

“A U.S. MINIMUM NUCLEAR DETERRECE STRATEGY”:  
BY DESIGN OR DEFAULT IT'S ABOUT THE POLICY OPTIONS

BY

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**APPROVAL**

The undersigned certify that this thesis meets master's-level standards of research, argumentation, and expression.

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## ABSTRACT

U.S. strategic nuclear arsenal reductions are not new. However, wading headstrong into nuclear abolition without an understanding of the policy options forfeited by these actions is dangerous and potentially destabilizing. If blindly pursued, U.S. strategic arsenal reductions will, at a point dictated by default and not by design, back U.S. policymakers into the forced adoption of a minimum deterrence strategy (MDS). In doing so, those policymakers must understand the ramifications such an adoption will have to U.S. security policy options, including the ability to conduct preventive nuclear first strikes, the ability to strike targets other than population centers, and the ability to offer extended nuclear deterrence to allies and partners. This study examined how other nuclear weapons nations adopted and then employed an MDS with the purpose of providing an understanding of U.S. policy options available accompanying the adoption of an MDS associated with a significant reduction to the U.S. strategic nuclear arsenal.

This study researched how and why four lesser nuclear weapons nations (the UK, France, India, and China) chose or were forced to adopt an MDS, how their nuclear arsenal acquisitions, strike strategies, and targeting schemes supported their MDS variation, and finally how each nation communicated their nuclear deterrence capabilities and will of use. When available, the exploration expanded to include other lesser nuclear weapons states such as Pakistan, Israel, and South Africa (the only nation to acquire and then forfeit its nuclear weapons). The study made comparisons between how and why each case-study nation adopted its variation of an MDS, how and why it placed limits on its arsenal's composition, and the clarity with which it communicated its deterrence messaging.

The research shows a number of specific findings including an updated definition for deterrence along with a recast arrangement between deterrence, coercion, and compellence. Additionally, the study provides a rationale to why nations pursue nuclear weapons. Furthermore, there is an exploration of several deterrence strategies with a focus on variations to the minimum deterrence strategy.

The study subsequently derived several conclusions regarding how the case-study nations adopted and adapted an MDS to meet policymakers' objectives. The first conclusion is that most nations pursue nuclear weapons as a means of maintaining security while some pursue them to gain prestige. In the second conclusion, the nations examined limited their arsenals for reasons of cost or ideology. Additional conclusions identified consistencies and divergences in the clarity of communicating nuclear capabilities and will of use.

Without an understanding of the conclusions drawn from this study, it is likely that U.S. policymakers will adopt an MDS by default and not by design. Much like the UK, the U.S. will 'back into' an MDS due to the rising costs of maintaining a nuclear arsenal intersecting with the political drive to reach a world free of nuclear weapons. Therefore, the study recommends that the next strategic arsenal reduction maintain a force of no less than 1,000 strategic weapons. Following this path will allow policymakers to consider the options gained, retained, truncated, or surrendered when adopting an MDS by design, before backing into one by default.

While pursuing a world without nuclear weapons is a noble cause, U.S. policymakers must approach future negotiations with an understanding of the effects a reduction in the strategic nuclear arsenal will have on policy options. While deterrence does not change with smaller arsenals, its strategies do. The U.S. adoption of an MDS by default is not in the nation's best interests when the opportunity to adopt one by design is available.

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## Introduction

*In a strange turn of history, the threat of global nuclear war has gone down, but the risk of a nuclear attack has gone up...as the only nuclear power to have used a nuclear weapon, the United States has a moral responsibility to act... So today I state clearly and with conviction America's commitment to seek the peace and security of a world without nuclear weapons. Countries with nuclear weapons will move towards disarmament, countries without nuclear weapons will not acquire them...*

– President Obama, Prague Speech

*This historic resolution we just adopted [UNSC Resolution 1887 of 2009], enshrines our shared commitment to the goal of a world without nuclear weapons... that nations with nuclear weapons have the responsibility to move toward disarmament; and those without them have the responsibility to forsake them.*

– Remarks by the President Obama at  
the United Nations Security Council Summit on  
Nuclear Non-Proliferation and Nuclear  
Disarmament

Actions by the last two U.S. administrations have reduced the number of strategic nuclear weapons available for the sustainment of national protection and the fulfillment of obligations. Both the Treaty on Strategic Offensive Reductions (The Moscow Treaty) and the Strategic Arms Reduction Treaty III (New START) signaled, and then enacted, reductions in the strategic nuclear arsenals of both the United States and Russia.<sup>1</sup> This latest treaty reduces the strategic arsenals of these two nations to numbers of no greater than 700 deployed (and up to 800 non-deployed) missiles and bombers capable of delivering no greater than 1,550 deployed warheads.<sup>2</sup>

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<sup>1</sup> Since the end of the Cold War, the United States and Russia have reduced operationally deployed strategic nuclear weapons by about 75 percent, but both retain many more nuclear weapons than they need for deterrence. For more, see Department of Defense, Nuclear Posture Review Report, Recurring NPR (Washington, DC: Department of Defense, April 2010), ix.

