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A Goal-Driven Approach to Defining Key Principles for Measuring the
Adequacy of U.S. Strategic Forces**

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How Much is Enough?: A Goal-Driven Approach to Defining Key Principles for Measuring the Adequacy of U.S. Strategic Forces¹

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Introduction: Calculating “How Much is Enough” for Deterrence

Inherited from the Cold War is unwarranted confidence in a particular approach to identifying deterrence requirements and, with that, U.S. strategic force requirements in general, based on the number of survivable offensive forces deemed adequate to threaten designated enemy targets. This formula focuses on the number of survivable weapons necessary to threaten a select set of enemy targets, whether urban/industrial, military forces, political centers, or other physical assets. A focus on fewer, soft, unprotected targets—such as urban/industrial—can equate to the requirement for relatively fewer nuclear weapons for deterrence than does a focus on more numerous, hardened and protected targets—such as military targets. In either case, the logic and formula are clear: Possessing the number of forces necessary to threaten the selected targets essentially is equated to have a credible, reliable deterrent.

Secretary of Defense Robert McNamara was explicit in his use of this formula throughout the 1960s to identify U.S. strategic force requirements, but it continued to be reflected in official assessments of strategic requirements well into the 1980s,² and continues to dominate unofficial commentary to this day. An entire generation of U.S. officials and commentators was schooled in this methodology. Continued faith in this Cold War deterrence formula provides the basis for most contemporary public claims that the force requirements needed to provide nuclear deterrence can be identified with relative precision and confidence.

This familiar Cold War methodology is comforting and convenient. It appears to allow the otherwise very challenging question of “how much is enough” for deterrence to be answered with apparent mathematical precision. For example:

No sane adversary would believe that any political or military advantage would be worth a significant risk of the destruction of his own society. As noted earlier, the delivery of one hundred U.S. warheads would be sufficient to destroy the society and economy of Russia or China, and as few as ten detonations could kill more people than have ever been killed in any country in any previous war. *Thus ten to one hundred survivable warheads should be more than enough to deter any*

rational leader from ordering an attack on the cities of the United States or its allies.³

Other commentators may suggest larger numbers, but they still link confidence in the functioning of deterrence to the number of weapons:

The appropriate mission for U.S. nuclear weapons is deterrence. And the U.S. arsenal of more than 5,000 nuclear weapons has the capacity to deter any threat regardless of how many resources Russia, China, and/or any other country devote to modernizing their arsenals.⁴

There is nothing objectionable per se to the notion that deterrence planning includes identifying U.S. military threats to enemy assets, and using the related number of U.S. offensive nuclear weapons to help guide the U.S. acquisition requirements for strategic forces. The problem with confidence in this simple Cold War formula, however, is that it presumes a known reliable, predictable linkage between a specific number of U.S. nuclear weapons and the desired deterrent effect, and on that basis leads to confidence that deterrence will work predictably with some designated number of weapons. In truth, the formula provides no basis for such confidence. In addition, the number of nuclear weapons so identified as adequate for deterrence typically also is presented as the standard for the U.S. nuclear arsenal in general—as if deterrence is the only pertinent goal. It is not.

Using this simplistic formula to define deterrence requirements and U.S. strategic force requirements in general is popular sport in the United States. It is, nevertheless, a flawed and even dangerous approach to answering the question, “how much is enough?” There are too many uncertainties in the functioning of deterrence for confidence in claims that any particular number or types of strategic forces will deter predictably. Answering the question “how much is enough,” even when done with rigor, involves speculation and a myriad of unavoidable uncertainties. There are, for example, uncertainties involved in the technical estimates of weapon effects and target vulnerabilities. More important, however, is that informed estimates about the deterrent effect of U.S. forces must include assessments of opponent decision-making processes, values, intentions, histories, levels of determination, goals, stakes and worldviews, and the possibilities for reliable communication across a broad spectrum of current and future opponents. Are the opponents in question susceptible to U.S. deterrence threats? If so, are punitive threats to urban/industrial or some other types of targets useful for deterrence? To

whom must threats be communicated, and how? How might the credibility of U.S. threats be established with any confidence? And, how might we understand the level of credibility enemies attribute to our threats?

These types of questions are not minor details with regard to predictions about the functioning of deterrence and related assertions about deterrence requirements. A serious effort to identify those requirements must involve a multidisciplinary examination of such questions with full recognition of the great variation in answers possible across opponents, time, and context. It also requires access to special and occasionally highly-classified information. Even the most comprehensive analytic efforts cannot avoid speculation on key variables, and as is discussed below, the contemporary threat environment magnifies the uncertainties.

What Is New and Different, and What Difference Does It Make?

Specific expectations about opponent decision making and behavior are embedded in the Cold War's target-based formula for deterrence. Those expectations foster confident predictions about how opponents will think and behave, and thus how deterrence will function. On this basis, the formula points to the requirements deemed necessary for deterrence. Some of these expectations about the opponent and context may have been reasonable in the unique conditions of the Cold War, but they are questionable or simply erroneous in the contemporary geopolitical context. Some of the pertinent changes from the Cold War strategic environment to the present that must move our considerations of deterrence requirements in new directions are explored briefly below.

Detection, Attribution and Accountability

The conditions of the Cold War facilitated the expectation that the United States would recognize if an attack had occurred, by whom, and with what. Armed with such knowledge, the United States could identify the likely opponent in advance and bring to bear its specified retaliatory deterrence threat. However, if an attack cannot be recognized as such—or the attacker remains a mystery—then punitive retaliatory threats can have little specific direction.

In the contemporary environment there may be little basis for confidence in the attribution of attack, particularly with regard to biological weapons (BW) threats and limited nuclear threats.⁵ It may even be difficult in practice to distinguish between an opponent's employment of a biological agent and a naturally-occurring health disaster.⁶ How and against whom would U.S. leaders communicate threats to deter an attack that may not be recognized as such, or be traceable to its source? Generic U.S. deterrence threats issued to all who will listen, of course, are possible. But in such cases, confidence in the old target-based formula to identify "how much is enough" for deterrence will be unwarranted.

