies:	700	
• Total weapons:		3445

Operationally deployed weapons types: PGL-62%, PGL/-EP-12%, PGL/-ER-7%, AM-9%, AH-10%; New low yield weapons-82%, Medium-High yield weapons-18%

Alternative Analytical Baseline Nuclear Posture

- The alternative baseline posture makes the following reductions reflecting presumed US judgments that a smaller stockpile would not be excessively risky and would serve its interests. The targets thus eliminated from this analysis seem less important than those retained.
 - o Drop the weapons allowances sized for Syria
 - o Drop targeting of brigade equivalent units
 - o Cut weapons allowances for major ground forces HQ by 50%
 - o Drop allowance for Russian military cities
 - o Cut allowances for retaliation against major civil targets in Russia and China by 50%
 - o Reduce nuclear bombs for END and bomber uploads by 25%
- The following four charts provide the results of carrying out steps 1-15 given these assumptions.

Alternative Projected Deliverable Nuclear Weapons Requirements (step 6)

<i>Target and Weapon Type</i>	<i>Russia</i>	<i>China</i>	<i>DPRK</i>	<i>Iran</i>	<i>Syria</i>
ICBM sites (F/M) FPGL	312	125	12	12	-
Theater missile sites (F/M) FPGL	24	132	86	66	-
Strategic airbases FAM	12	18	5	5	-
Strategic submarine bases FAM	7	5	-	-	-
Nuclear storage FPGL/-EP	108	31	7	-	-
Nuclear R&D/prod PGL/-EP	24	12	10	10	-
CBW R&D/prod/store PGL/-ER	84	12	24	6	-
NCA C3 sites FPGL/-EP	12	12	6	6	-
Other airbases AM	20	20	8	6	-
Naval bases AM	15	12	8	15	-
Major ground forces HQ PGL	8	30	4	5	-
Brigade equiv. units PGL	-	-	-	-	-
Military/secret cities AM	-	-	-	-	-
Space launch/ASAT sites PGL	5	5	1	4	-
Surveillance radars/BMD PGL	75	3	2	2	-
Major civil targets AH	30	60	6	7	-

*Alternative Projected Deliverable Nuclear Weapons
Aggregated by Type and Mission (step 6)*

Target Class – Weapon Type	Russia	China	DPRK	Iran	Syria	Totals
Counter WMD - PGL	336	257	98	78	-	769
- PGL/-EP	132	43	17	10	-	202
- PGL/-ER	84	12	24	6	-	126
- AM	19	23	5	5	-	52
NCA/C3 - PGL/-EP	12	12	6	6	-	36
Other Military - PGL	88	38	7	11	-	144
- AM	35	32	16	21	-	104
Civil - AH	30	60	6	7	-	103
Totals	736	477	179	144	-	1536

*Alternative Operationally
Deployed Capabilities (Steps 7-8)*

1. Required operationally deployed immediately ready weapons:
 $1536 - 736 = 800$
2. 285 of 300 ICBMs assumed immediately ready @ 1 weapon each
3. 7 of 10 SSBNs out of overhaul (2 in for a total 12) and assumed capable of immediate readiness @ (24 - 4) SLBMs nuclear-armed @ average of ~3.7 weapons each = 515 that can be made immediately ready.
4. Add 40 SLBMs and 148 weapons for rotational pool
5. Total operationally deployed: $300 + 515 + 148 = 963$
6. Total non-operationally deployed warheads if no manufacturing of weapons is possible: $963 + 96$ for overhead = ~ 1060.
7. Assuming as before an infrastructure capable of producing 360 weapons in two years, the total non-operational stockpile would be 700 weapons.
8. Note that upload of the 736 weapons required if Russia reemerges as an adversary would require multiple weapons on the ICBMs, or increased nuclear readiness of bombers.

*Alternative Analytical Baseline
Nuclear Posture*

• Operationally deployed (warheads)		965
» ICBMs:	300	
» SLBMs:	665	
• Non-operationally deployed (warheads):		700
» Contingencies:	605	
» Overhead:	95	
• Nuclear bombs:		600
» POCs:	100	
» Contingencies:	500	
• Total weapons:		2265

*Constructing Alternative 2022
Nuclear Postures - Part 2*

1. Summarize each international security environment (ISE) focusing on the key factors that can be expected to motivate differences between the above *analytical baseline nuclear postures*, and the US nuclear posture that might logically be needed by 2022.
2. Project alternative 2022 US nuclear postures for each ISE by adjusting the analytical baseline posture to reflect the key factors identified above.

*Responses to Strategic Problems Posed by
Expansive Nuclear Caliphate (ENC) ISE*

1. Key aspects of the Strategic Competition:
 - a) Al Qaeda group secures control of Arabia.
 - b) Quickly arms modest Saudi missile force with covertly obtained nuclear weapons.
 - c) With this presumed protection, pursues revolutionary remaking of state structures in Arab/Islamic world.
 - d) Frightened ME/PG/NATO states willing to support a strategy of containment with US leadership
 - e) Russia, China, and Iran do not oppose US efforts
 - f) Budgetary and political costs a much reduced concern
 - g) ENC willing to take risks in aggressively probing for weakness
2. Strategy:
 - a) Deter/defeat ENC efforts to win gains though nuclear coercion
 - b) Enable additional allies to participate in their collective defense and share the risks of any necessary nuclear use
 - c) Make maximum effort to suppress ENC capabilities to threaten or attack the US, its allies and friends, or others.
 - d) Compete effectively with ENC efforts to avoid suppression by all practical means including cooperative efforts to block support for ENC nuclear improvements from other states.

*Responses to Strategic Problems Posed by
Expansive Nuclear Caliphate ISE*

3. Defenses:
 - a) Accelerate cooperative programs to deploy improving theater missile and air defenses for protection, assurance, cohesion of the allied containment effort and support of any necessary intervention against ENC.
 - b) Continue R&D and limited deployment of improving strategic defenses as response to potential long term ENC efforts to develop capabilities to attack distant states including the US. Include all plausible ENC means for delivering WMD.
 - c) Improve passive defense vs. CBW
4. Strike Capabilities:
 - a) Accelerate R&D and production of new precision effects nuclear and conventional weapons, especially vs. WMD targets and HDBT.
 - b) Deploy the additional types and numbers of conventional and nuclear capabilities needed to provide robust deterrence against the ENC.
 - c) Support allies' acquisition of improved conventional strike capabilities.
 - d) Support END programs for key allies new and old, including all the institutional arrangements needed to support planning and any necessary use of nuclear forces.

Responses to Strategic Problems Posed by Expansive Nuclear Caliphate ISE

5. C4ISR capabilities:
 - a) Develop and deploy capabilities for persistent surveillance, tracking of mobile missiles, effective BDA, identification of key targets and their structures and opposing WMD, especially vs. the ENC.
 - b) Establish capabilities to seal ENC borders against movement of WMD and especially nuclear materials and weapons in or out of its territory.
 - c) Create a high-speed C3 system netted with allies
6. Infrastructure:
 - a) Improve infrastructure to support accelerated R&D and production of all New Triad capabilities needed to win any extended competition to suppress and maintain ENC WMD capabilities – especially nuclear capabilities – at a level where the US alliance could carry out any necessary intervention against the ENC at tolerable risk.

*Changes to 2022 Baseline Nuclear Posture for ENC ISE**

1. 6 PGL/-EP vs. nuclear missile launchers in buried shelters
2. 12-48 PGL vs. widely dispersed nuclear missile launchers hidden in cover/buildings/open caves
3. 6 PGL/-EP vs. NCA/C3 bunkers
4. 12 PGL/-EP vs. nuclear weapons/C2 bunkers
5. 34 AM vs. other military targets
6. 4 AH vs. civil targets
7. Sum of above is 72-108 additional weapons for targeting ENC which translates into 80-123 additional immediately available weapons in turn translating into 100-147 operationally deployed plus 110-162 additional non-operationally deployed weapons.
8. 100 additional nuclear bombs from contingency stocks deployed or kept ready for quick possible deployment to perhaps 5 ME/PG allies under nuclear programs of cooperation
9. Achieving the new levels of contingency stocks of warheads would require production of as many as 210-310 new weapons. A case might also be made for producing 100 additional nuclear bombs to be added to contingency stocks.

**Basis for additional weapons requirements is explained in brief on "New Triad Capabilities" vs. ENC included in this volume. Weapons for "other (than WMD) military targets" are cut by 50% for the alternative nuclear stockpile.*

*Responses to Strategic Problems
Posed by "Fallen Nuclear Dominoes" ISE*

1. Key Aspects of the Strategic Competition:
 - a) Perceived opportunities and threats lead some states to abandon NPT and build nuclear weapons. Additional states hedge by limiting support for new anti-proliferation measures and moving toward the nuclear weapons threshold. Some states wanting to proliferate, but unable, opt for CBW.
 - b) Nonetheless, many states still see substantial value in nonproliferation.
 - c) While China and Russia may not support US global stabilization efforts, any competition from them is political not military.
 - d) A few aggressive new nuclear states pose risks testing the limits of their new power.
 - e) Budgetary and political costs of responding to this ISE are seen as reduced concerns.
2. Strategy:
 - a) Improve capabilities to contain and suppress threats posed by aggressive nuclear-armed states.
 - b) Deter/defeat rogue states' efforts to win gains at US or allies expense through nuclear coercion or use.
 - c) Enable more friends and allies to participate in their collective defense
 - d) Improve capabilities to provide extended nuclear deterrence to allies.
 - e) Improve early warning of nuclear proliferation to enable more effective political intervention.
 - f) Strengthen efforts to block international nuclear trafficking.

*Responses to Strategic Problems
Posed by "Fallen Nuclear Dominoes" ISE*

3. Defenses:
 - a) Accelerate cooperative programs with allies to deploy improving theater missile and air defenses for protection, assurance, willingness to contain rogues old and new.
 - b) Continue R&D and limited deployment of improving "strategic" defenses as response to rogues who will likely seek capabilities to attack CONUS.
 - c) Improve passive defenses vs. CBW.
4. Strike capabilities:
 - a) Accelerate R&D and production of new precision effects nuclear and conventional weapons especially vs. WMD, HDBT.
 - b) Increase nuclear stockpile numbers and types to provide robust capabilities against increased numbers and capabilities of rogues.
 - c) Support allies' acquisition of improved conventional strike capabilities.
 - d) Develop nuclear bombs tailored for programs of nuclear cooperation with allies.

*Responses to Strategic Problems
Posed by “Fallen Nuclear Dominoes” ISE*

5. C4ISR capabilities:
 - a) Develop and deploy capabilities for persistent surveillance, tracking of mobile missiles, effective BDA, identification and characterization of key target structures and opposing WMD, primarily for rogues.
 - b) Create a high-speed C3 system netted with allies.
6. Infrastructure:
 - a) Improve infrastructure to support accelerated R&D and production of all New Triad capabilities needed to suppress rogues and identify and carry out preventative interventions on a timely basis.

*Changes to 2022 Baseline Nuclear Posture for
“Fallen Nuclear Dominoes” ISE*

1. It seems likely that nearly all of the states that proliferate or prepare to do so are not going to be or become adversaries of the US.
2. US nuclear posture changes should emphasize improved nuclear capabilities for countering the threats posed by new rogues.
3. Based roughly on the lower end of the ENC analysis, and assuming two of the additional states that proliferate prove to be or become rogues, add the following capability to the US nuclear posture:
 - 72 PGL variants targeted vs. WMD or approximately 108 operationally deployed plus 108 more in reserve
 - 48 AM targeted vs. other military targets or approximately 72 operationally deployed plus 72 more in reserve
 - 12 AH targeted vs. civil targets or approximately 18 operationally deployed plus 18 more in reserve
4. Again, following the ENC analysis, we assume that the additional new nuclear rogues would lead to END support for 10 additional states thus calling for 200 nuclear bombs ready for deployment.
5. Achieving the new levels for contingency stocks of warheads would require production of as many as 400 new weapons. A case could also be made for producing an additional 200 bombs to be added to contingency stocks.

*Responses to Strategic Opportunities Presented
by "Back to the New World Order" ISE*

1. Key Aspects of the Strategic Situation:
 - a) Most of international community agrees on and reliably supports necessary uses of force and other resources to suppress global and regional instability and conflict. None of the major powers substantially oppose.
 - b) Nuclear proliferation problems in Iran and North Korea are effectively stabilized by political means. Taiwan no longer a flashpoint; Major powers cooperate in stabilizing Africa and effectively suppressing international terrorism.
 - c) Major power concert enables effective responses to crises and key improvements to non-proliferation regime. Stronger constituencies for broad nuclear reductions, FMCT.
 - d) Rest of world comes to expect major powers will fulfill goals of UN charter.
2. Strategy:
 - a) Maintain stability of relations with Russia and especially China while retaining a nuclear hedge against their renewed hostility.
 - b) Expand and strengthen mechanisms for multilateral maintenance of peace and security and the containment or halting of regional wars.
 - c) Contain and suppress any new rogues.