<sup>2</sup> 1,550 warheads. Warheads on deployed ICBMs and deployed SLBMs count toward this limit and each deployed heavy bomber equipped for nuclear armaments counts as one warhead toward this limit (this limit is 74% lower than the limit of the 1991 START Treaty and 30% lower than the deployed strategic warhead limit of the 2002 Moscow Treaty). The Treaty stipulates a combined limit of 800 deployed and non-deployed ICBM launchers, SLBM launchers, and heavy bombers equipped for nuclear armaments. The Treaty also stipulates a separate limit of 700 deployed ICBMs, deployed SLBMs, and deployed heavy bombers equipped for nuclear armaments (this limit is less than half the corresponding strategic nuclear delivery vehicle limit of the START Treaty). The Treaty's duration will be ten years, unless superseded by a subsequent agreement. The Parties may agree to extend the Treaty for a period of no more than five years. For more, see The White House, Office of the Press Secretary (2010), "Key Facts about the New START Treaty [Press Release]," retrieved from <http://www.whitehouse.gov/the-press-office/key-facts-about-new-start-treaty> (accessed 20 December 2011).

Nevertheless, this is just a waypoint upon the journey, a layover enroute “towards a world without nuclear weapons.”<sup>3</sup>

While President Obama’s vision is grandiose, he supports his objective through a realistic approach. “As long as these [nuclear] weapons exist, the United States will maintain a safe, secure and effective arsenal to deter any adversary, and guarantee that defense to our allies.”<sup>4</sup> The present composition of the arsenal, and the strategy derived from its availability and effectiveness, identifies U.S. nuclear policy as either nuclear primacy or, more likely, maximum deterrence.<sup>5</sup> By placing a diminished importance on strategic nuclear weapons, either through policy changes or in combination with arsenal reductions, the U.S. could reach a state of minimum deterrence, either by default or by design. What is the effect of such a downsizing on U.S. nuclear strategy?

Until today, minimum deterrence has been a strategy of lesser powers. The policy was of singular purpose: the maintenance of survival interests. In contemplating adopting a minimum deterrence strategy, U.S. national security strategists will need to address the policy options available and abandoned by its embracement and the effects it will have on allies and partners. Before taking the next step in treaty-based force reductions, the President needs to be aware of the policy options gained, retained and surrendered in adopting a minimum deterrence strategy. These options will color the picture of consequences associated with pursuit of a world without nuclear weapons.

### **Benefits of Retaining Nuclear Weapons**

The fact that most threats are now less threatening does not mean that nuclear deterrence is irrelevant.<sup>6</sup> “To assert confidently that US nuclear weapons no longer are valuable for deterrence purposes, however, is to claim knowledge about how varied contemporary and future leaders in diverse and often unpredictable circumstances will interpret and respond to the distinction between nuclear and nonnuclear threats.”<sup>7</sup> While Keith Payne’s statement points to nuclear weapons retention as a means of staving off future unknown threats, others argue that present-day threats warrant their preservation. Nuclear arsenals can deter attacks made by

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<sup>3</sup> Barack H. Obama, “Remarks in Prague, Czech Republic,” Daily Compilation of Presidential Documents 00228 (April 5, 2009): 3, <http://www.gpo.gov/fdsys/pkg/DCPD-200900228/pdf/DCPD-200900228.pdf> (accessed 4 January 2012).

<sup>4</sup> Obama, “Remarks in Prague, Czech Republic,” 3-4.

<sup>5</sup> Tom Sauer, “A Second Nuclear Revolution: From Nuclear Primacy to Post-Existential Deterrence,” *The Journal of Strategic Studies* 32, no. 5 (October 2009): 747-748.

<sup>6</sup> Bruno Tertrais, “In Defense of Deterrence: The Relevance, Morality and Cost-Effectiveness of Nuclear Weapons,” *Proliferation Papers*, no. 39 (Fall 2011): 35.