New Opponents and Unprecedented Threats to Be Deterred

During the Cold War the United States pursued efforts to define "stable" deterrence requirements and to "lock in" via arms control a "stable" balance of terror that met those requirements. Doing so seemed reasonable under Cold War circumstances because enduring features of the threat environment meant that enduring value was expected to be found in a relatively set formula for defining a "stable" balance of terror and the related strategic force requirements.

The contemporary threat environment, however, is far more dynamic than that of the Cold War; it may be more analogous to other historical periods in which the parameters of threat changed quickly.⁷ The continuity and centrality of the Soviet threat has been replaced by a kaleidoscope of opponents, threats and potential threats. U.S. deterrence goals and priorities correspondingly have become more varied both in the target audiences and the scope of actions to be deterred. The increasingly broad spectrum of opponents in the contemporary era offers more openings for misunderstanding, misperception, ignorance, extreme motivations, distorted communications, highly divergent values and the lack of mutual familiarity to prevent the reliable functioning of deterrence. A factor contributing to the contemporary uncertainty about the functioning of deterrence is the need to know *so much about so many diverse and largely unfamiliar opponents, e.g., the goals, values and decision-making processes of "rogue" states and terrorist organizations.*

In such a dynamic geopolitical environment no possible formula can define the set of U.S. forces to be "locked in" as adequate for deterrence. There is no easily-calculable metric to

define deterrence requirements because such assessments must now include a wide spectrum of opponents, contingencies and possible stakes/goals, all of which may shift as new threats emerge and old threats decline or re-emerge. Informed strategies for deterrence must vary according to the opponent and context, as must the corresponding necessary types of threats and supporting forces. The force levels that might constitute an “adequate” basis for meeting U.S. deterrence goals will depend on these details of the engagement, including opponents’ values, vulnerabilities, risk tolerances, perceptions, access to information, and attention. What may reasonably now be said with confidence is that U.S. deterrence threats, and supporting strategic forces intended to provide the desired deterrent effect will change and vary depending on the particulars of audience and context.

Implications for Measuring the Adequacy of U.S. Strategic Forces for Deterrence

Deterrence strategies and strategic force standards in the contemporary, fluid environment demand flexibility in application, humility in prediction and preparation for deterrence failure or irrelevance. The diversity of opponents, circumstances and threats suggests that a contemporary deterrence priority is for a spectrum of U.S. force options and flexibility in planning along with the traditional requirements for sufficient force quantity, lethality and survivability to threaten the array of targets deemed important for deterrence. The threats to be deterred will shift as will opponents’ susceptibility to deterrence strategies; this dynamism in the threat environment points to the value of differing approaches to deterrence and a spectrum of U.S. capabilities to support deterrence. A wide spectrum of capabilities and flexibility for change may better enable us to adapt deterrence strategies to this variability of opponents, threat conditions and stakes.

“How Much Do You Know?” Must Precede the Question “How Much Is Enough?”

When diverse and unfamiliar opponents present numerous uncertainties, seeking to understand the how’s and why’s of their unique decision making should be the first priority of a deterrence strategy. Information of importance for deterrence purposes includes understanding an opponent’s “mind-set and behavioral style,” and anticipating how that unique mind-set and

behavioral style will affect the opponent's response to U.S. deterrence threats. The absence of an investigation into such matters "...can result in the disintegration of even the best deterrence strategy."⁸

The scope for this necessary investigation is wide-ranging—from the opponent's formal authority structure and processes to the cultural norms that affect decision making. For example, some states and terrorist organizations properly categorized as having "high-intensity aggressive ideologies" can have "propensities toward martyrdom and apocalyptic visions... with no risk being too high if top decisionmakers prefer self-destruction to nonrealization of their vision."⁹ Now, gaining insight into such possible opponent characteristics must inform any serious attempt to understand how to deter them and the requirements for doing so.

What Role for Nuclear Weapons in Deterrence?

Confident *a priori* assertions that nuclear threats *are sure to make a decisive difference* for deterrence on every occasion, or that they *provide no significant added value* betray unwarranted certainty regarding how opponents will calculate and behave in the future. Even with a careful assessment of the pertinent details of opponent and context, precise prediction about the linkage of threat to deterrent effect is subject to uncertainties.

Some general inferences may be made in this regard. For example, a quick review of available evidence points toward the possibly unique value of nuclear weapons for deterrence in some cases. For example, during the 1991 Gulf War the Iraqi leadership *believed* that the United States would respond to Iraqi WMD use with nuclear weapons—and that expectation appears to have deterred. The 1991 Gulf War appears to offer empirical evidence that *nuclear* deterrence, at least on occasion, can be uniquely effective. Additional evidence may be found in the specific acknowledgement by former Indian Army Chief, Gen. Shankar Roychowdhury: "Do nuclear weapons deter? Of course they do. Pakistan's nuclear weapons deterred India from attacking that country after the Mumbai strikes."¹⁰ As this and other cases suggests, there is little doubt that *on some occasions* it has been "the reality of nuclear deterrence" that has had the desired "restraining effect."¹¹ In the future, as in the past, the working of deterrence on such occasions may be extremely important.

In addition, nuclear weapons may be necessary to threaten those assets opponents have demonstrated to be of highest value. Adversaries unsurprisingly seek to protect what they value. And, as Defense Secretary Harold Brown emphasized, U.S. deterrence threats in general should be capable of holding at risk those assets valued by the opponent.¹² This may be particularly pertinent to contemporary U.S. deterrence goals because rogues and other potential opponents are expending considerable effort on hard and deeply buried bunkers, and some of these bunkers reportedly can be held at risk of destruction *only via nuclear weapons*.¹³

For deterrence to “work” on those occasions when *nuclear* deterrence *is uniquely decisive* in the challenger’s decision making—whether those occasions are few or many—could be of great importance given the potential lethality of emerging WMD threats to the United States. To assert otherwise—that U.S. nuclear weapons now provide *no* unique added value for deterrence—contradicts available evidence and lays claim to foreknowledge about opponent decision making that cannot exist. Given literally decades of experience, the burden of proof lies with those who now contend that nuclear weapons are unnecessary for deterrence.