*Responses to Strategic Opportunities Presented
by "Back to the New World Order" ISE*

3. Defenses:
 - a) Continue cooperative programs with partners to deploy improved theater missile and air defenses for protection, assurance, willingness to contain the two rogues.
 - b) Continue R&D and limited deployment of improving strategic defenses as response to rogues and hedge against major powers.
4. Strike capabilities:
 - a) Pursue continued modernization of the nuclear posture with RRW while reducing its size.
 - b) Pursue research on additional types of new precision effects nuclear weapons vs. WMD, HDBT.
 - c) Continue development/production of improved conventional strike capabilities for potential use vs. remaining rogue states' WMD and HDBT, as hedge against power projection by a major power turned hostile, and for counter-terrorism purposes.
 - d) Provide allies access to US' improved conventional strike capabilities.

*Responses to Strategic Opportunities Presented
by “Back to the New World Order” ISE*

5. C4ISR capabilities:
 - a) Seek persistent surveillance, capabilities to track mobile missiles, effective BDA, identification and characterization of key target structures and opposing WMD capabilities especially for remaining rogues.
 - b) Pursue high-speed C3 system netted with allies.

6. Infrastructure:
 - a) Pursue continued improvement of nuclear weapons infrastructure.
 - b) Emphasize conventional forces infrastructure improvements as a counter to remaining rogues, means to reduce casualty costs of global stabilization role, and as hedge against breakdown of cooperation among major powers.

*Changes to 2022 Baseline Nuclear Posture for
“Back to the New World Order” ISE*

1. Reflecting the broad strategic concern between the US, Russia, and China, the greatly improved functioning of international mechanisms for maintaining global stability, and the strong global interest in reductions of nuclear stockpiles, make an agreement with Russia to limit operationally deployed nuclear weapons to no more than 600.
2. Reflecting continued concerns for rogue states, US operationally deployed weapons will be held in the same proportions by weapons type as shown for the aggregate of the three rogues in slide 13. Thus the operationally deployed weapons will include approximately 400 PGL, 60 PGL/-EP, 40 PGL/-ER, 80 AM, and 20 AH weapons.
3. As a hedge against contingencies including failures of weapons types and the reemergence of Russia and China as adversaries, retain 800 nuclear weapons as non-operationally deployed. These weapons will be held in the same proportions by weapons type as shown for the aggregate of Russia and China in slide 12. Thus, the reserve weapons will include: 480 PGL, 110 PGL/-EP, 50 PGL/-ER, 60 AM, and 100 AH weapons.

*Changes to 2022 Baseline Nuclear Posture for
“Back to the New World Order” ISE*

4. Go to the reduced numbers of delivery vehicles postulated for the alternative baseline nuclear posture.
5. Retain 600 nuclear bombs with 50 deployed in programs of cooperation with allies.
6. Note that early appearance of the “New World Order” ISE could make it more difficult to create the several new types of nuclear weapons in the baseline nuclear stockpile.

*Responses to Strategic Problems
Posed by “Adversarial Bipolarity” ISE*

1. Key Aspects of the Strategic Competition:
 - a) US seeks to suppress China’s nuclear capabilities while it pursues a strong level 3-4 capability.
2. Strategy:
 - a) Seek, as will China, to minimize prospects of war, prevail in war without initiating nuclear use, prevail in nuclear war with minimum escalation.
 - b) Assure allies that their interests will be carefully protected. *Prepare improved political and technical options for programs of nuclear cooperation.*
 - c) Seek to dissuade Russia and others from taking advantage of the US-China adversarial relationship.
3. Defenses:
 - a) China begins deployment of nuclear-armed BMD; deploys sophisticated penetration aids and provides “export versions” to others.
 - b) Accelerate improvement and expansion of “strategic” missile defenses.
 - c) Cooperate with allies on improved theater missile defenses for protection, assurance, and reliable willingness to support needed theater interventions.
 - d) Improve passive defenses vs. CBW.

*Responses to Strategic Problems
Posed by “Adversarial Bipolarity” ISE*

4. Strike capabilities:
 - a) Make no significant changes for any of the baseline adversaries except China, and assume no new adversaries.
 - b) Increase US capability to retaliate against urban targets as a response to expansion of China’s high yield strategic missile forces.
 - c) Emphasize precision effects capabilities for improved calibration/resolution of US strike operations for escalation control advantages.
 - d) Pursue R&D and production of additional new rapid reaction, precision effects, conventional and nuclear strike capabilities including improved long-range strike capabilities vs. naval forces.
 - e) Pursue improved HDBT strike capabilities to put China’s extensive HDBT shelter system at higher risk.
 - f) Provide allies access to US’ improved conventional strike forces.
5. C4ISR:
 - a) Seek capabilities for persistent surveillance, capabilities to track mobile missiles, effective BDA, identification and characterization of key target structures and opposing WMD, especially vs. China.
 - b) Build a high-speed C3 system netted with allies.
 - c) China assists some states in hiding their nuclear forces
6. Infrastructure:
 - a) Pursue broad infrastructure modernization, especially to support the bipolar competition.

*Changes to 2022 Baseline Nuclear Posture
for “Adversarial Bipolarity” ISE*

1. Initially deploy an additional 200 precision guided low yield (PGL) weapons to target expanding Chinese nuclear strike capabilities.
2. Initially deploy an additional 200 accurately delivered high yield (AH) weapons to strengthen deterrence of Chinese nuclear strikes against urban targets.
3. Shift 100 bombs from contingency stocks to programs of cooperation for Asian allies.
4. Production of nuclear weapons to meet the corresponding contingency and overhead requirements in the non-operationally deployed portion of the nuclear stockpile could require as many as 800-900 new weapons.
5. Prepare to build additional new types and numbers of nuclear weapons as required to target expanding Chinese nuclear/WMD strike capabilities.
6. Note that the additional weapons building requirements of this ISE could require as long as 3.5 years to complete given the infrastructure capabilities assumed in part 1 of this analysis.

*Responses to Strategic Problems
Posed by “Adversarial Tripolarity” ISE*

1. Key Aspects of the Strategic Competition:
 - a) Both Russia and China seek robust improvements to strategic capabilities while the US seeks to suppress their capabilities to the extent practical.
 - b) Competition between Russia and China cuts off their military technology cooperation.
2. Strategy:
 - a) Seek, as will Russia and China, to minimize prospects of war, prevail in war without initiating nuclear use, prevail in nuclear war with minimum escalation.
 - b) Seek to assure allies. Prepare improved political and technical options for programs of nuclear cooperation.
 - c) Seek to dissuade others from taking advantage.
 - d) Maximize nuclear capabilities within limited numbers.
3. Defenses:
 - a) *Accelerate improvement and expansion of strategic missile defenses.*
 - b) Cooperate with allies to improve theater missile defenses for protection, assurance, and reliable willingness to support theater interventions.
 - c) *China begins deployment of nuclear-armed missiles defenses; Russia upgrades its missile defenses.*
 - d) China and Russia deploy sophisticated penetration aids and provide “export versions” to others.
 - e) Improve passive defenses vs. CBW.

*Responses to Strategic Problems
Posed by “Adversarial Tripolarity” ISE*

4. Strike capabilities:
 - a) Make no significant changes for any of the lesser baseline adversaries and assume no new adversaries.
 - b) Increase operationally deployed nuclear forces in response to Russia’s and China’s active hostility and improvements and expansions of their nuclear forces.
 - c) Emphasize precision effects capabilities to allow improved calibration/resolution of US strike operations for escalation control advantages.
 - d) Carry out R&D and production of additional new rapid reaction, precision effects, conventional and nuclear strike capabilities, including improved long-range strike capabilities vs. naval forces.
 - e) Pursue improved HDBT strike capabilities to put China’s and Russia’s extensive HDBT shelter systems at higher risk.
 - f) Provide allies access to US’ improved conventional strike capabilities.
5. C4ISR capabilities:
 - a) Seek persistent surveillance, improved capabilities to find and track mobile missiles, effective BDA, identification and characterization of key target structures and opposing WMD capabilities.
 - b) Build a high-speed C3 system netted with allies.
 - c) China and Russia assist proxies to hide nuclear forces.
6. Infrastructure:
 - a) *US seeks broad infrastructure renewal for R&D and rapid production of new types of weapons, delivery systems, ISR capabilities to compete effectively with Russia, China.*

*Changes to 2022 Baseline Nuclear Posture
for “Adversarial Tripolarity” ISE*

1. Deploy ~1100 of the non-operationally deployed nuclear weapons in response to Russia’s changed status, for additional deterrence of urban attacks by China, to offset Russian and Chinese BMD improvements and deployments, and to target expanding Chinese and reemerging Russian WMD capabilities.
2. Add 200 bombs for contingency deployment to allies under programs of nuclear cooperation.
3. Begin emergency production of new nuclear weapons to restore the stockpile hedge against a failed weapon type. Note that as many as 2500 new warheads could be necessary if each operationally deployed weapon requires a backup. If the equivalent of three independent types can be produced for SLBMs, for ICBMs, and for bombs, then the corresponding backup requirement would be approximately 1250 new weapons. Given the assumptions made in part 1 about maximum weapons production rates, 2500 weapons would require more than 10 years to produce,

*Changes to 2022 Baseline Nuclear Posture
for “Adversarial Tripolarity” ISE*

4. Note also that in this ISE only, the contingency weapons for reemergence of an adversarial Russia would have been deployed, leaving failure of a weapons type as the dominant reason for maintaining either non-deployed weapons or the capability to build replacements quickly.
5. In this case, it may be sufficient to hedge only against the failure of any single weapons type. For this purpose, a production capability that is ready to produce a replacement for any failed type can allow the total number of weapons retained as a hedge to be substantially reduced. The reduction can approach the maximum production possible within the time considered tolerable to effect replacement of the failed weapon type, *multiplied by the total number of independent classes*. Of course US capability to produce nuclear weapons should also be sufficient to renew the stockpile over a reasonable time, such as perhaps 20-30 years.
6. Finally, we should note that the reduction of delivery systems posited for the alternative baseline force would make little sense for this ISE. The upload capacity of that force would be severely taxed by the postulated expansion of the force, and antagonism among the three major nuclear powers might lead to even larger expansions.

*Responses to Strategic Opportunities of
“Making Headway by Building Order” ISE*

1. Key Aspects of the Strategic Competition:
 - a) Major powers slowly becoming more engaged politically and economically. Security cooperation still limited and strong skepticism about prospects for more.
 - b) Progress in rolling back or changing hostile regimes and no new rogues or proliferators.
 - c) US alliances a mix of the status quo or growing stronger. More states seek US protection and security assistance than pursue self-help.
2. Strategy:
 - a) Consolidate successes, reinforce trends, including focus more pressure with friends and allies on containing remaining rogues.
 - b) Suppress rogues' nuclear and other WMD capabilities as far below level 3 as possible.
 - c) Enable more allies and friends to participate in their collective defense.
3. Defenses:
 - a) Continue cooperative programs with allies on improved theater missile and air defenses for protection, assurance, willingness to contain remaining rogues.
 - b) Continue strong program to develop improved strategic defenses as hedge against possibility that major powers turn more hostile.

*Responses to Strategic Opportunities of
“Making Headway in Building Order” ISE*

4. Strike capabilities:
 - a) Emphasize development and production of improved conventional strike capabilities for use vs. rogue states' WMD and HDBT, and all states' power-projection forces.
 - b) Pursue R&D for additional types of precision effects nuclear weapons vs. WMD, HDBT.
 - c) Allow allies access to US' improved conventional strike capabilities.
5. C4ISR capabilities:
 - a) Seek persistent surveillance, capabilities to track mobile missiles, effective BDA, identification and characterization of key target structures and opposing WMD capabilities especially for remaining rogues.
 - b) Pursue high-speed C3 system netted with allies.
6. Infrastructure:
 - a) Pursue infrastructure improvements to allow US to compete effectively if positive trends in the security environment stall or reverse.
 - b) Invest in developing applicable new technologies.

*Changes to 2022 Nuclear Posture for
“Making Headway in Building Order” ISE*

1. Posture might reasonably be similar to the alternative baseline.
2. “Headway” would make improvements in stockpile and nuclear weapons infrastructure more difficult to motivate.
3. Progress in developing and deploying conventional strategic strike capabilities that can safely substitute for nuclear capabilities would become more important.

*Responses to Strategic Problems
Posed by “Losing Ground” ISE*

1. Key Aspects of the Strategic Competition:
 - a) Increased hostility by Russia and China to US pursuit of global transformation.
 - b) Allies increasingly skeptical to US out-of-area military activities and seek assurance including strengthened security guarantees.
 - c) US must balance efforts to prepare for and dissuade challengers with the need to avoid generating fears that could accelerate adverse trends.
2. Strategy:
 - a) Suppress rogues’ nuclear and other WMD capabilities as far below level 3 as possible.
 - b) Dissuade more intense competition from rising powers.
 - c) Enable more friends and allies to participate in their collective defense and improve capabilities to provide extended nuclear deterrence to partners.
 - d) Increase readiness to improve nuclear strike capabilities against opposing WMD.
 - e) Meet requirements without increased numbers of nuclear weapons.
3. Defenses:
 - a) Accelerate improvement and expansion of missile and air defenses but do not pose a credible threat to Russia or Chinese abilities to deter US from attempting their annihilation.
 - b) Cooperate with allies on improved theater missile and air defenses for protection, assurance, and more reliable willingness to support theater interventions
 - c) Improve passive defenses vs. CBW.