<sup>7</sup> Keith B. Payne, “On Nuclear Deterrence and Assurance,” *Strategic Studies Quarterly* 3, no. 1 (Spring 2009): 44.

chemical or biological weapons, and can deter state-sponsored acts of nuclear terrorism. They dissuade other major powers from engaging in arms races, prevent nuclear proliferation, and reassure allies through extended deterrence commitments. Integrating with Payne's statement, nuclear arsenals provide a general 'insurance' against future strategic threats to a range of 'vital interests'.<sup>8</sup> While the threat to vital interests is less than they were during the Cold War, what is 'vital' today may be the 'survival' of yesterday, and thus requires nuclear deterrence for protection.<sup>9</sup>

In pursuing significant reductions in the U.S. strategic nuclear arsenal, it seems wise to build support for retaining some number of weapons. The president's statement in Prague, though with a caveat, is to reach a condition of a world without nuclear weapons, a global zero. Until then, the U.S. will maintain some number of weapons in its arsenal. One reason that may force the U.S. to retain nuclear weapons is that in a world without them, the U.S. would be at a distinct military advantage relative to other states.<sup>10</sup> Prospective U.S. opponents, or even some competitive or vulnerable allies, may see the delta between having a few nuclear weapons for security and none as too great. They might balk at total destruction of their nuclear inventories as a balance against future unknown U.S. intentions.<sup>11</sup> By extension, these actions would force the U.S. to maintain an arsenal as well, for both deterrence and an equivalent coercive retaliation. "From this standpoint...a world of [a] few nuclear weapons states may be preferable to the costs of getting to zero."<sup>12</sup>

Another fortunate problem for strategic nuclear weapons vis-à-vis U.S. national security is the almost lacking nonexistent existential threat. While the current Russian arsenal is capable of wreaking havoc, and the Chinese one providing a moment of pause, neither nations' geopolitical positions warrant Cold War-level distrust and threat necessitating a nuclear excess. Therefore, direct nuclear threats to U.S. nation security stem from proliferation, risks of accidents and unauthorized or inadvertent use, and terrorism.<sup>13</sup> Retaining some U.S. nuclear weapons status quo will aid in suppressing these concerns along with benefits gained by assuring allies, dissuading and deterring adversaries, and hedging against uncertainty.<sup>14</sup>

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<sup>8</sup> Nick Ritchie, "Deterrence Dogma? Challenging the Relevance of British Nuclear Weapons," *International Affairs* 85, no. 1 (2009): 83.

<sup>9</sup> Tertrais, "In Defense of Deterrence," 35.

<sup>10</sup> Stephen J. Cimbala, "Nuclear Arms Reductions, Abolition and Nonproliferation: What's Ideal, What's Possible, What's Problematic?," *Journal of Slavic Military Studies*, no. 22 (2009): 339.

<sup>11</sup> Cimbala, "Nuclear Arms Reductions," 339.

<sup>12</sup> Cimbala, "Nuclear Arms Reductions," 340.

<sup>13</sup> Group Capt Tim D. Q. Below, "US Nuclear Deterrence: An Opportunity for President Obama to Lead by Example," *Air and Space Power Journal* XXII, no. 4 (Winter 2009): 90.

<sup>14</sup> Below, "US Nuclear Deterrence," 93.

### Why Consider Minimum Deterrence Now?

As listed in the opening, President Obama has placed the U.S. on a trajectory of reducing (significantly) its strategic nuclear weapons arsenal. By extension, this action necessitates a change to the policies on their use and to the country's deterrence strategy. By implication, the President's belief projects a reduced importance to nuclear weapons.<sup>15</sup> Over the 67-year history of nuclear weapons, a number of nations have fought wars in which they were unable to find a role for their nuclear weapons. Both the United States and the Soviet Union fought wars in which their nuclear weapons could not prevent defeat (Vietnam and Afghanistan).<sup>16</sup> Speculatively, if nuclear weapons played no role in the surrender of Japan, perhaps it is time to conduct a serious, far-reaching review of the general usefulness of nuclear weapons.<sup>17</sup> President Obama has set the U.S. on that path, both in his remarks made in Prague and in his statements and accompanying passage of UNSC Resolution 1887, enshrining a shared committed goal commitment to achieving a world without nuclear weapons.