The probability of deterrence failure because of the absence of a U.S. nuclear threat cannot be calculated *a priori* with precision for any particular case. It may be non-existent or high depending on the specific circumstances of the contingency. Even if the risk of deterrence failure for this reason is low, however, the possibility would still deserve serious consideration because the consequences of a single failure to deter WMD attack could be measured in thousands to millions of U.S. and allied casualties. And, of course, in some cases the risk of deterrence failure in the absence of credible U.S. nuclear capabilities may be high.

In addition, in the contemporary environment when the stakes at risk for the United States in a regional crisis do not include national survival, and when post-conflict reconstruction and minimization of damage to civilians and neighboring states may be priority goals, the credibility of the U.S. deterrent may rest *not on how much damage can be threatened* à la the Cold War’s “assured destruction” standard, but rather on *how controlled is that threatened damage*. Low-yield and accurate nuclear weapons may contribute to a U.S. deterrent threat that is *more believable* than otherwise would be the case. The U.S. “legacy” Cold War nuclear arsenal’s generally high yields and limited precision could threaten to inflict so many innocent casualties that some opponents eager to find a rationale for military action may seize on the possibility that a U.S. president would not execute an expressed nuclear deterrent threat. An

opponent's doubts regarding the U.S. threat in such cases would work *against* the desired deterrent effect. This possibility points toward the potential value of both advanced non-nuclear and highly discriminate nuclear threat options for deterrence credibility. Some studies done late in the Cold War and looking 20 years into the future pointed to the same conclusion.¹⁴

There can be no promises that nuclear weapons, including more “discriminate” nuclear capabilities will make the difference between deterrence working or failing on any given occasion. An opponent could miss such fine points regarding U.S. nuclear capabilities, or be so motivated that the specific character of the U.S. nuclear threat is irrelevant to its decision making. What can be said, however, is that no existing study of even series of studies that offers the type of detailed, comprehensive analysis necessary to suggest that nuclear weapons can *be dismissed as unnecessary* for deterrence purposes. Indeed, such a study is well beyond the art of the possible.

Implications for U.S. Nuclear Force Sizing for Deterrence

This discussion suggests that U.S. nuclear capabilities, including those with accuracy and low yields, *may* contribute uniquely to U.S. deterrence goals. It does not attempt to identify “the” number of nuclear weapons adequate to ensure deterrence around which the United States can plan for the mid- or long-term. As noted above, to do so would be to lay a false claim to knowledge of a specific linkage between opponents’ decision-making and some specific number of U.S. nuclear weapons. More useful than such pretense are the conclusions that:

- U.S. force requirements for deterrence cannot be considered fixed—they are as subject to change as is the threat environment itself;
- there is no number of nuclear weapons that can be linked predictably to the functioning of deterrence;
- priority measures of merit for U.S. strategic forces now include sufficient force quantity, lethality, survivability and flexibility to threaten the wide array of targets potentially important for deterrence; and,
- U.S. deterrence planning and strategies should have the flexibility and adaptability necessary to adjust to a rapidly changing and surprising threat environment and their own failure.

Any honest effort to answer the more specific question “how much is enough” must follow a broad, multidisciplinary net assessment across multiple opponents, deterrence goals and

possible contingencies, and recognize the many uncertainties and limitations involved. Even informed analyses can capture only a “snapshot” in time and require constant review and likely revision to remain pertinent.

Finally, whatever level of U.S. strategic capability may be judged useful for deterrence at a given point in time cannot be the standard of adequacy for U.S. strategic forces in general because those forces must serve additional goals beyond deterrence. This last point is a particularly significant departure from Cold War practice when deterrence was the priority among priorities and was the declared basis for formulating strategic force requirements. *When U.S. strategic forces must serve additional priority goals that may entail different force requirements, conclusions about deterrence requirements can tell us only part of the story about overall U.S. strategic force requirements.*

The Adequacy of U.S. Strategic Forces to Meet Multiple National Goals:

Contemporary Strategic Force Goals and Metrics Beyond Deterrence

In the Twenty-First Century deterrence remains an important national goal, but on occasion additional national goals may be equally or even more important and U.S. strategic forces will support these additional goals. Consequently, the sizing and measures of merit for U.S. strategic forces must be informed by the requirements that follow from multiple national goals. The three goals beyond deterrence discussed below are not new; the prioritization of these goals in relation to deterrence and each other has shifted over time and place, but they have been included as U.S. national security goals by Democratic and Republican administrations for decades.¹⁵

1. Damage Limitation

In the contemporary environment of multiple sources of WMD threat, including limited WMD threats from rogue states and terrorist organizations, the functioning of deterrence is important but uncertain. If and when it fails, the immediate U.S. priority will be the limitation of casualties and damage to the extent possible. The value of strategic forces to support damage limitation directly should now be included in the definition of adequacy and measures of merit

for U.S. strategic capabilities. This value was anticipated by the Johnson Administration as early as 1964.¹⁶

The findings from recent studies of limited nuclear attacks against U.S. cities are not surprising—the United States presently is ill-prepared for even a “small” nuclear attack.¹⁷ However, there are numerous practical steps that can be taken to reduce the level of societal vulnerability to limited nuclear attacks.¹⁸ As the author of one recent study concludes, “There actually is quite a bit that we can do [to save lives]. In certain areas, it may be possible to turn the death rate from 90 percent in some burn populations to probably 20 or 30 percent—and those are very big differences—simply by being prepared well in advance.”¹⁹

In this contemporary context, imperfect damage-limitation measures may be the only means of societal protection in the event deterrence fails. In such an instance, they will likely be judged worth the effort whatever the ratio of their cost to the opponent’s offensive capabilities. When the prospective lethality of threat is high, the reliable functioning of deterrence is questionable, and damage-limitation measures can provide appreciable protection, *including the goal of damage limitation* as a determinant of U.S. strategic force adequacy is the *only* prudent approach. The Johnson Administration identified precisely the same logic and defensive objective in the 1960s. A number of plausible biological and nuclear contingencies now fit this genre of threat, which is why various forms of damage limitation against mass destruction attacks now are potentially so important.