*Responses to Strategic Problems
Posed by “Losing Ground” ISE*

4. Strike capabilities:
 - a) Emphasize development and production of improved conventional strike capabilities for use vs. rogue states' WMD and HDBT, and all states' power-projection forces.
 - b) Pursue R&D on new precision effects nuclear weapons vs. WMD, HDBT.
 - c) Allow allies access to US' improved conventional strike capabilities.
5. C4ISR capabilities:
 - a) Seek persistent surveillance, capabilities to track mobile missiles, effective BDA, identification and characterization of key target structures and opposing WMD capabilities.
 - b) Pursue high-speed C3 system netted with allies.
6. Infrastructure:
 - a) Emphasize infrastructure improvements to allow US to compete effectively should adverse trends in security environment continue.
 - b) Emphasize development of applicable new technologies.

*Changes to 2022 Baseline Nuclear
Posture for “Losing Ground” ISE*

1. The deteriorating international security environment could lead to either of two opposite judgments by the political leadership. It could see deeper reductions as possibly leading to an improving security environment and thus choose a posture similar to the alternative baseline. Alternatively, it could see a posture similar to the baseline as more appropriate if slowing reductions and maintaining a somewhat more robust posture seemed more prudent.
2. “Losing Ground” could make improvements in stockpile and nuclear weapons infrastructure easier to motivate.
3. Progress in developing and deploying conventional strategic strike capabilities that can augment or safely substitute for nuclear capabilities would be even more important than in “Making Headway” case.

2022 Nuclear Postures for Alternative ISEs

	Operationally Deployed Warheads	ICBM	SLBM	Non-operatnly deployed warheads	Bombs (or bomb/air del. missile mix)	Critng	Prog. of Coop.	Totals
Back to "New World Order"	600	300	300	800	600	550	50	2000
Making Headway	965	300	665	700	600	500	100	2265
Losing Ground	1430	450	980	1215	800	700	100	3445
Adversarial Bipolarity	1830	450	1380	1615	800	600	200	4245
Alt. Adversar. Bipolarity	1365	300	1065	1100	600	400	200	3065
Adversarial Tripolarity	2530	930	1600	2640	1000	700	300	6170
Fallen Nuclear Dominoes	1630	450	1180	1415	800	500	300	3845
Alt. Fallen Nuclear Dominoes	1165	300	865	900	600	300	300	2665
Expansive Nuclear Caliphate	1530	450	1080	1315	800	600	200	3645
Alt. Expansive Nuclear Caliphate	1065	300	765	800	600	400	200	2465

Observations and Conclusions

1. Building up an estimate for the size and nature of the future US nuclear posture is clearly a very judgmental process. Undoubtedly, those who provide official inputs to this process and construct official recommendations for what the US nuclear posture should be have developed more sophisticated and better informed approaches to doing so. Nonetheless, we can draw some general conclusions from this analysis that we expect would line up reasonably well with those that might be derived inside the government.
2. The many factors open to judgment in projecting the nature and size of future nuclear postures imply that those inclined to be more conservative will be able to make a respectable case for a future nuclear posture that is substantially larger than that allowed by the Moscow Treaty while those inclined toward reductions will be able to see a respectable case for far smaller and less sophisticated postures.

Observations and Conclusions

3. Both inclinations should have no trouble recognizing that the appropriate size and general nature of the future US nuclear posture will depend substantially on the nature of the international security environment the US finds itself in. And, it seems clear that the security environment can be very different by 2022 – while US capabilities to build new nuclear weapons in meaningful numbers and fast enough to meet potential needs may not have been reestablished much before then. Hedging against the potential requirements for additional operationally deployed weapons by keeping and sustaining large numbers of older weapons is expensive. Reestablishing the capability to build meaningful numbers of new weapons in a timely manner will also be expensive. But the sooner the US can do the latter, the less it will have to do of the former.
4. Looking at the results of this analysis as depicted in chart 57, the range of possible postures that might be needed to meet the various ISEs we have postulated as plausible by 2022 is quite large. The smallest of these postures corresponds to “Back to the New World Order” and “Making Headway in Building Order” is a close second. The largest of the postures is for the “Adversarial Tri-polarity” environment in which the both China and Russia have emerged as competitive strategic adversaries of the US. The largest of these three projected 2022 postures is roughly 3 times the size of either of the smaller postures.

5. Note further, that this largest of the projected 2022 nuclear postures requires employing all the upload capability of the current SLBM force plus uploading the MM force to an average of slightly over 2 warheads per missile. Alternatively, the bomber force could be moved to a higher level of readiness for nuclear missions. In addition, this posture would require far more production of new warheads to restore the hedge against failure of a weapons class than could be produced in two years. . . more than ten years of production would be required at the maximum rates we have assumed for the planned new production capabilities.
6. Of course the relative changes in the nuclear postures are easily explained. The rogue states – as we have characterized them – are relatively small in size and number. Thus they do not generate large numbers of targets for reasonable US deterrence or defeat efforts. In contrast, scenarios that assume that Russia and or China either become adversaries or alternatively move in directions that make clear that they are unlikely ever to be adversaries – can add or subtract very large numbers of targets that would be reasonably the objects of US deterrence or defeat efforts.

7. Finally, note that bombs to support extended nuclear deterrence guarantees to current and possible future allies are a bigger part of the scenarios featuring expanded proliferation by rogues or adversarial relations with one or both of the major nuclear powers than of the baseline postures that correspond to a projection of today's security environment. How much bigger a role US extended nuclear deterrence might actually play in the future is hard to say.

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III. BACK TO THE “NEW WORLD ORDER”



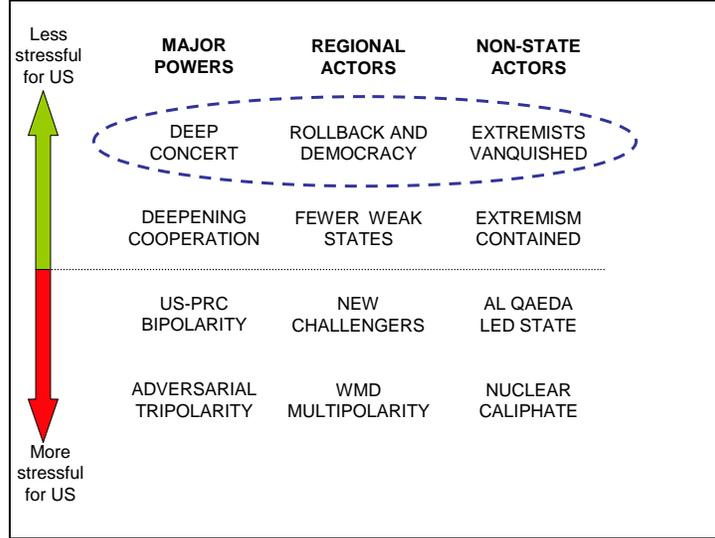
BMT Project
Subtask on Thinking Through
Alternative Security Environments

Back to the “New World Order”

Brad Roberts
September 24, 2007

Key Questions

1. What are the basic characteristics of this particular security environment?
2. What is the primary strategic challenge to the US?
3. What particular military problems might the US confront?
4. What strategic response would the US want to muster?
5. What general military posture would best support US objectives?
6. What would the US seek from each of the elements of the New Triad?
7. For strategic strike, what broad objectives would guide US planning?
8. What would be the targeting problem?
9. What would the US seek from the different elements of strategic strike?
10. For the nuclear force, what characteristics would be desirable?
11. What nuclear force posture would be suitable?
12. What strategy and policy context would best serve US interests?
13. What would threat reduction encompass in this environment?
14. Would this environment seem more certain?



What Are the Basic Characteristics?

Regions:

- Partial success in WMD rollback.
- Success a result of substantial agreement among the major powers to cooperate to sanction proliferators and induce policy and/or regime change.
- Some WMD-arming rogues remain.
- Some new rogue leaders emerge and aspire to WMD.
- Regions generally stable but some important weak states remain.

Violent extremism:

- Continuing turmoil in Islamic world but catastrophic terrorism not being pursued.
- Violence is focused on "apostate regimes" and not the "Far Enemy."

Major powers:

- See their roles and responsibilities in roughly comparable terms and as aligned with the vision of the UN Charter—stakeholders and guarantors.
- Have no vital interests in conflict.

Key observations:

- This is not "happily ever after."
 - Many deep sources of instability.
 - Triumph of liberalism globally intensifies insecurity of remaining illiberal states.
 - Nervousness about a possible return to disorder.
- But in this world, the major powers and rising powers have the will and ability to suppress the worst manifestations of these conflicts.

What is the Primary Strategic Challenge to US?

Regional actors opposed to the norms and institutions of the New World Order.

What Particular Military Problems Might the US Confront?

1. Newly nuclear-armed states seek to coerce and compel the US and its friends and allies.
2. Newly nuclear-armed states project power at the conventional military level, within or beyond a region, with the conviction that their threat of nuclear retaliation will safeguard their interests.

What Strategic Response Would the US Want to Muster?

1. US would want to consolidate gains made in democratization and nonproliferation:
 - By strengthening governability and stability of the powers in transition.
 - By enhancing peace and security in each of the subregions.
2. US would want to contain and deter and where necessary and possible defeat WMD-armed rogues.
3. US would want to address the problems in the poorer world that, left to fester, could erode order.
 - Cooperating to contain or halt wars, pressure regimes to liberalize, suppress international terrorism.

What General Military Posture Would Best Support US Objectives?

- Robust power projection against the occasional military challenge by a WMD-armed rogue.
- Power projection in concert with others to cope with weak and collapsing states—rising salience of stabilization and reconstruction.
- Suppressing of international nuclear trafficking, especially to terrorists.
- Hedging against possible renewal of major power strategic competition for advantage.

What Would the US Seek From Each Element of the New Triad?

Infrastructure:

- Tailored to dissuade and not for priority production of new defeat capabilities.
- Uncertainty about durability of "back to the New World Order" would fuel debate about how much latent capability to invest in.

Defenses:

- Decreased reliance, tailored to remaining rogue(s) and "restrained" so as not to "incite" worries in China and Russia.

ISR:

- Tailored for a narrow set of potential regional adversaries.

Strike:

- Non-kinetic: cyber and SOF of potentially high utility against vulnerable rogue assets but threat would not justify a larger program.
- Kinetic:
 - Non-nuclear: high value for US for purposes of deterrence and defeat.
 - Nuclear: for purposes of deterrence—and thus plausible for use for war termination, retaliation, and preemption.
 - Replacement warheads seem likely but not new capabilities.
 - Need to hedge might seem convincing...for a while.

For Strategic Strike, What Objectives?

To fight wars by playing to US strengths at the conventional level.

To win wars on US terms, by achieving US objectives with the lowest possible collateral damage.

To deny rogues any ability to escalate.

What Would be the Targeting Problem?

Leadership targets: potentially numerous with movement frequent and well rehearsed.

Military targets:

- Strategic military: potentially 20s or even low 100s, with WMD assets likely dispersed and hidden.
- Hardened: steadily growing in number and depth.
- Other: conventional power projection targets could be numerous.

What Would the US Seek from the Different Elements of Strategic Strike?

See above.

For the Nuclear Force, What Characteristics Would Be Desirable?

Usable in small numbers for tailored effects in some conceivable circumstances.

Given the potential for use in small numbers, high value on surety.

For the Nuclear Force, What Force Posture Would Be Suitable?

Alert posture:

- Driven principally by force balances with major powers, not regional proliferators.

Baseline posture:

- Theater capabilities might seem of high value to US allies and friends.

What Strategy and Policy Context Would Best Serve US Interests?

In the a-d-d-d construct, emphasis would be on assurance and dissuasion:

- Assurance: of those betting that the New World Order does not require advanced hedging.
- Dissuasion: of those who might seek to gain strategic dominance with a rapid sprint after a long-term covert program.

What Would Threat Reduction Encompass?

Nonproliferation is alive and thriving in this future.

- Residual interests among remaining rogues and terrorists would likely be a source of high-level concern in international community, enhancing its willingness to undertake significant actions.
- Treaty regime would have to continue to adapt to deal with rising demands for nuclear power.
- Debate about how to lend additional momentum to the nonproliferation effort would invite intensified debate about how far and how quickly the established Nuclear Weapons States should proceed with disarmament.
 - There would be a large domestic and international constituency for dramatic action, including CTBT, FMCT, and deep cuts in arsenals.