A nuclear weapons strategy enacting maximum deterrence requires the need to possess a large quantity of weapons based on different kinds of delivery vehicles.<sup>18</sup> Additionally, this strategy requires maintaining parity with the central adversary. The current nuclear weapons policies of both the U.S. and Russia *still* [original emphasis] correspond to maximum deterrence.<sup>19</sup> However, these positions are the exception, not the rule. The majority of nations with nuclear weapons have relatively small arsenals.<sup>20</sup>

Only four nuclear powers have more than 200 nuclear weapons of all kinds in their arsenals, and estimates placed three others at having fewer than 60 strategic weapons.<sup>21</sup> Nations that acquire nuclear weapons in the near future are likely to have small arsenals.<sup>22</sup> Yet these 'small' arsenal states are not small economically. Four of the five small states have national incomes that equal or exceed that of Russia, and one (China) is on course to overtake the U.S. in

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<sup>15</sup> "The United States will continue to strengthen conventional capabilities and reduce the role of nuclear weapons in deterring non-nuclear attacks, with the objective of making deterrence of nuclear attack on the United States or our allies and partners the sole purpose of U.S. nuclear weapons." Department of Defense, Nuclear Posture Review Report, ix.

<sup>16</sup> Ward Wilson, "The Winning Weapon? Rethinking Nuclear Weapons in Light of Hiroshima," *International Security* 31, no. 4 (Spring 2007): 179.

<sup>17</sup> Wilson, "The Winning Weapon?," 179.

<sup>18</sup> Sauer, "Second Nuclear Revolution," 748.

<sup>19</sup> Sauer, "Second Nuclear Revolution," 749.

<sup>20</sup> Wilson, "The Winning Weapon?," 178.

<sup>21</sup> Wilson, "The Winning Weapon?," 178.

<sup>22</sup> Wilson, "The Winning Weapon?," 178-179.

economic strength within a decade or so.<sup>23</sup> So why not expend some of that national income and graduate the nuclear weapons arsenal to something on par with the U.S. or Russia? Though not ruled-out for China and India, the costs associated with maintaining a safe, secure, and effective nuclear weapons arsenal to conduct a maximum deterrence strategy are oppressive and ripe for fiscal belt-tightening.<sup>24</sup>

At present, the U.S. faces a \$15 trillion national debt and a fiscal year 2013-projected national deficit of \$1.3 trillion.<sup>25</sup> Intertwined is a nearly \$500 billion, 10-year reduction in projected defense spending.<sup>26</sup> A proposed source for spending relief has been further reductions to the U.S. nuclear weapons arsenal. While the arsenal is progressing in its drawdown to the New START treaty numbers, it has yet to reach a “status quo” condition.<sup>27</sup> In balancing national defense requirements against imposing fiscal pressures, Chairman of the Joint Chiefs of Staff General Dempsey stated that although “maintaining the status quo is one option, further cuts are consistent with President Barack Obama’s 2009 promise to pursue the elimination of nuclear weapons and the 2010 Nuclear Posture Review, which called for an ‘implementation study’ by the Defense Department to review the nation’s nuclear deterrence requirements with an eye toward further reductions in the size of the arsenal.”<sup>28</sup>

While reductions in the arsenal are ripe for fiscal reductions, the complete abolition to a nuclear-zero state would be unwise in the current and near-term future. Competing with shrinking arsenals is the emergence of new nuclear weapon states. These states have a forecasted emergence of approximately one every six to seven years dating back to 1945.<sup>29</sup> “As long as the nuclear weapon states claim that nuclear weapons are ‘essential’ for their security, and keep nuclear weapons in their arsenals, we should not be surprised to see the arrival of new nuclear

<sup>23</sup> Malcolm Chalmers, “Introduction and Overview,” *Small Nuclear Forces: Five Perspectives*, Royal United Services Institute for Defence and Security Studies (RUSI) Report (London: Whitehall Reports, December 2011), 4.

<sup>24</sup> In the cases of China and India, the size of their nuclear arsenals may simply be a lagging variable, likely to catch up with their burgeoning economic might in the coming period. For more, see, Chalmers, “Small Nuclear Forces,” 6-7.

<sup>25</sup> US Debt Clock.org, “US NATIONAL DEBT” and “US FEDERAL BUDGET DEFICIT,” <http://www.usdebtclock.org> (accessed 22 April 2012).

<sup>26</sup> The White House, Office of the Press Secretary (2012). “Fact Sheet: Bipartisan Debt Deal: A Win for the Economy and Budget Discipline [Press Release],” retrieved from <http://www.whitehouse.gov/fact-sheet-victory-bipartisan-compromise-economy-american-people> (accessed 22 April 2012).