Civil defense measures may now be essential to contemporary U.S. damage-limitation goals. There is no recent precedent of serious U.S. support for civil defense programs but, during the Cold War, Secretary McNamara identified civil defense as the single-most cost-effective approach to societal damage limitation.²⁰ In the contemporary environment, civil defense preparations against limited nuclear and biological attacks—including nuclear terrorism or bioterrorism—could make a valuable difference in the level of societal destruction and casualties.²¹

In the context of contemporary limited WMD threats, when the alternative of deterrence functioning predictably to prevent war may *not* exist, the opportunity cost of *not* pursuing damage-limiting capabilities could be exceedingly high. The possible reduction in societal destruction via damage-limitation capabilities may be a matter of good government and—for the United States—a fundamental responsibility of the federal government as mandated by the

Constitution. Of course, the actual value of defenses for any given contingency will be shaped by the nature of the threat, the cost of defenses, their expected effectiveness in reducing casualties and destruction, and the expectation that deterrence will work, fail, or be irrelevant in crisis.

During the Cold War, a common notion was that the deployment of strategic defenses for cities would be “destabilizing.”²² If the United States, for example, deployed strategic defenses for its cities, the concern was that the Soviet Union could be motivated to gain a strategic advantage by striking first for fear that the United States—emboldened by its defenses—might itself otherwise strike first. Strategic defenses were judged to be one of the few factors that would “destabilize” an otherwise stable balance of terror.

Despite the widespread acceptance of this notion that U.S. strategic defenses must be “destabilizing,” it was questionable during the Cold War and makes little sense in the contemporary environment. One way this author illustrates this point for students is to ask them to imagine that the United States and China are in a stable balance of terror relationship, i.e., neither country has an incentive to strike first for fear of the other’s unacceptable nuclear retaliation. Then I ask the students to imagine that the United States begins to build and deploy strategic defenses. Over the course of months or years, the United States builds defenses that protect from nuclear attack first 10% of the U.S. population, then 20%, then 30%, and so on to 90% of the population. One group of students is selected to represent the Chinese leadership. I ask these students at what point in this process and along this timeline are they motivated to initiate a strategic thermonuclear war with the United States—a war that will result in their own “assured destruction.” That point never occurs because the students are quick to realize that despite U.S. defenses, if their priority goal is national and/or personal survival, initiating a strategic nuclear war with the United States that will virtually ensure their own assured destruction is never in their interest. Even if the United States deploys thick defenses, they recognize that by striking first, China would simply ensure a strategic nuclear war in which they would lose their highest priority value. For these students, unencumbered by past notions of stability, the continuing survivability and effectiveness of U.S. *offensive retaliatory forces* eliminates any motivation they might otherwise have to strike first; there is no such instability even in the context of robust U.S. defenses.

The point of this exercise is to illustrate why U.S. strategic defenses need not be thought of as “destabilizing” in this sense, *if the United States simultaneously attends to the continuing deterrence effectiveness of its own offensive nuclear forces*. The students representing China in this experiment often suggest a wide variety of Chinese reactions to the U.S. deployment of defenses, but never is it to initiate a strategic nuclear war. Indeed, to the extent that the students believe that the United States is emboldened by its strategic defenses, they are quick to reassure the United States by word and deed that China will *not* engage in any such action lest the United States be provoked. In contrast, in these experiments all bets are off regarding benign Chinese behavior if China can regard U.S. offensive retaliatory nuclear forces as highly vulnerable to attack or ineffective. That, however, is the case with or without the added imagined presence of U.S. strategic defenses. When U.S. offensive forces provide deterrence stability against a first strike, U.S. defenses do not upset that stability.

2. Assurance

Another national goal that should contribute to the measure of U.S. strategic force adequacy is the *assurance* of allies, particularly including the contribution of U.S. strategic forces to extended deterrence. This goal is far from new and has great continuity over decades. The 1974 “Schlesinger Doctrine,” for example, included the standard of “essential equivalence” for U.S. strategic forces with the Soviet Union, in part to assure allies with regard to U.S. strategic guarantees. The notion was that allied perceptions of U.S. credibility would be strengthened if they viewed U.S. forces as being at least comparable to those of the Soviet Union.²³

Assurance involves *allied perceptions* of U.S. power and commitment,²⁴ and the related questions of what and how U.S. strategic capabilities can address allies’ unique fears and circumstances. Useful insight regarding the requirements for assurance may be gained through an effort to understand allied fears and perceptions. The step of asking allies how the United States might best provide the assurance necessary to help them remain secure and confident in their non-nuclear status is an obvious first step.

Some allies recently have been explicit that the *U.S. extended nuclear deterrent* is a key to their assurance and they link their own willingness to remain non-nuclear to the continuation of a credible U.S. extended nuclear deterrent. For example, some senior Japanese officials have

become seriously concerned about the continuing credibility of the U.S. extended nuclear deterrent; they have indicated that if the U.S. extended nuclear deterrent loses credibility, other security options will have to be examined. Some in Japan see specific characteristics of U.S. nuclear forces as particularly beneficial for extended deterrence; these force characteristics include a range of nuclear capabilities, flexibility, promptness, and precision to allow U.S. deterrence threats that are not made incredible by the prospect of excessive collateral damage. Japanese officials have indicated support for the ultimate elimination of nuclear weapons, but also that this process must be pursued in a careful, step by step manner that ensures Japanese security. This mandates the maintenance of a credible U.S. nuclear deterrent for the foreseeable future.