Threat reduction vis-à-vis major powers:

- Risks of an intensification of strategic competition are low in this environment.
 - Potential value of formal and/or informal restraint agreements aimed at lending transparency, predictability, and stability to the development of the strategic postures of the major powers.

Would this Environment Seem More Certain?

Probably.

- Many would have the sense that history re-righted itself after a dangerous diversion in the second decade after the end of the Cold War.
- But some would see the lessons differently, arguing that in an anarchic international system the major powers will only rarely find it in their collective interest to police the international system in a way that meets the demands for order and justice of the vast majority of its members.

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IV. MAKING HEADWAY IN BUILDING ORDER

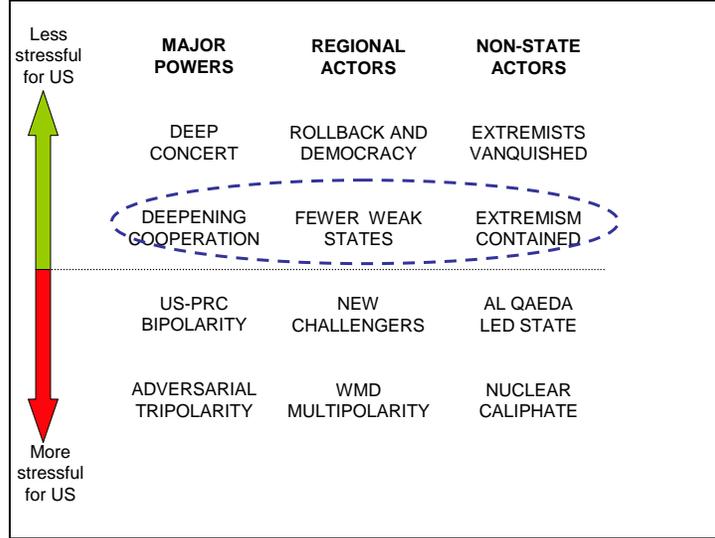


BMT Project Subtask on Thinking Through Alternative Security Environments Making Headway in Building Order

Brad Roberts
July 26, 2006

Key Questions

1. What are the basic characteristics of this particular security environment?
2. What is the primary strategic challenge to the US?
3. What particular military problems might the US confront?
4. What strategic response would the US want to muster?
5. What general military posture would best support US objectives?
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11. What nuclear force posture would be suitable?
12. What strategy and policy context would best serve US interests?
13. What would threat reduction encompass in this environment?
14. Would this environment seem more certain?



What Are the Basic Characteristics?

Major powers:

- Not returning to more competitive ways.
- Economic and political engagement slowly but steadily deepening.
- But still limited security cooperation and still strong doubts about the longer term.

Regions:

- Progress but not full success at rollback and regime change.
- No new rogues or proliferators emerge.
- Regions generally stable but some important weak states.
- US alliance relations are a mix of status quo and growing even stronger. More states seek US protection and security assistance than go self-help route.

Violent extremism:

- Reduced but not yet eliminated. US and allies well protected and violence is focused on "apostate regimes."

General: globalization and democratization proceeding without significant new ideological backlash.

What is the Primary Strategic Challenge to US?

Consolidating successes and reinforcing trends.
Coping with the instabilities posed by weak states and the occasional aggressive regime.

What Particular Military Problems Might the US Confront?

1. Collapsing WMD-armed states.
2. Aggressive WMD-armed rogues.
3. Rising powers that might at some future time choose peer adversarial competition.

What Strategic Response Would the US Want to Muster?

1. US would want to project power into weak and collapsing states for stabilization and reconstruction missions.
2. US would want to contain and deter WMD-armed rogues and also be prepared to defeat at low risk should that prove necessary.
3. US would want to cope effectively with the "loose nukes" problems generated by weak or collapsing WMD-armed states.
4. US would also want to extend deterrence to allies and partners in unstable regions/zones.
5. US would want to dissuade rising powers from choosing to compete with the US.

What General Military Posture Would Best Support US Objectives?

High value attributes:

- Conventional power projection to unstable regions.
- Capable against improving but not highly sophisticated asymmetric counters to US power.
- Well hedged against possible future major power challengers.

What Would the US Seek From Each Element of the New Triad?

Infrastructure:

- Tailored for flexibility as hedge against future major power competition.

Defenses:

- Generally less important than perceived today.
- MD tailored to a small number of modestly armed regional powers.
- MD capable of out-racing a major power in a defense-offense sprint.
- Passive defenses against CBW scaled to regional actors.

ISR:

- An "unblinking eye" over remaining rogues.

Strike:

- Capable of achieving desired strategic effects by non-nuclear means against any regional adversary—in combination with missile defenses.
- Nuclear weapons held for retaliation and war termination in extremis.

For Strategic Strike, What Objectives?

- To fight wars by playing to US strengths (conventional rather than nuclear).
- To win wars on US terms (low collateral damage, decisive effects).
- To restrain the efforts of WMD-armed rogues to coerce their neighbors or the US with nuclear threats through a credible threat of preemption.

What Would be the Targeting Problem?

For defeat: the cumulative target set of a handful of weak but WMD-armed states.

- Leadership targets: few in number.
- WMD targets: scores but generally vulnerable (but difficult to kill promptly by non-nuclear means).
- HDBT: numerous and growing, including going deeper.
- Other military targets appropriate for strategic strike: not numerous.

For dissuasion: the nuclear capabilities of potential future major power adversaries. Overarching objective: continued vulnerability of their political, military, and strategic targets to overwhelming US retaliation.

What Would the US Seek from the Different Elements of Strategic Strike?

Kinetic:

- Nuclear vs. non-nuclear:
 - US leaders would have strong preference for non-nuclear means (non-nuclear strike in combination with BMD) to achieve all strategic effects.
 - Nuclear weapons would be held for purposes of retaliation against WMD-willing rogues and for war termination in extremis.

Non-kinetic:

- Cyber might offer particular promise against rogue state militaries that rely on outdated equipment or recent off-the-shelf purchases.
- SOF could operate with significant latitude in weak states and in rogue states with significant internal public opposition.

For the Nuclear Force, What Characteristics Would Be Desirable?

Capable of operating effectively at levels of escalation opened up by adversaries choosing to escalate.

Usable in small numbers for tailored effects in some conceivable circumstances.

- US would want to be sure that they will go where they're supposed to go and do what they're supposed to do and communicate with the user until they're done.

For the Nuclear Force, What Force Posture Would Be Suitable?

Alert posture:

- Generally low—or at least matching whatever posture is operative in Russia and China.
- Primary mission: delivering relatively small numbers of weapons in a war that takes shape as a result of mounting crisis.
- That small number rapidly alertable or highly survivable if not actually "alert."

Baseline posture:

- With significant capability to increase the operationally deployed force against potential reemergence of a peer adversarial threat.

What Strategy and Policy Context Would Best Serve US Interests?

In the a-d-d-d construct, emphasis would be on dissuasion:

- Of next rising powers.
- Of RF and PRC recidivism.
- Of next rogues.

Assurance of friends, allies, rising powers, and other WMD-capable states that they need not aggressively hedge against a future sudden deterioration in the security environment would also be a priority.

On deterrence:

- US would want to persuade rogue leaders of its will and ability to use nuclear weapons in numbers small and large in the circumstances they might create.
- But US would also want to keep nuclear threshold high so as not to legitimize rogue use of nuclear weapons.
- Extended deterrence remains a central US preoccupation in this scenario. But it would not worry policymakers as much in this environment as in those involving major uncertainties about the major powers.

What Would Threat Reduction Encompass?

Vis-à-vis major powers:

- Wartime: Not deemed a central problem.
- Peacetime: "Arms race stability" would not be a significant preoccupation. Focus on rolling back capabilities and lending predictability to trends.

Vis-à-vis regions:

- Nonproliferation would be seen as gaining strength in this environment.
- US would want to utilize these norms to constrain rogue state behavior—and to justify punitive measures.

Would This Environment Seem More Certain?

Not very.

- Some would feel confidence from trend lines and emphasize the "wins" that had helped catalyze them, leading them to argue that to shape the future the US must be more restrained in its exercise of power.
- Others would be more wary of trend lines and emphasize the likelihood of further "losses" and "draws," leading them to argue that to shape the future the US must be more pro-active in developing and using its power.

There would be some continued hedging by some major and medium powers, but there would also be rising interest in how to stabilize hedging competitions in order that they not become self-fulfilling.

US would likely give significant emphasis to cultivating with the other major powers common perceptions of the challenges in the security environment—and the common interests in meeting them.

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V. LOSING GROUND



BMT Project Subtask on Thinking Through Alternative Security Environments

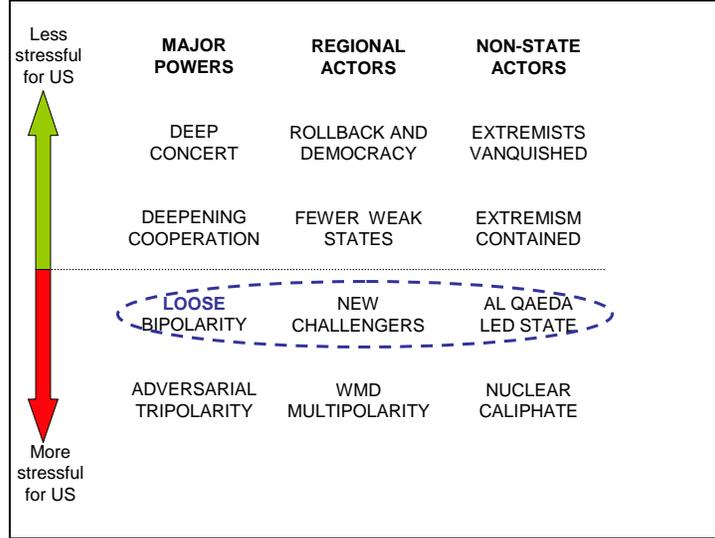
Losing Ground

Brad Roberts

July 26, 2006

Key Questions

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2. What is the primary strategic challenge to the US?
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What Are the Basic Characteristics?

Major powers:

- Russia, China, and other rising powers increasingly resistant to US projects in their regions and beyond.
- Economic interdependence remains a significant factor but with it comes increasingly fractious debates about who bears the burden of what changes to trade, financial, employment, or other policies.
- Increasing competition for military advantage in both strategic and power projection capabilities.

Regions:

- A significant failure of rollback leads to further but localized proliferation—no regional spillover effects, whether in Northeast or Southwest Asia.
- Democratization and development are faltering in many subregions.
- US allies distance themselves from US in response to popular resistance to US "out of area" military activities.
- Political instability leads to the emergence of new regimes ideologically opposed to US influence and values and willing to contest the US regional presence.

Violent extremism:

- Radical Islamists succeed in overthrowing the regime in a weak, non-WMD state.
- Their attacks on US interests globally and on the US itself grow more frequent and destructive. But they do not or cannot embrace WMD.

What is the Primary Strategic Challenge to US?

Restraints on its freedom of maneuver to project power into regions of concern imposed by WMD-armed states, both minor and major.
Heightened sense of homeland vulnerability.

What Particular Military Problems Might the US Confront?

1. Major powers using military force in their regions in ways that offend international norms and call US security guarantees into question—and thus invite questions of how the US might respond.
2. Major powers projecting force into the Middle East to secure their interests without regard to preferred US regional solutions.
3. Regional conflicts in which adversaries employ WMD and external powers are called upon to restore the peace.
4. Rising demands from regional states allied with or otherwise sympathetic to the US for externally provided security.

What Strategic Response Would the US Want to Muster?

1. US would want to project power against WMD-armed powers, whether regional or major.
2. US would want to contain and deter and where necessary and possible defeat WMD-armed rogues—and to cope with the associated “loose nukes” problems such crises would generate.
3. US would also want to extend deterrence to allies and partners in unstable regions/zones. It would also want to enable more partners to participate in their collective defense.
4. US would want to dissuade rising powers from choosing more intense competition with the US.

What General Military Posture Would Best Support US Objectives?

High value attributes:

- Conventional power projection to unstable regions.
- Capable against improving asymmetric counters to US power.
- A strategic toolkit tailored to contain and control escalation by WMD-armed adversaries.
- Competitive with developing capabilities of major power challengers and hedged against their potentially more intense future competition.
- The capacity to compete in a more eroded security environment that is developed in ways that do not make matters worse in themselves.

What Would the US Seek From Each Element of the New Triad?

Infrastructure:

- Tailored for efficient production of new capabilities but also composed so as to out-sprint a major power adversary seeking to gain some advantage.

Defenses:

- Missile defenses tailored to provide absolute protection against regional powers and limited protection against major powers.
- Passive defenses against CBW capable against both regional and major powers.

ISR:

- A capability that can be readily refocused on new priorities (a global, "all seeing" system would be useful but likely beyond US means in this timeframe).
- A strong baseline of understanding of a wide array of potential adversaries.

Strike:

- Capable of achieving desired strategic effects by non-nuclear means against any adversary—in combination with missile defenses.
- Nuclear weapons for deterrence, war termination, limited counterforce.

Think of 2 basic postures (invoking the DSB study on strategic strike)

1. Vis-à-vis minor powers: a posture wholly negating their strategic leverage over US.
2. Vis-à-vis major powers: a posture imposing restraints on their actions in limited wars for limited ends that does not also jeopardize their ability to pose a credible threat of retaliation in those scenarios they may imagine in which the US seeks their complete annihilation.

For Strategic Strike, What Objectives?

To fight wars by playing to US strengths at the conventional level.

To win wars on US terms, by achieving US objectives with the lowest possible collateral damage.

To deny minor powers any ability to escalate.

To retaliate against major powers and to hold out the threat of significantly more damage yet to be done if they counter-escalate.

What Would be the Targeting Problem?

Fundamentally different challenges between minor and major powers.

Minor powers:

- Few leadership targets.
- More numerous hardened and deeply buried targets.
- Few military targets, though some important WMD ones.

Major powers:

- Leadership targets: potentially many.
- Hardened targets: many, including some very hardened.
- Military targets: many, though number US might choose to strike could be few.

What Would the US Seek from the Different Elements of Strategic Strike?

Kinetic:

- Nuclear vs. non-nuclear:
 - US leaders would have strong preference for non-nuclear means (non-nuclear strike in combination with BMD) to achieve all strategic effects.
 - Nuclear weapons would be held for purposes of preemption and retaliation against WMD-willing rogues and for war termination purposes against major powers.

Non-kinetic:

- Cyber seems promising against regional powers and an urgent priority vis-à-vis major powers.
- SOF could contribute significantly against both regional and major powers.

For the Nuclear Force, What Characteristics Would Be Desirable?

Capable of operating effectively at levels of escalation opened up by adversaries choosing to escalate.

Usable in small numbers for tailored effects in some conceivable circumstances.

- Not clear that much improved capability against HDBT is a high priority in this scenario.
- Clearer that interest would rise in how to use nuclear threats/strikes to restrain use of CBW.

Given the potential for use in small numbers, high value on surety.

- US would want to be sure that weapons used in small numbers go where they're supposed to go and do what they're supposed to do and communicate with the user until they're done.

For the Nuclear Force, What Force Posture Would Be Suitable?

Alert posture:

- Capable of surviving a skillful first strike by Russia or China.

Baseline posture:

- Large and diverse enough to deal with the escalatory challenges in a major power confrontation under the nuclear shadow.
- Theater capabilities would seem of high value.

What Strategy and Policy Context Would Best Serve US Interests?

In the a-d-d-d construct, emphasis would be on assurance:

- Of rising powers: that they need not hedge too aggressively against a return of peer adversary competition.
- Of allies: that they need not anticipate defecting from current practices and thus setting trend lines back in the wrong direction.
- Key implication: US strategic posture would have to evolve in ways that would not be seen as making matters worse.

Dissuasion would seem like a losing but not quite lost cause, as attention shifts to de-motivating potential future choices for competition by rising powers.

On deterrence:

- US would want to persuade potential future challengers of its will and ability to use nuclear weapons in numbers small and large in the circumstances they might create.
- But it would also want to keep nuclear threshold high so as not to legitimize use of nuclear weapons by either regional or major powers.
- Extended deterrence would remain a significant US concern but in somewhat new circumstances.

What Would Threat Reduction Encompass?

Vis-à-vis major powers:

- In wartime: not a major concern here.
- In peacetime: "Arms race stability" would be a matter of rising interest, with some hope that it might be possible to escape more intense and destabilizing competitions.

Vis-à-vis regions:

- Nonproliferation would be seen as a losing but not quite lost cause.
- US would value norms as a way to distinguish right from wrong and to escape the complaint that its nonproliferation efforts are merely punitive acts against challengers to its power.

Would this Environment Seem More Certain?

No.

- More "losses" and "draws" than "wins" would lead many to see trends as headed in the wrong direction.
- Others would hope that more concerted US action might reverse trends.
- There would likely be significant debates about how much hedging is necessary and how much to actually bring into being the capabilities necessary for a world that has deteriorated further.

On hedging in this environment:

- All major powers and many medium powers would face the challenge of how to hedge against a future erosion of the security environment without making more likely the circumstance they least desire.
- This isn't just a US problem and the US ought to seek to influence the hedging strategies of others in ways that serve its interests.

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VI. ADVERSARIAL BIPOLARITY



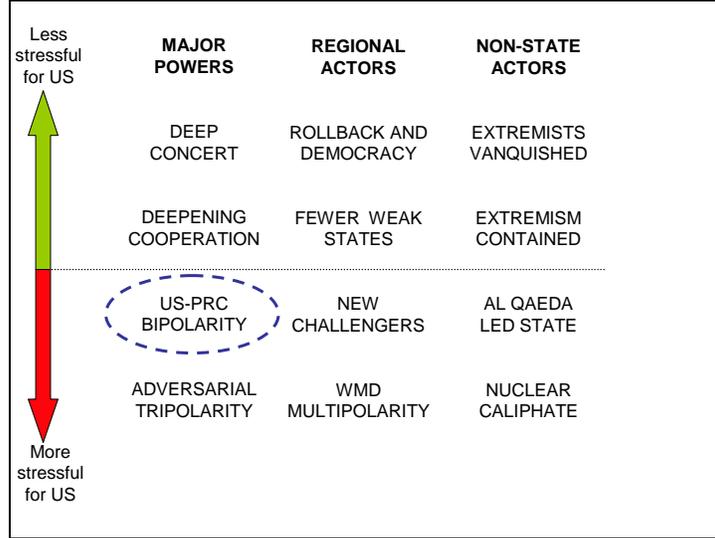
BMT Project
Subtask on Thinking Through
Alternative Security Environments

Adversarial Bipolarity

Brad Roberts
July 26, 2006

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What Are the Basic Characteristics?

Major power competition is the dominant theme and within that the US-PRC relationship is the dominant and most troubling one.

- China competes with the US for strategic advantage in Asia and beyond.
- Russia remains weak, relevant only to its "near abroad."
- Rising powers other than China not a factor in this timeframe.

Regions: zones of competition for influence but, other than Middle East, not themselves generators of larger instability.

Violent extremism: has not erupted into a significant new form.

Getting to this future requires a catalytic event:

- War over Taiwan:
 - China loses and vows to fight again another day—with a much more potent force.
 - US loses, acrimoniously debates ceding the Taiwan issue permanently, but sees the war as China's opening salvo in its peer adversarial competition.

This Isn't a Return to the Cold War

The competition for advantage of various kinds would seem familiar and bring some seemingly familiar questions about stability.

But there would be no "iron curtain" dividing sides.

- China not looking to territorial conquest.
- Competitive tendencies would be dampened by experience of current decades.
- But there would be no expectation of deeper economic integration or political cooperation.

What is the Primary Strategic Challenge to US?

Chinese efforts to inhibit US freedom of maneuver:

- Efforts by China to challenge US supremacy in the neighboring maritime environment, for regional power projection, in the SLOCs, and perhaps also in the space and cyber realms.
- Efforts by China to project conventional power into regions of significant US interest so as to contest US influence.
- China's development of relations with military proxies in regions other than East Asia and its assistance to them to develop their asymmetric counters to US power projection, including survivable WMD and BMD penetration aids.

What Particular Military Problems Might the US Confront?

1. Potentially: a renewal of military conflict over Taiwan, by one side or the other to recreate the status quo ante (before the posited conflict that went poorly from their perspective).
2. Containment of China's escalatory choices in such a conflict. Not Armageddon but "limited wars for limited ends under the nuclear shadow."
3. Military incidents at sea driven by contested energy claims and related PRC efforts to deny US uncontested sea control.
4. PRC attempts to coerce US allies and partners.
5. Sudden PRC breakthroughs with new disruptive technologies or operational modes (e.g., space attack).

What Strategic Response Would the US Want to Muster?

1. US would want to compete with developments in the PRC strategic posture to preserve an effective US strategic posture.
2. US would want to resist attempted PRC coercions of the US and its allies and partners and to otherwise assure those allies and partners.
3. US would want to deter, defeat, and where useful and practical, punish acts of aggression by PRC or its proxies.
4. US would want to reinforce nonproliferation and induce some PRC restraint in this regard.
5. US would want to dissuade Russia and other potentially rising powers from attempting peer competition with the US.
6. US would want to assure itself that it is up to the challenges of another peer adversarial competition.

What General Military Posture Would Best Support US Objectives?

High value attributes:

- Conventional power projection to the zones of competition.
- Extended deterrence.
- Capable against advanced asymmetric counters to US power (e.g., CBW, space, cyber).
- Escalation control for "limited wars under the nuclear shadow."
- Technologically superior to China's improving capabilities resulting from its productive capitalist economy (with both industrial and post-industrial elements).

What Would the US Seek From Each Element of the New Triad?

Infrastructure:

- Substantially tailored to the ongoing competition.

Defenses:

- Theater missile defenses would be essential to assurance of East Asian allies and protection of key power projection assets in crisis and war.
- CONUS missile protection of high value and US may value defense dominance but find it not viable in this scenario/timeframe.
- Passive defenses against CBW in theaters of competition.

ISR:

- An "unblinking eye" over China would be desirable but challenging in this timeframe—but US would take steps to try to create it.

Strike:

- Not (just) for Armageddon but usable for decisive benefit in conflicts with PRC proxies or directly involving them but for "limited ends under the nuclear shadow."

For Strategic Strike, What Objectives?

To play to US strengths at the conventional level of war and in the non-nuclear aspects of the New Triad.

To win wars on US terms, by achieving US objectives with the lowest possible damage, especially to civilians among US allies and within China.

To “control” China’s escalation at each threshold:

- To 1st use.
- To 2nd use.
- To last resort use.

Strike capability to effectively:

- Destroy PRC naval power projection assets.
- Cripple PRC tools for managing escalation (C4ISR, strike platforms, strike bases).
- Inflict commensurate retaliation.

What Would be the Targeting Problem?

In this time frame in this scenario, China is likely to be accelerating its efforts to re-posture its strategic strike forces so as to reduce their vulnerability to US preemption.

Their success in reducing that vulnerability would depend significantly on countervailing US efforts to negate the Chinese deterrent.

China’s C2 centers are underground and going deeper, a trend likely to accelerate in this period.

Other leadership targets would be few but well protected. China’s “nuclear defense” effort includes many thousands of km of tunnels for protecting leaders and other critical assets.

Other military targets would number in the thousands.

What Would the US Seek from the Different Elements of Strategic Strike?

Kinetic:

- Nuclear vs. non-nuclear:
 - US would want to not make 1st use of nuclear weapons so as not to legitimize China's nuclear use, and thus would rely heavily on conventional strike for defeating their power projection and controlling escalation.
 - But US would need credible nuclear options.

Non-kinetic:

- Cyber would be very prominent in China's tool kit and US should be prepared both to defeat its efforts and wage its own.
- SOF could play a significant role in disabling a few high priority targets that could otherwise be crippled only by nuclear means.

For the Nuclear Force, What Characteristics Would Be Desirable?

Credible for the high end of the conflict spectrum.

Usable in small numbers for tailored effects.

Effective against "reachable" HDBT. But reaching C2 targets may not be seen as necessary in wars US intends to keep limited.

Highly alert: capable of responding quickly to sudden flashpoints.

With sufficient "genetic diversity" to enable high confidence sustainment without very large numbers of replacement weapons.

For the Nuclear Force, What Force Posture Would Be Suitable?

Alert posture:

- Chinese preemption of CONUS forces not a concern in this timeframe.
- Chinese preemption of in-theater forces by direct attack or SOF is a concern.
- Posture should be capable of sustaining operations, even if limited, against a China that is unwilling to either escalate or quit.

Baseline posture:

- Sized and scoped to counter adversary escalation options.

Key issue: would a renewal of US tactical and/or theater nuclear systems in Asia seem necessary as a way to match China's theater nuclear systems?

- If land-based, what steps would the US need/want to take to enable an element of allied participation/control of their use?
- If sea-based, what further developments in Chinese (and Russian) forces might be anticipated?

What Strategy and Policy Context Would Best Serve US Interests?

In the a-d-d-d construct, the emphasis would be on deterrence and defeat of Chinese aggression and coercion.

On deterrence:

- US would want to persuade Beijing of its will and ability to use nuclear weapons in numbers small and large in the circumstances Beijing might create.
- US would also want to keep nuclear threshold high so as not to legitimize China's use of nuclear weapons.
- In this scenario, extended deterrence would return as a central US preoccupation.

On assurance: US would again face problem of allies concerned that too competitive a US response would intensify instability.

On dissuasion: could be seen as a lost cause vis-à-vis China but might be seen as relevant vis-à-vis Russia and other rising powers.

What Would Threat Reduction Encompass?

In major power dimension:

In wartime: US would need to be ready for full array of advanced asymmetric counters to its conventional power.

In peacetime:

PRC-US: "arms race stability" would reemerge as a preoccupation.

- US would likely seek to move toward future defense dominance.
- Whether US could win such a race in this timeframe is debatable.