NATO allies often insist that U.S. nuclear weapons must remain *deployed in Europe* to provide the necessary assurance while Japanese officials are equally explicit that U.S. nuclear weapons must be “on-call” in a timely fashion, but *not deployed on Japanese territory*. The contemporary challenge in this regard is obvious: as WMD spread to regional rogue powers, U.S. allies in rough neighborhoods correspondingly become increasingly concerned about the details of the U.S. extended deterrence commitment and the forces intended to make it credible. Their various and diverse views with regard to U.S. nuclear forces necessary for extended deterrence will need to be integrated and prioritized.

There is a direct connection between allied perceptions of the assurance value of U.S. nuclear weapons for extended deterrence and nuclear non-proliferation: the U.S. withdrawal of its *nuclear* extended deterrent coverage would create new and powerful incentives for nuclear proliferation among U.S. friends and allies who, to date, have felt sufficiently secure under the U.S. extended nuclear deterrent to remain non-nuclear.²⁵ As a 2007 report by the Department of State’s International Security Advisory Board concludes:

There is clear evidence in diplomatic channels that U.S. assurances to include the nuclear umbrella have been, and continue to be, the single most important reason many allies have foresworn nuclear weapons. This umbrella is too important to sacrifice on the basis of an unproven ideal that nuclear disarmament in the U.S. would lead to a more secure world....a lessening of the U.S. nuclear umbrella could very well trigger a cascade [of nuclear proliferation] in East Asia and the Middle East.²⁶

The United States can decide what priority to place on the assurance of allies, and how it will proceed to support that goal, but only the allies can decide if they are assured. In the

contemporary environment, available evidence suggests strongly that assurance is an important goal and that the particular characteristics for U.S. *nuclear weapons* described above are critical to the assurance of key allies.

3. Dissuasion and Inducements

Another national goal that should be included in the measure of U.S. strategic force adequacy is dissuasion. Dissuasion also is not new; it was articulated well as a national goal by Secretary McNamara in the 1960s,²⁷ and the Clinton Administration's "lead and hedge" strategy was intended to help dissuade a Russian return to arms racing.

Dissuasion is the "flip side" of the traditional recommendation that U.S. strategic force choices be guided by the expectation that U.S. *restraint would induce opponents' restraint*. The expectation is that U.S. armament choices should be shaped by the goal of affecting opponents' weapons acquisition policies. With dissuasion, the contention is that in some cases the manifest capability of standing U.S. forces or the U.S. potential for the acquisition of strategic capabilities can *discourage* opponents from competition; the goal is to undercut the opponent's expected value from arms competition to such an extent that the opponent decides against competition.

Dissuasion adds a unique temporal dimension to the measures of merit for U.S. strategic forces and the definition of adequacy. The seeds of dissuasion must be sown *in advance* of the manifest appearance of a threat. To discourage opponents from taking the course of armaments competition, by definition, requires the dissuasive effect of U.S. strategic potential when opponents are making acquisition decisions, not after the threat emerges. If dissuasion works, the feared competition never materializes. There are several possible contemporary U.S. dissuasion goals, including:

- Rogue states from investing in WMD and missiles;
- The Chinese leadership from pursuing a significant buildup of strategic nuclear weapons; and,
- The Russian leadership from reverting to the former Soviet goal of building up its strategic forces in pursuit of counterforce capabilities against the United States.

Whether and how the character of U.S. strategic forces can contribute to dissuasion is *not* self-evident, and numerous uncertainties are unavoidable in attempting to dissuade. Nevertheless, the potential for dissuasion linkages may yield to examination, and considering

how to dissuade opponents and potential opponents via the size and character of U.S. strategic forces is as coherent a goal as attempting to induce an opponent's inaction via U.S. inaction—a *related self-described element of U.S. strategic policy for decades*.

For example, the continued unbeatable survivability of U.S. deterrent forces may be a key to discouraging any future incentives for Russia or China to see value in a Soviet-like bid to acquire extensive counterforce strategic capabilities. And, the U.S. potential to develop, deploy and reconstitute forces in a timely way may be a key to the U.S. capability to dissuade opponents from taking unwanted deployment initiatives.

Multiple Goals, Strategic Force Sizing, and Contemporary Measures of Merit for U.S. Strategic Forces

The measures of merit for nuclear forces must transcend the single goal of deterrence and the old narrow formula for determining requirements for that goal. The labels for damage limitation, assurance, and dissuasion may change, and their respective priorities will shift across time and circumstance, but they are U.S. goals of great continuity and pertinence to the contemporary threat environment. How could they *not* be included in the calculation of U.S. strategic forces?

Given multiple goals with shifting priorities and the diversity of strategic forces that may be suited to these goals, an overarching U.S. strategic requirement is for resilience in the U.S. force structure and the U.S. capability to adapt planning to variable demands. There is no “point solution” in terms of U.S. force numbers or types that can withstand time or scrutiny. Consequently, an arms control agenda that attempts to codify any point solution risks “locking in” a force structure that is incompatible with shifting U.S. needs.

Strategies for deterrence, assurance, dissuasion, and defense—and the calculation of force requirements to support those goals—should be informed to the extent possible by a comprehensive understanding of specific opponents and allies in order to tailor U.S. strategies accordingly, set priorities and limit the prospects for surprise. And, in a dynamic strategic environment, U.S. strategic forces should provide defensive hedges, including the potential for imperfect protection against the possibility of surprising behavior and deterrence failure.