US-RF: US would want to dampen any incentives for Russia to act to complicate the new strategic landscape.

- Russia would watch warily the unfolding offense-defense competition between PRC and US and worry that their racing would bring into being postures capable of preemption against Russia.

Vis-à-vis regions:

In wartime: US should be prepared for possibility that regional adversaries would be able to employ advanced asymmetric tools because of Chinese assistance.

In peacetime: Nonproliferation remains viable in this future environment, although on a limited basis, and the US would want to utilize these norms to constrain PRC assistance to proliferators.

Would This Environment Seem More Certain?

Yes. Peer competition would be seen as an inevitable result of peer relations, with the Taiwan war interpreted as confirmation of coming conflict.

The competition for advantage of various kinds would seem familiar and bring seemingly familiar questions of arms race and crisis stability.

But there would be no Iron Curtain.

- Economic interdependence would remain.
- Different visions of how to organize societies might inflame the competition but there would be no deep ideological contest for global stakes.
- Although there might be rather intense maritime competition and resistance to attempts by China to coerce its neighbors, it is very difficult to imagine a contest for geopolitical stake akin to the competition for Europe at the heart of the Cold War.

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VII. ADVERSARIAL TRIPOLARITY



BMT Project Subtask on Thinking Through Alternative Security Environments

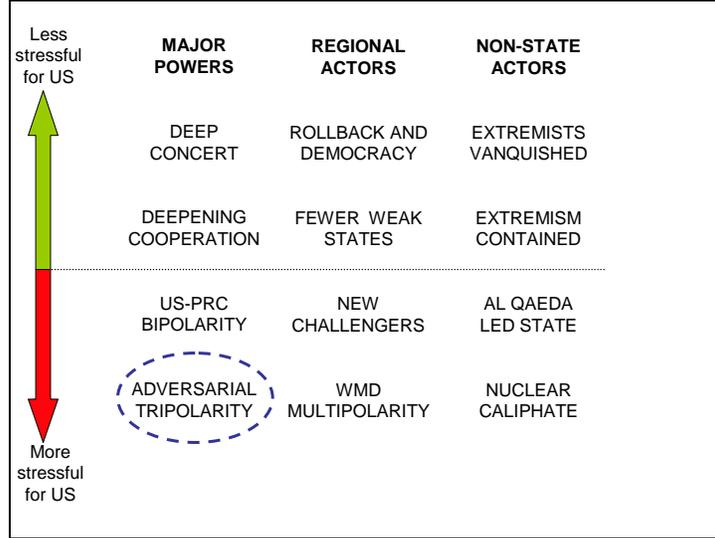
Adversarial Tripolarity

Brad Roberts

July 26, 2006

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What Are the Basic Characteristics?

Violent extremism: has not erupted into a significant new form.

Regions: not so unstable as to generate global concerns, little further proliferation.

Focus is on significant erosion of major power relations:

- Relations among PRC, RF, and US shaped increasingly by mutual grievance, disappointment, and strategic suspicion—and by need not to lose a tightening military competition.
- Russia and China increasingly hostile to US "projects" in their regions and beyond.
- A hardening of ideological division between American liberalism and proto-capitalist fascism.
- No other "rising powers" relevant in this time frame.

Getting to this future probably also requires 2 catalytic events:

1. A China-US war over Taiwan.
2. Negative regime change in Moscow leading to increased hostility toward both the US and China.

This Isn't a Return to the Cold War

Cold War is a tempting but misleading analogy.

Salient distinctions:

- No durable 2-party alignments against the 3rd.
- No “iron curtain” dividing sides.
 - Competitive tendencies would be dampened by experience of current decades.
 - But there would be no expectation of deeper economic integration or political cooperation.
- Conventional clashes not so rare as in Cold War.

What is the Primary Strategic Challenge to US?

- Efforts by China and/or Russia to contest US supremacy, whether at the conventional level in theater or at strategic level, including possibly in space.
- Efforts by one or both to project conventional power into regions of significant US interest so as to contest US influence and to keep world from acclimating to uncontested US hegemony.
- Efforts by one or both to assist their proxies to develop their asymmetric counters to US power projection, including survivable WMD and BMD penetration aids.

What Particular Military Problems Might the US Confront?

1. Direct conflict with Russia or China, likely to involve limited wars for limited ends but with a potential for further escalation.
2. Conflict between Russia and China (and their concerns US might act as spoiler).
3. Conflict with proxies of Russia or China, whether regional actors or violent extremists.
4. Unexpected flashpoints—this is a global landscape.
5. Their sudden breakthroughs with new disruptive technologies or operational modes (e.g., space attack).

What Strategic Response Would the US Want to Muster?

1. US would want to compete with developments in RF and PRC strategic postures in a way that preserves an effective US deterrent posture.
2. US would want to resist their attempted coercions of the US and its allies and partners.
3. US would want to deter, defeat and, where useful and practical, punish acts of aggression by other major powers or their proxies.
4. US would want to reinforce nonproliferation and induce some RF and PRC restraint in this regard.
5. US would want to dissuade other potentially rising powers from competing militarily with the US.
 - Whether Russia and China could be dissuaded from future competitions might be much debated.

What General Military Posture Would Best Support US Objectives?

High value attributes:

- Conventional power projection to the zones of competition.
- Extended deterrence to and assurance of allies.
- Capable against advanced asymmetric counters to US power (e.g., CBW, space, cyber).
- Escalation control for "limited wars under the nuclear shadow."
- Technologically competitive with the developing capabilities of adversaries enjoying productive capitalist economies with both industrial and post-industrial elements.

Lower value attributes:

- Flexibility for non-peer contingencies.

What Would the US Seek From Each Element of the New Triad?

Infrastructure:

- Largely tailored to ongoing competition.

Defenses:

- Theater missile defenses would be essential to assurance and also as foundation for crisis projection of additional capabilities.
- CONUS missile protection would be of high value. Indeed, US may prefer defense dominance but find it not viable in this timeframe.
- Passive CBW defenses in theater would be more important than ever.

ISR:

- An "unblinking eye" over both Russia and China.
- But this would likely prove beyond US means in this timeframe, though US would take steps to try to create it.

Strike:

- Not (just) for Armageddon but usable for decisive benefit in conflicts with their proxies or directly involving them but for "limited ends under the nuclear shadow."

For Strategic Strike, What Objectives?

To play to US strengths at the conventional level of war and in the non-nuclear aspects of the New Triad—to the extent possible.

To win wars on US terms, by achieving US objectives with the lowest possible damage.

To "control" RF and PRC escalation.

- To inhibit their precipitation of a political-military crisis.
- To restrain their use of nuclear weapons generally in local conflicts, especially those involving the US.
- To restrain their efforts to deter the US from counter-escalating.
- To undermine their temptation use nuclear weapons for war termination in a massive, punitive act of nuclear retaliation.

Toward this end, US strike capability to effectively:

- Destroy their conventional power projection assets.
- Cripple their tools for managing escalation (C4ISR, strike platforms, strike bases).
- Inflict commensurate retaliation.

What Would be the Targeting Problem?

Potential military targets would number in the thousands.

- But in "limited wars for limited ends under the nuclear shadow," the number that the US might actually strike would likely be far smaller.
- Roughly speaking, the number would be a function of the need to retaliate for their strikes on US military targets.

Most important C2 centers are HDBT—robustly so. Other leadership targets would be many (especially in China) and well protected.

Critical variable: vulnerability of their retaliatory forces to US preemption.

- For Russia in this timeframe, such vulnerability is very unlikely. Plus, US is not likely to have high confidence that it knows all WMD production, storage, or deployment sites.
- For China, that vulnerability would be a great strategic prize.
 - US would be committed to preserving that vulnerability.
 - China would be taking steps to eliminate it.
 - Key US debate: whether the US could achieve a New Triad posture capable of preemptively "thinning" PRC forces to the point that their threatened penetration of the US missile defense shield is not credible.

What Would the US Seek from the Different Elements of Strategic Strike?

Kinetic:

- Nuclear vs. non-nuclear:
 - Against nuclear adversaries, US would want to not make 1st use of nuclear weapons so as not to legitimize their nuclear use, and thus would rely heavily on conventional strike for defeating their power projection and controlling escalation.
 - But US would want credible nuclear options.

Non-kinetic:

- Cyber would be very prominent in the RF and PRC tool kits and US should be prepared both to defeat their efforts and wage its own.
- SOF could play a significant role in disabling a few high priority targets that could otherwise be crippled only by nuclear means.

For the Nuclear Force, What Characteristics Would Be Desirable?

Credible for the high end of the conflict spectrum.

Usable in small numbers for tailored effects.

Effective against "reachable" HDBT. But this may not be a high priority in wars US desires to keep limited.

Quickly alertable: capable of rapid responses to sudden flashpoints.

With sufficient "genetic diversity" to enable high confidence sustainment without very large numbers of replacement weapons.

For the Nuclear Force, What Force Posture Would Be Suitable?

Alert posture:

- Capable of surviving both preemption and mop-up.
- Capable of sustained limited operations against an adversary unwilling to escalate or quit.

Baseline posture:

- Sized and scoped to counter adversary escalation options.

Key issue: would a renewal of US tactical and/or theater nuclear systems in Eurasia seem necessary as a way to match the build-up of comparable Russian and Chinese systems?

- How would US meet the demands and sensitivities of extended deterrence in this scenario?

What Strategy and Policy Context Would Best Serve US Interests?

In the a-d-d-d construct, the emphasis in this future would fall on deterrence. "Defeat" at strategic level could be a US wish but Russia and China could be expected to "race" to foreclose that option.

Dissuasion could be seen as a lost cause vis-à-vis Russia and China but might be seen as relevant vis-à-vis other rising powers.

Assurance would be a priority but not the top one:

- Of US allies: US would again face problem of allies concerned that too competitive a US response to major powers would intensify instability.
- Of US public: that the US has the power to match two rising challengers.

On deterrence:

- Focus on deterring RF and PRC aggression and escalation.
- US would want to persuade Moscow and Beijing of its will and ability to use nuclear weapons in numbers small and large in the circumstances they might create.
- US would want to keep nuclear threshold high so as not to legitimize adversary use of nuclear weapons.
- Extended deterrence would generate intense renewed interest in this scenario.

What Would Threat Reduction Encompass?

Vis-à-vis major power:

In wartime: US should expect advanced asymmetric counters to its conventional capabilities and should be ready for them.

In peacetime: Strategic stability would likely again emerge as a major policy focus. Variations on a familiar theme:

- With 3 rather than 2, more difficult to understand and model.
- Special problem for RF and PRC: how to dissuade US from pursuing regime removal strategies.
- Unpredictability could generate proliferation incentives among US allies.
- This raises a question about the potential contribution of arms control. Possible function: to "manage" a tripolar offense/defense competition in a way that lends "predictability" to others or to somehow formalize elements of restraint by all 3?

Vis-à-vis the regions:

In wartime: Proxies would likely be well armed with asymmetric counters.

In peacetime: Nonproliferation remains viable in this future environment, although on a limited basis, and the US would want to utilize these norms to constrain RF and PRC assistance to proliferators.

Would This World Seem More Certain?

Yes. Peer adversarial competition would seem familiar and would be expected to be long term.

But this world would also seem very unstable, given inherent complexity of tripolar arms race and crisis instability, especially if and as the US strives for defense dominance.

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VIII. FALLEN NUCLEAR DOMINOES



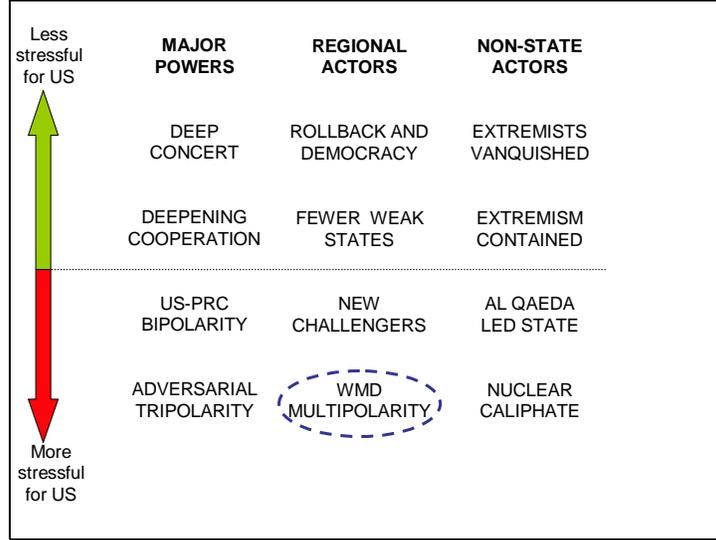
BMT Project Subtask on Thinking Through Alternative Security Environments

Fallen Nuclear Dominoes

Brad Roberts
September 24, 2007

Key Questions

1. What are the basic characteristics of this particular security environment?
2. What is the primary strategic challenge to the US?
3. What particular military problems might the US confront?
4. What strategic response would the US want to muster?
5. What general military posture would best support US objectives?
6. What would the US seek from each of the elements of the New Triad?
7. For strategic strike, what broad objectives would guide US planning?
8. What would be the targeting problem?
9. What would the US seek from the different elements of strategic strike?
10. For the nuclear force, what characteristics would be desirable?
11. What nuclear force posture would be suitable?
12. What strategy and policy context would best serve US interests?
13. What would threat reduction encompass in this environment?
14. Would this environment seem more certain?