If U.S. force sizing is to be goal/strategy-driven—as opposed to U.S. strategies being driven by some pre-selected, preferred number of warheads—the calculation of U.S. strategic

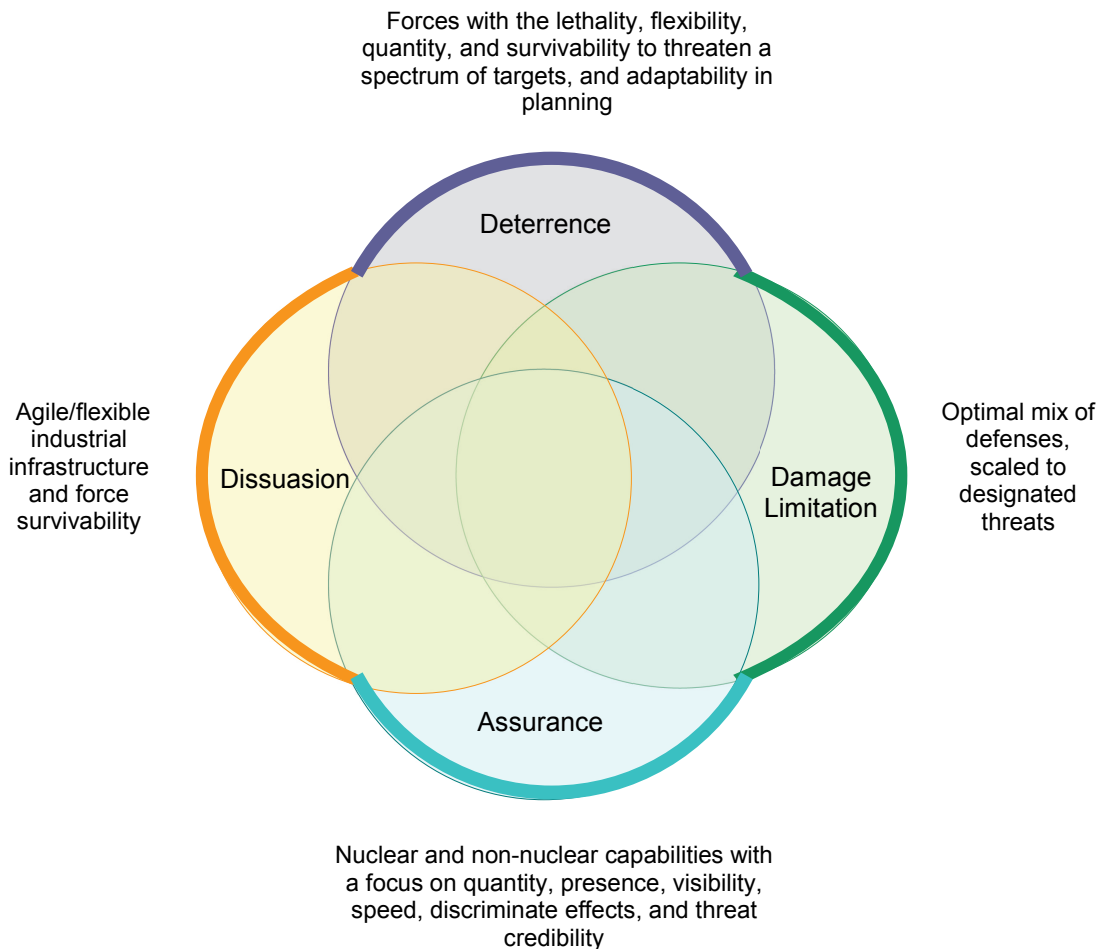
requirements must reflect the integration and rationalization of shifting requirements across these goals. No single definition of requirements for deterrence, assurance, dissuasion, or defense can be adequate. There are likely to be overlapping force requirements to support these goals, but no one goal is likely to suggest precisely the same set of force requirements as another because the goals themselves are so different.

Approaching the question of U.S. strategic force sizing as the integration of requirements across multiple national goals suggests some conclusions about general principles for U.S. strategic forces. While precise requirements and details must await the type of broad-based, comprehensive net assessment suggested above, these general principles are important starting points and can be identified. They include the following:

- The most important deterrence-related post-Cold War measures of merit for U.S. forces include the quantity and lethality necessary to threaten the spectrum of targets potentially important for deterrence, and the resilience of the U.S. force structure and adaptability of U.S. deterrence planning and strategies to adjust to shifting threats and contingencies.
- The requirements for assurance must include an understanding of and integration of allied concerns. Those concerns appear to focus on the provision of U.S. *nuclear* capabilities with various preferred force characteristics and locations. This points to a spectrum of possible requirements because allies judge U.S. forces according to their own varying and unique security circumstances. Some allies appear to care deeply about the quantity, characteristics and location of U.S. nuclear forces. Ensuring that U.S. strategic capabilities are seen as being at least comparable to those of Russia appears to be a basic parameter for assurance.
- The requirements for damage limitation and optimal defensive measures also will vary considerably depending on the set of threats against which U.S. officials expect them to perform and the desired level of effectiveness. The threats to be considered could include terrorist and rogue WMD threats that are judged to be of questionable susceptibility to deterrence. In addition, numerous past analyses suggest that relatively austere civil defense measures can provide the highest initial return on the dollar for protection across a broad spectrum of plausible nuclear threats.
- Given the unique timeline associated with the requirements for dissuasion, they are likely to include the manifest potential of the U.S. industrial infrastructure to respond to bids for competition well before threats materialize. The more agile and flexible is the U.S. capability to do so, the less is the likely need for standing U.S. forces to carry the burden of dissuasion. To the extent that the U.S. infrastructure is moribund, the greater is the opportunity for opponents to see the potential value in arms competition. In addition, the long-standing

requirement for U.S. force survivability could help discourage any repeat of a Soviet-like drive by China or Russia to acquire a powerful counterforce capability against U.S. strategic forces.

U.S. strategic force requirements may be considered as the sum of these parts. The graphic below illustrates conceptually that the national goals discussed here suggest a variety of basic measures of merit for strategic forces, and are likely to entail both overlapping and unique strategic forces requirements. The prioritization of these goals and the instruments used to advance them will change with different threat circumstances, defense budgets, and technical and political realities. But, as noted above, the goals themselves have had great continuity. Even if budgets, technical and political realities preclude meeting the various requirements suggested by these goals, understanding their basic strategic force requirements should help us to identify force measures of merit coherently and to understand potential contradictions, trade offs and short falls, and thus to allocate wisely the resources that are available.



In the contemporary strategic environment, it is impossible to provide high-confidence, quantitatively precise and enduring answers to the question “how much is enough” for deterrence. The familiar game of linking some specific number of nuclear weapons with confidence in deterrence and the adequacy of U.S. strategic forces in general remains popular, but it now is unsupportable. Whether the answer from the old formula now offered is 100, 500, 1000, or 1500 weapons, that answer is of little value for defining deterrence requirements apart from the rigorous analysis of opponents and contexts described above. And, even if done rigorously, identifying the requirements for deterrence is an incomplete basis for defining the necessary parameters for U.S. strategic forces in general. The integration of requirements across the four goals described above, however, does point to some important specific measures of merit for U.S. strategic forces.

The range of weapon numbers and types deemed necessary for deterrence is likely to be fluid, but the resilience, flexibility and survivability of U.S. forces important for deterrence and dissuasion point to the continuing value of multiple U.S. strategic force platforms. The traditional nuclear Triad of ICBMs, SLBMs, and heavy bombers has long been valued for the flexibility and survivability inherent in its differing attributes and redundancy. A different mix of strategic force platforms may provide the same benefits in the future, but the flexibility and survivability of forces provided by a diversity of strategic platforms will remain important. Those platforms also should allow some margin for uploading and downloading weapons as necessary to assure, deter, dissuade, and defend in a dynamic threat environment.

The goal of assurance provides some additional pertinent metrics for U.S. force adequacy. For example, officials in some NATO countries have indicated that U.S. strategic nuclear force levels should be comparable to Russia’s and that U.S. nuclear weapons must remain deployed on NATO territory. These metrics appear to have nothing to do with the possible demands of “warfighting,” but are important for the psychological/political goal of allied assurance. And, as noted above, Japanese officials have indicated that for deterrence purposes U.S. nuclear forces, while not deployed on Japanese territory, should be credible, readily available in the area and visible as necessary. This mix of desirable characteristics again suggests the value of a vigorous industrial infrastructure, and a mix of U.S. force platforms with a range of possible force loadings.

The force attributes of resilience, flexibility and survivability, and the adaptability of U.S. planning and force development were compatible with the Cold War's high numbers of weapons and strategic platforms, and with continuous nuclear modernization programs. Those attributes may also be possible at much lower numbers of deployed forces and platforms; but ever lower numbers will impose limitations on these measures of merit and call into question the viability of the U.S. industrial infrastructure necessary to produce strategic forces. Recognition of these various force and infrastructure attributes important for deterrence, assurance, dissuasion, and damage limitation should contribute to how "adequacy" is defined for the U.S. strategic arsenal, U.S. acquisition, policies and the U.S. arms control agenda. If so, some helpful parameters will be injected into the on-going discussion of "how much is enough."

¹ Portions of this article are adapted from Keith B. Payne, *The Great American Gamble: Deterrence Theory and Practice from the Cold War to the Twenty-First Century* (Fairfax, VA: National Institute Press, 2008) and Keith B. Payne (study director) *Planning the Future U.S. Nuclear Force, Volumes I and II* (Fairfax, VA: National Institute Press, 2009).

² For example, see the explicit use of this target-based methodology linked to deterrence in, *Statement Of Gen. John T. Chain, Jr., USAF, Commander-In-Chief, Strategic Air Command, U.S. Senate, Committee On Armed Services*, in, U.S. Senate, Committee on Armed Services, Hearing, *Testing And Operation Requirements For The B-2 Bomber*, 101st Congress, 1st Session, July 21, 1989 (Washington, D.C.: USGPO, 1989), pp. 8-20. See also, George J. Seiler, Captain, USAF, *Strategic Nuclear Force Requirements and Issues*, Research Report No. AU-ARI-82-1 (Maxwell Air Force Base, Alabama: Air University Press, February 1983).

³ Steve Fetter, "Nuclear Strategy and Targeting Doctrine," in, *The Nuclear Turning Point*, Harold A. Feiveson, ed. (Washington, D.C.: The Brookings Institution Press, 1999), p. 57. (Emphasis added).

⁴ Kingston Reif, "Nuclear Weapons: The Modernization Myth," *The Bulletin of the Atomic Scientists Newsletter*, December 21, 2009, at <http://thebulletin.org/web-edition/features/nuclear-weapons-the-modernization-myth>. Accessed December 22, 2009.

⁵ Jay C. Davis, "The Attribution of WMD Events," *Journal of Homeland Security*, April 2003, available at, <http://www.homelandsecurity.org/journal/Articles/Davis.html>. See also, Matthew Phillips, "Uncertain Justice for Nuclear Terror: Deterrence of Anonymous Attacks Through Attribution," *Orbis*, Vol. 51, No. 3 (Summer 2007), pp. 429-446.

⁶ Dr. Gordon Oehler, Director, Nonproliferation Center, "Continuing Threat From Weapons of Mass Destruction," statement for the record to the Senate Armed Services Committee, March 27, 1996, Appendix C: Biological Agents, available at, https://www.cia.gov/news-information/speeches-testimony/1996/go_appendixc_032796.html; W. Seth Carus, *Bioterrorism and Biocrimes: The Illicit Use of Biological Agents Since 1900* (Washington, D.C.: National Defense University, February 2001), p. 20.