What Are the Basic Characteristics?

Regions:

- No rollback of DPRK or Pakistan or India.
- Iran becomes an avowed weapon state.
- Many of its neighbors accelerate weapons programs.
- In Northeast Asia, Japan and/or ROK opt for nuclear forces of their own.
- In Latin America, Venezuela and some new challenger proceed and the ambitions of some prior nuclear-interested states are re-ignited.
- Some proliferators are challenges to US-backed order, while others want continued partnership but also greater autonomy.

Violent extremism: Radical Islamists continue attacks on Near and Far enemies but have not gained control of a WMD-capable state.

Major powers: Relations not markedly worse but also not markedly better.

- Russia and China selectively support/enable proliferation.
- US seen by them as doing the same as its allies "go nuclear."
- Other "rising powers" are developing advanced latent nuclear capabilities as a form of hedging.

Key observation: this is not the worst of the worse-case.

- It's not a "WMD jungle" involving the most demanding strategic competition in all 3 of our key security environment variables.

What is the Primary Strategic Challenge to US?

Restraints on its freedom of maneuver to project power into regions of concern imposed by WMD-armed states, both minor and major.

Heightened sense of homeland vulnerability.

[These are the same as in the “losing ground” future, but would be magnified in intensity and clarity of threat.]

What Particular Military Problems Might the US Confront?

1. Newly nuclear-armed states seek to coerce and compel the US and its friends and allies.
2. Newly nuclear-armed states project power at the conventional military level, within or beyond a region, with the conviction that their threat of nuclear retaliation will safeguard their interests.
3. One, two, or multiple parties to a regional conflict employ nuclear weapons and external powers are called upon to terminate the conflict and perform stabilization and reconstruction missions but in a contaminated setting.
4. Regional non-nuclear states allied with or otherwise sympathetic to the US make new demands on it for externally provided security.

What Strategic Response Would the US Want to Muster?

1. US would want to project power against regional nuclear-armed powers.
2. US would want to contain and deter and where necessary and possible defeat WMD-armed rogues.
3. US would also want to cope with the associated "loose nukes" problems such crises would generate.
4. US would also want to extend deterrence to allies and partners in unstable regions/zones. It would also want to enable more partners to participate in their collective defense.
5. US would want to dissuade rising powers from choosing intense nuclear competition with the US.

What General Military Posture Would Best Support US Objectives?

- Tout d-azimuth deterrence.
- Increased emphasis on protection.
- Increased emphasis on power projection against WMD-armed challengers and the requirements of escalation dominance.
- Improved disruption of international nuclear trafficking, especially to terrorists.
- Hedging against and dissuasion of possible renewal of major power strategic competition for advantage.

What Would the US Seek From Each Element of the New Triad?

Infrastructure:

- Generating new capabilities tailored for new requirements but postured also for dissuasion of major power competition.

Defenses:

- High priority, scaled to out-pace developments in rogue missile forces but also postured to hedge against major powers.

ISR:

- Flexible and adaptive to a broad set of regional actors—not scaled for major powers.

Strike:

- Non-kinetic: cyber and SOF of potentially high utility against vulnerable rogue assets.
- Kinetic:
 - Non-nuclear: high value for US for purposes of deterrence and defeat.
 - Nuclear: for purposes of deterrence—and thus plausible for use for war termination, retaliation, and preemption. Need to deter many may increase reliance.

For Strategic Strike, What Objectives?

To fight wars by playing to US strengths at the conventional level.

To win wars on US terms, by achieving US objectives with the lowest possible collateral damage.

To deny minor powers any ability to escalate.

What Would be the Targeting Problem?

Leadership targets: potentially numerous with movement frequent and well rehearsed.

Military targets:

- Strategic military: potentially 20s or even low 100s, with WMD assets likely dispersed and hidden.
- Hardened: steadily growing in number and depth.
- Other: conventional power projection targets could be numerous.

What Would the US Seek from the Different Elements of Strategic Strike?

Kinetic:

- Nuclear vs. non-nuclear:
 - US leaders would have strong preference for non-nuclear means (non-nuclear strike in combination with BMD) to achieve all strategic effects.
 - Nuclear weapons would be held for purposes of threatened preemption and retaliation against WMD-willing rogues.

Non-kinetic:

- Cyber seems promising against regional powers.
- SOF could contribute significantly.

For the Nuclear Force, What Characteristics Would Be Desirable?

Capable of operating effectively at levels of escalation opened up by adversaries choosing to escalate.

Usable in small numbers for tailored effects in some conceivable circumstances.

Given the potential for use in small numbers, high value on surety.

For the Nuclear Force, What Force Posture Would Be Suitable?

Alert posture:

- Driven principally by force balances with major powers, not regional proliferators.

Baseline posture:

- Theater capabilities might seem of high value to US allies and friends.

What Strategy and Policy Context Would Best Serve US Interests?

In the a-d-d-d construct, emphasis would be on
deterrence:

- Of newly nuclear-armed states from miscalculating about the utility of nuclear weapons for purposes of coercion and military victory.
- Extended deterrence would seem more important where it remains viable, but the proliferation by states friendly with the US in this scenarios suggests that it does not remain broadly viable.

What Would Threat Reduction Encompass?

Vis-à-vis regions:

- Nonproliferation is not "dead" in this future, just badly weakened.
 - More emphasis on dealing with particular countries than on the nonproliferation regimes as such:
 - Assure allies and friends.
 - Restrain the next wave of proliferators.
 - Enlist Russia, China, "rising powers" as possible on ad hoc basis.

Vis-à-vis major powers:

- Priority on managing "arms race risks" in a way that they do not compromise the ability to prepare for regional WMD contingencies. Focus on stability, transparency.

Would this Environment Seem More Certain?

Probably.

- A tipping point would have been crossed and the consequences played out.
- If at the same time some or many states begin to develop nuclear energy sectors, the perception may grow that there is yet more proliferation to come.

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IX. NEW TRIAD CAPABILITIES VS. EXPANSIVE NUCLEAR CALIPHATE



New Triad Capabilities vs. Expansive Nuclear Caliphate

V. Utgoff

April 6, 2008

Objectives of Analysis

1. Assess size and nature of New Triad capabilities plausibly required for the ENC 2013-2022 security environment.
2. Describe potential competition between rogue's evolving nuclear forces and US's evolving New Triad.
3. Describe potential future relationship between conventional and nuclear global strike forces.

Key Aspects of Strategic Situation

- Al Qaeda group secures control of Arabia.
- Quickly arms modest Saudi missile force with covertly obtained nuclear weapons.
- With this presumed protection, pursues revolutionary remaking of state structures in Arab/Islamic world.
- *Aggressive, nuclear-armed, ideologically radical state controlling essential oil supplies poses fundamental challenge to world order.*

Prospective Strategic Responses

1. Quick intervention to overturn ENC --- But, unless strong New Triad capabilities were in place, intervention could be judged too risky.
2. Containment --- US and partners would hope containment can last long enough for ENC to accept status quo, or for opportunity to emerge for regime change at tolerable risk.

"Socialization" of a radical state can take decades...Soviet Union took ~ 6 decades. Iranian regime has not yet been socialized after nearly 3 decades.

Missions for Intervention

1. *Render successful ENC use of nuclear weapons unlikely*.*
2. Assemble/bring to bear in a timely manner US/coalition forces.
3. Quickly seal off ENC to block any exiting nuclear weapons.
4. Defeat ENC military forces and gain control of Arabia.
5. Remove surviving ENC leadership.
6. Find, destroy, or remove surviving nuclear weapons and other WMD.
7. Stabilize population and support emergence of a democratic government.
8. Reconstruct essential infrastructure.
9. Suppress potential security challenges emerging from others.

**This high standard may be required to gain necessary support for intervention.*

Required Effectiveness of Coalition's Counter- Nuclear Capabilities

- Rendering successful ENC use of nuclear weapons unlikely (less than 50% chance of even one hit) requires very effective New Triad.
 - If ENC has 7 weapons, goal can't be met if each weapon has at least a 10% chance of reaching its target.
 - If ENC has 20 weapons, goal can't be met if each has at least 3.5% chance of reaching its target.
- Missile and air defenses and border control capabilities must remain very effective until nuclear weapons sanitization is complete.
- *Lack of effective counter-nuclear capabilities could make containment seem a far less risky option than intervention.*

Fundamental Military-Political Goals of Containment

1. Create and maintain an effective Coalition to block ENC conventional/political/insurgency expansion.
2. Deter ENC use of nuclear forces, and avoid or counter its efforts to intimidate Coalition by threatening use.
3. Block ENC efforts to significantly improve its nuclear forces.
4. Improve Coalition's New Triad capabilities to minimize risks of intervention should that prove necessary.

Vigorous competition between ENC efforts to improve its nuclear capabilities and US/Coalition efforts to make them impotent seems certain.

Values to ENC of Alternative Levels of Nuclear Capabilities

1. First Operational Weapon – Capability to deliver one unopposed nuclear weapon to a target of high value to US or an ally --- *Signals adversary's emergence as a nuclear power with more to come*
2. Minimum Defensive Capability - Taking New Triad into account, capability to expect one weapon to survive to a high value target --- *Minimum to believe it won't be put in a position of nothing left to lose*
3. Minimum Offensive Capability - Above, plus enough in reserve to expect limited retaliation from US --- *Minimum to believe it could win a limited nuclear war for limited stakes*
4. Existential Threat - Above, plus enough to pose an existential threat to the US --- *Can have substantial confidence US would do its best to avoid war for limited interests*
5. Parity in Numbers - Above, plus numbers comparable to those deployed by US --- *Can expect to be widely seen as a nuclear peer.*
6. Numerical/Technical Superiority – Of limited additional value so long as US poses existential threats to all plausible enemies.

New Triad Capabilities for Suppressing ENC Nuclear Strike Capabilities

1. Missile/air defenses capable of supporting intervention at lowest possible risk
2. ISR to find and track critical targets
3. *Robust strike forces capable of achieving all necessary strategic effects*
4. Infrastructure capable of winning an extended nuclear capabilities competition by keeping the ENC below what it could see as a *minimum offensive nuclear capability*.

ENC Missile Forces/Facilities Targets

- Assumed initial configuration:
 - 2 missile bases in desert south of Riyadh – larger has 2/3 of assets.
 - 30 CSS-2 liquid-fuel missiles on 15 mobile launchers
 - 9 possible missile storage building in support areas
 - 90 “fortified” weapons storage buildings
 - 3 launch areas near bases, each containing a large earth-covered building and 2 underground missile storage buildings
 - 3/12 missiles on day-to-day/high alert in concealed positions spread over 2,500 km sq area
- Assumed improvement goals:
 - 120 solid-fuel missiles with improved performance on 60 launchers
 - 12/48 missiles on day-to-day/high alert in hidden positions over 750,000 km sq area

Assumed numbers and types of target were projected solely from open source descriptions of Saudi Arabia’s military forces, and its military and civil infrastructure.

Other Potential ENC Strategic Targets

- Other WMD-related targets:
 - 6 hardened underground NCA/C3 bunkers located in or near major cities
 - 4 main Air Force bases plus 1-2 smaller bases to guard missile bases
 - 12 hardened underground C3/possible nuclear weapons storage bunkers at above airbases
- Other military targets:
 - 5 large military cities for Army, plus base at Riyadh + 5 National Guard military cities and bases
 - 16 other military airbases
 - 2 main naval bases plus 8 smaller bases
 - Major ground forces units
 - 15 long-range surveillance radars
- Economy/standard-of-living targets:
 - Utilities infrastructure
 - Oil industry infrastructure
- Targets for deterrence of WMD strikes against civilians:
 - Government facilities within Riyadh, Jiddah, Mecca, Al Medina

Strike Capabilities Necessary for Specific Strategic Effects

1. Swift destruction of ENC NCA and related C3, nuclear/WMD weapons storage, and delivery systems --- *to protect US and others from WMD attacks*
2. Destruction of ENC military forces --- *to respond to WMD attacks against coalition military forces.*
3. Destruction of non-military targets with low civilian fatalities --- *to deter ENC terrorist and harassment attacks and burden its economy and standard of living*
4. Swift destruction of advancing ENC military forces not otherwise stoppable in a timely manner --- *to avoid an exceptionally costly setback*
5. Without substantial delay, at least commensurate retaliation against ENC targets in urban areas --- *to deter WMD attacks against coalition civilian populations.*

Overall capability should be sufficient to pose an existential threat to ENC without significantly reducing US capabilities against other adversaries.

Key Considerations for Planning Strike Capabilities

1. Provide robust conventional strike forces to maximize possibilities for "prudent risk" judgments not to use nuclear forces.
2. Provide robust nuclear forces for use when they can substantially increase likelihood of achieving essential strategic effects.
3. Target for reliable, quick destruction all ENC operational nuclear/WMD strike capabilities.
4. Minimize collateral damage consistent with importance of accomplishing mission.

Key Planning Goal: Near-perfect attack complete within 10-20 minutes of the first detection it is underway.

Assessing Weapons Requirements

- Drew on past experience and back-of-the envelop calculations of what kinds of effects are required to destroy/disable identified targets, e.g.,
 - Overpressure destruction and/or penetration by projectiles of missile/aircraft airframes
 - Penetration/displacement of earth/concrete/rock/runways
 - Blast effects on personnel and equipment within penetrated structures
 - Heat effects/enhanced radiation vs. CW/BW
- Identified from open sources whether effects are clearly achievable with currently available weapons.
- Weapons types not currently available identified in red.

EMP and directed energy weapons also have substantial promise but effects difficult to assess at unclassified level.

Conventional Targeting for Rapid Destruction of ENC Missile Forces

- Against assumed initial missile forces configuration:
 - 99 concrete/steel-penetrating precision guided (PG) munitions with ~100 kg HE vs. weapons/missile storage buildings in support areas.
 - 9 earth/concrete/steel-penetrating PG munitions with 250 kg HE vs. underground buildings in nearby launch areas
 - 12 munitions vs. maximum alert missiles in concealed locations
 - Unitary PG munitions with 100 kg HE, if target precisely located in soft cover
 - 1000 kg of 200 gram tungsten pellets/rods for shaped uniform hypersonic delivery vs. target in soft cover within 200 m of aim point
 - Concrete/steel-penetrating PG munitions with 250 kg HE, if target is located in shallow caves/reinforced concrete buildings
- Against expanded force configuration, 36 more munitions versus increased numbers of maximum alert missiles.

DOD does not appear to have deployed the munitions described in red on this and subsequent charts.

Conventional Targeting for Rapid Destruction of Aircraft Possibly Carrying Nuclear Weapons

- Against 4 main air bases, plus 2 smaller air bases – alternatives:
 - 12 PG missile-delivered munitions with 250 kg HE vs. hangars plus,
 - 300 PG missile-delivered munitions with 10 kg HE vs. individual shelters/revetments, or,
 - 36 ballistic missiles carrying 1000 kg of 200 gram pellets/rods for shaped uniform distribution to destroy individual unsheltered aircraft
- or:
 - 96 cruise/24 ballistic missiles carrying sub-munitions or PG 250 kg penetrating munitions to cut/destroy 4 runways/ taxiways each at 6 military airbases until air strikes can complete destruction of ENC aircraft.

Conventional Targeting for Rapid Destruction of Other WMD-Related Facilities and Capabilities

- Against 6 hardened shallow-medium depth command bunkers for NCA/C3 located in or near major cities – alternatives:
 - 6 conventional PG 2500 kg penetrating munitions delivered by ballistic missiles at hypersonic velocities, or,
 - 30 PG 500 kg hypersonic penetrating munitions vs. entrances, air vents, etc.
- Against 12 hardened shallow-medium depth C3/possible nuclear storage bunkers at above 6 airbases – targeting as above, but twice as many munitions

All other targets can be destroyed with available conventional weapons types though very large numbers can be required.

Nuclear Strike Capabilities vs. ENC WMD-Related Targets

- 6 PG earth-penetrating 1-5 KT weapons vs. hardened/buried command and nuclear weapons storage bunkers at missile bases + 6 more vs. hardened/buried NCA/C3 + 12 more vs. buried C3 or nuclear weapons storage bunkers at possible nuclear airbases
- 12/48 more accurately delivered earth-penetrating/airburst 1-5 KT vs. maximum alert missile launchers
- 6 accurately delivered 10 KT airburst weapons for destruction of aircraft and buildings at 6 main airbases

Conventional destruction of alert launchers should be possible if localized within 200 m in soft cover.

Nuclear Strike Capabilities vs. Other ENC Targets

- 16 accurately delivered 10 KT weapons airburst vs. aircraft and facilities at other airbases
- 8 more vs. facilities/ships at naval bases
- 10 more vs. facilities at military cities
- 4 30-100 KT airburst weapons vs. government/civil complexes in cities

Targeting Capabilities vs. ENC

Target type	Conventional targeting options	Nuclear targeting options
Nuclear weapons/missile storage, surface	100 of types available	---
Above, buried	10 of types available	6 PG/earth penetrating/1-5 KT
Alert nuclear missiles located/soft cover	12-48 of types available	---
Above, located within 200m	12-48 1000 kg/PSD/HYV Pellets	12-48 accurately delivered airburst/1-5 KT
Above, located within 2000m	---	12-48 accurately delivered airburst 1-5 KT
Above, located in caves/concrete bldg.	12-48 of types available	12-48 PG/penetrating/1-5 KT
Hard NCA/C3 bunkers, buried	6-30 PG/earth penetrating HYV	6 PG/earth penetrating/1-5 KT
Combat a/c, in hangars	12 of types available	6 airburst 10 KT
Combat a/c in shelters/revetments	300 of types available	Covered above
Runways/taxiways	96 CM24 BM/munitions/ HYV penetrate	Covered above
Hard C2/nucwps bunkers, buried	12 avail. or 12 PG/earth penetrating HYV	12 PG/earth penetrating/1-5 KT
Military cities, airbases, naval bases	1330 of types available	34 airburst 10 KT
Army/NG/Militia in shelters	960 of types available	---
Standard of living/oil infrastructure	100 of types available	---
Govt./civil bldg in 4 large urban areas	8000 of types available	4 airburst 30-100 KT

Overall Conventional and Nuclear Strike Requirements for ENC

- Conventional:
 - 10,960 total weapons*
 - 626 for counter-nuclear
 - 3 new types
 - Precision-guided, earth-penetrating, hypersonic vs. hard, buried shelters
 - Precision-guided, earth-penetrating, hypersonic vs. runways
 - Precision-guided and shaped patterns of hypersonic rods vs. missiles, aircraft
- Nuclear:
 - 110 total weapons
 - 72 for counter-nuclear
 - 2 new types
 - 48-120 precision-guided 1-5 KT weapons
 - at least 24 should be earth-penetrating

*A bomber from US might deliver 50 weapons every 48-60 hours; a tactical fighter from 800 miles might average 8 weapons every 18-24 hours; a ballistic missile from 2000 miles might deliver 1-4 weapons in 7-10 minutes.

Possible Counter-Nuclear Uses of Conventional D-5 vs. ENC

1. 100 hard nuclear weapons/missile storage, surface targets (2 D-5)
2. 10 hard nuclear weapons/missile storage, buried (2 D-5)
3. 12-48 alert nuclear missiles launchers located within 200 m in soft cover – (12 - 48 D-5)
4. 6 hard NCA/C3 bunkers, buried (6 D-5)
5. 6 airbases with max of 100 a/c each in shelters/revetments – (6 D-5)
6. 12 C3/nuclear weapons storage bunkers, buried (12 D-5)

40-76 D-5 missiles total implies 5-10 per SSBN at maximum alert rate of 66% and within range of targets.

Other Requirements for ENC Containment and Potential Intervention

- Many requirements beyond capability to deter, destroy and defeat as addressed above.
- Other requirements include:
 - Infrastructure
 - Defenses
 - C4ISR
 - Assurance of allies/extended nuclear deterrence

Infrastructure

- Infrastructure must support a broad range of requirements over an indefinite period, especially:
 1. R&D and production of an evolving variety of conventional and nuclear strike weapons.
 2. Development and production of specialized sensor systems to:
 - a) Detect and track nuclear weapons systems
 - b) Determine nature of activities in buried facilities
 - c) Assess effectiveness of attacks
 - d) Support interdiction of smuggled nuclear weapons, materials, and associated equipment

Defenses

- US/Coalition partners need strong active and passive defenses against nuclear weapons and other WMD that is deliverable to coalition targets by missiles, aircraft, or by smuggling.
 1. Pursue cooperative programs to develop and produce the evolving defenses needed within the theater.
 2. Accelerate R&D and limited production to provide an improving suite of defenses for the US homeland.
 3. *Suppress/Interdict ENC efforts to expand or improve their nuclear weapons and other WMD attack capabilities.*

C4ISR

- Establish a high-speed netted C4 system linking US and coalition partners.
- Establish comprehensive, persistent, real-time, high-resolution multi-spectral SR over entire ENC, its approaches, and any external operating areas.
- Pursue the many intelligence requirements that would be key to maintaining the strongest possible counter-WMD capabilities.

A Sampler of Key Counter-WMD Intelligence Questions

1. Numbers, design features, storage locations of nuclear weapons and missile systems?
2. Nature of penetration aids and CCD measures for missile systems?
3. Capabilities to deliver nuclear weapons with systems other than ballistic missiles?
4. Activities and signals that would be associated with preparations to alert or use nuclear strike capabilities?
5. Capabilities for quick-reaction launch of WMD delivery systems?
6. Numbers, locations, design features of NCA shelters?
7. Vulnerabilities of WMD-related targets to EM/nuclear radiation, other effects?
8. Nature of adversary's nuclear strategy?

Extended Deterrence for Assurance

- Possible arrangements include:
 - A Coalition Nuclear Planning Group that meets regularly
 - Weapons containing all necessary components for safe and reliable use limited to the specified mission.
 - Modest numbers of pilots from front-line states trained and ready for missions perhaps from safer "rear-area" bases
 - Weapons moved forward to coalition aircraft only when circumstances require

Observations and Conclusions

1. While many strategic questions would have to be considered before preempting against any adversary, this analysis does highlight the value of having effective New Triad ready before a highly aggressive adversary obtains nuclear weapons. Quick and effective conventional preemption would avoid a long and uncertain containment effort.
2. Note that concentrating large forces close-in would be dangerous before suppressing ENC nuclear forces, but delaying their arrival could allow WMD to escape.

Observations and Conclusions

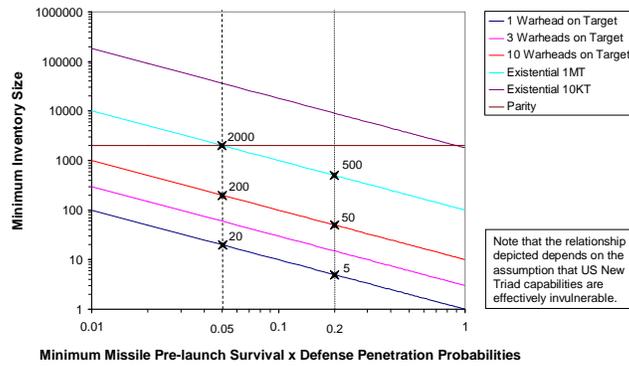
3. Parallel inventories of improved types of nuclear and conventional weapons should be created for nearly all relevant target types.
 - Conventional weapons vastly more likely to be used but nuclear weapons seem the more powerful source of deterrence.
 - Nuclear weapons could more reliably destroy the most challenging targets.
 - Which to use would depend first on political factors and "third" on their expected effectiveness in the circumstances at hand.

Observations and Conclusions

4. Preemption can require large numbers of precision-delivered weapons to arrive on target nearly simultaneously. Missiles or aircraft carrying large numbers of compact, drop/disperse and forget, precision guided munitions would be a big advantage.
5. Even carrying large numbers of munitions per missile, very large numbers of ballistic missiles can be needed for an effective preemptive counter-WMD attack.

Backup Slides

Prospective "Strategic" Forces Competition Between ENC and US/Coalition



Forward-Deployed Forces to Contain and Suppress ENC

- SOF, tactical air, intelligence contingents to counter insurgencies (initially in Jordan, Iraq, Kuwait, Bahrain, Qatar, United Arab Emirates, Oman, Yemen, Egypt)
- Naval forces to protect PG/Red Sea oil movements, to provide air and missile strikes in support of allies and land-based supporting forces, and to deter/respond to ENC military forces.
- Sea-based ground forces to assist land-based contingents as needed

What roles would US want other Coalition members to play? What forces and resources should they provide?

Assurance Requirements for Containment

1. Containment requires strong support to front-line governments:
 - a) Low-visibility assistance for counter-insurgency campaigns...technical, intelligence, advanced weapons, strategy, operations, tactics, training
 - b) Assistance with missile and aircraft defenses and other homeland defense/security preparations
 - c) Assistance in protecting oilfields, production and transportation infrastructure, tankers
2. Preventing nuclear proliferation by states at risk could also require *credible arrangements for extended nuclear deterrence*.

Extended Deterrence Arrangements for Assurance

1. NATO-style arrangements could look too risky in states with active insurgencies.
2. All Coalition members should play some responsible regular role in planning the nuclear capabilities and contingency operations that would be needed for deterrence, and in executing nuclear operations should that prove necessary.
3. *Other nuclear-armed Coalition members could conceivably be co-providers of extended deterrence.*