⁷ See the discussion of the extreme fluidity of contemporary developments in, National Intelligence Council, *Mapping the Global Future: Report of the National Intelligence Council's 2020 Project* (Undated, unclassified briefing), pp. 4, 18-19. See also the discussion of past rapid changes in threat conditions in, William Odom et al., *The Emerging Ballistic Missile Threat to the United States*, Report of the Proliferation Study Team (Fairfax, VA: National Institute for Public Policy, February 1993), pp. 19-21.

⁸ Gordon Craig and Alexander George, *Force and Statecraft: Diplomatic Problems of Our Time*, Third Edition (New York: Oxford University Press, 1995), p. 188.

⁹ Yehezkel Dror, "High-Intensity Aggressive Ideologies as an International Threat," *The Jerusalem Journal of International Relations*, Vol. 9, No. 1 (March 1987), p. 161.

¹⁰ Quoted in, "Pak's N-bomb prevented India from Attacking it After 26/11," *Press Trust of India*, March 9, 2009, available in, U.S. Department of State, *ISN News*, March 10, 2009.

¹¹ As concluded by Richard Ned Lebow and Janice Gross Stein, *We All Lost the Cold War* (Princeton, NJ: Princeton University Press, 1994), p. 356.

¹² See the statement by Harold Brown in, U.S. Senate, Committee on Armed Services, *MX Missile Basing System and Related Issues*, Hearings, 98th Congress, 1st Session (Washington, D.C.: USGPO, 1983), pp. 6-7.

¹³ Jonathan Medalia, "Bunker Busters": *Robust Nuclear Earth Penetrator Issues, FY2005-FY2007*, Congressional Research Service Report for Congress, RL32347 (February 21, 2006); and, Jonathan Medalia, "Bunker Busters": *Sources of Confusion in the Robust Nuclear Earth Penetrator Debate*, Congressional Research Service Report for Congress, RL325599 (September 22, 2004), p. 1. See also the extended discussion of this subject in, Kurt Guthe, "Implications of a Dynamic Strategic Environment," in, Keith Payne et al., *Rationale and Requirements for U.S. Nuclear Weapons and Arms Control, Volume II* (Fairfax, VA: National Institute for Public Policy, 2001), pp. 64-69.

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¹⁵ Kurt Guthe, *Ten Continuities in U.S. Nuclear Weapons Policy, Strategy, Plans and Forces* (Fairfax, VA: National Institute for Public Policy, 2008).

¹⁶ Draft Memorandum for the President, Secretary of Defense [Robert S. McNamara] to the President [Lyndon B. Johnson], Subj: Recommended FY 1966-FY 1970 Programs for Strategic Offensive Forces, Continental Air and Missile Defense Forces, and Civil Defense, December 3, 1964, p. 24. (Originally classified; sanitized and declassified on January 5, 1983).

¹⁷ Dr. Cham Dallas, *Impact of Small Nuclear Weapons on Washington, DC: Outcomes and Emergency Response Recommendations*, Written Statement to Accompany Testimony at the United States Senate Hearing for the Committee on Homeland Security and Governmental Affairs, titled, "Nuclear Terrorism: Confronting the Challenges of the Day After," *ibid.*, p. 6.

¹⁸ Dr. Cham Dallas, *Impact of Small Nuclear Weapons on Washington, DC: Outcomes and Emergency Response Recommendations*, Written Statement to Accompany Testimony at the United States Senate Hearing for the Committee on Homeland Security and Governmental Affairs, titled, "Nuclear Terrorism: Confronting the Challenges of the Day After," April 15, 2008, Washington, D.C., pp. 6-11 (Prepared text).

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²⁰ Draft Memorandum for the President, Secretary of Defense [Robert S. McNamara] to the President [Lyndon B. Johnson], Subj: Recommended FY 1965-FY 1969 Strategic Retaliatory Forces, December 6, 1963, p. I-21-I-22. (Originally classified; sanitized and declassified on January 5, 1983).

²¹ Ashton Carter, Michael May, and William Perry, "The Day After: Action Following a Nuclear Blast in a U.S. City," *The Washington Quarterly*, Vol. 30, No. 4 (Autumn 2007), pp. 23-27; Keith B. Payne et al., *Bioterrorism and a Strategy of Concomitant Deterrence* (Fairfax, VA: National Institute for Public Policy, September 2007), pp.78-88.

²² See Keith B. Payne, *The Great American Gamble: Deterrence Theory and Practice From the Cold War to the 21st Century* (Fairfax, VA: National Institute Press, 2008), pp. 43-44, 219-220.

²³ See a review of the officially-expressed reasons for essential equivalence in, Keith B. Payne, "The Schlesinger Shift: Return to Rationality," in, Keith B. Payne, C. Johnston Conover, and Bruce Bennett, *Nuclear Strategy: Flexibility and Stability* (Santa Monica, CA: California Seminar on Arms Control and Foreign Policy, March 1979), pp. 1-48.

²⁴ Michael Howard, "Reassurance and Deterrence," *Foreign Affairs*, Vol. 61, No. 2 (Winter 1982/1983), pp. 309-324.

²⁵ See the discussion in, U.S. Department of State, International Security Advisory Board, *Report on Discouraging a Cascade of Nuclear Weapons States* (Washington, D.C.: United States Department of State, October 19, 2007), pp. 22-23.

²⁶ *Ibid.*, p. 23.

²⁷ Draft Memorandum for the President, Secretary of Defense [Robert S. McNamara] to the President [Lyndon B. Johnson], Subj: Recommended FY 1967 - FY 1971 Strategic Offensive and Defensive Forces, November 1, 1965, pp. 5, 22. (Originally classified; sanitized and declassified on January 5, 1983); Draft Memorandum for the President, Secretary of Defense [Robert S. McNamara] to the President [Lyndon B. Johnson], Subj: Strategic Offensive and Defensive Forces, January 15, 1968, p. 13. (Originally classified; sanitized and declassified on January 5, 1983).