<sup>27</sup> “status quo” – a ceiling of 1,550 long-range, deployed warheads agreed upon under the current U.S. treaty with Russia. For more, see Phil Stewart and David Alexander, “Pentagon Chiefs Grilled Over Possible Nuclear Cuts,” Reuters.com, 15 February 2012, <http://www.reuters.com/article/2012/02/15/us-usa-nuclear-pentagon-idUSTRE81E28X20120215>.

<sup>28</sup> Donna Cassata and Robert Burns, “GOP Pushes Back Against Any Further Cuts in Nukes,” Associated Press, 15 February 15 2012, <http://news.yahoo.com/gop-pushes-back-against-further-cuts-nukes-205337785.html>.

<sup>29</sup> Sauer, “Second Nuclear Revolution,” 753.

weapon states.”<sup>30</sup> “The chance, therefore, of a nuclear war involving an exchange of only a handful of nuclear weapons is significant and continually increasing.”<sup>31</sup> Until that chance reduces to zero by achieving a nuclear-zero world, “the United States will maintain a safe, secure and effective arsenal to deter any adversary, and guarantee that defense to our allies.”<sup>32</sup>

### **A Trajectory to a U.S. Minimum Deterrence Arsenal**

A number of nuclear weapons states have already enacted minimum deterrence strategies, and in doing so have assessed ‘how much is enough?’ with respect to arsenal size. Their results denote capability requirements that are an order of magnitude less than those of the U.S. and Russia.<sup>33</sup> The U.S. stockpile peaked at 31,000 in 1967, and remained at 5,000 in 2010.<sup>34</sup> Russia’s arsenal peaked at 45,000 in 1986, and remained at 12,000 in 2010.<sup>35</sup> In contrast, none of the five smaller nuclear-armed states has ever had an arsenal in excess of 550.<sup>36</sup>

A partial explanation for why both the U.S. and Russia determine their requirement for nuclear weapons to be at such a high level may lie in their commitment to doctrines of ‘counter-force’, reinforced in the U.S. case by a perceived need to reassure exposed allies.<sup>37</sup> In part, large arsenals are a legacy of the era of ‘massive retaliation’...and of the decision to create a ‘triad’...any element of which met high assured destruction requirements. Strong vested interests—scientific, industrial and military—have played a role in delaying post-Cold War adjustment to lower force levels. The practicalities of dismantlement have been important, slowing the pace at which retired and reserved weapons can be removed from the total warhead count.<sup>38</sup>

[It is] hard to avoid the conclusion that an important role has also been played by the very nature of an arms-control process...a process makes it more difficult to make reductions beyond those agreed in negotiations, irrespective of any operational value...it strengthens the tendency to define required capabilities in relation to those of others, rather than against assured destruction criteria.<sup>39</sup>

<sup>30</sup> Sauer, “Second Nuclear Revolution,” 754.

<sup>31</sup> Wilson, “The Winning Weapon?,” 179.

<sup>32</sup> Obama, “Remarks in Prague, Czech Republic,” 3-4.

<sup>33</sup> Chalmers, “Small Nuclear Forces,” 4.

<sup>34</sup> Stewart and Alexander, “Pentagon Chiefs Grilled,” 15 February 2012. The United States said in 2010 that its total nuclear stockpile, including deployed and non-deployed tactical and strategic nuclear weapons was 5,113.

<sup>35</sup> Robert S. Norris and Hans M. Kristensen, “Global Nuclear Weapons Inventories, 1945-2010,” *Bulletin of Atomic Scientists*, (July/August 2010): 78, 82, quoted in Chalmers, “Small Nuclear Forces,” 4.

<sup>36</sup> Chalmers, “Small Nuclear Forces,” 4.

<sup>37</sup> George Perkovich and James Acton, “Abolishing Nuclear Weapons: A Debate,” *Carnegie Endowment for International Peace* (Washington, DC: Carnegie Endowment for International Peace, 2009), 36, quoted in Chalmers, “Small Nuclear Forces,” 8.

<sup>38</sup> Hans M. Kristensen, Federation of American Scientists and Natural Resources Defense Council, presentation to UN panel on nuclear de-alerting, 13 October 2010. Found in *Air Force Magazine*, January 2011, 39, quoted in Chalmers, “Small Nuclear Forces,” 8.

<sup>39</sup> Chalmers, “Small Nuclear Forces,” 8.

In maintaining a trajectory towards the New START-directed numbers, the U.S. and Russian Federation provide a biannual exchange of data. At present, these exchanges indicate a deployed warhead arsenal number of 1,737 (U.S.) and 1,492 (Russia). Additionally, both indicate fielding 812 (U.S.) and 494 (Russia) deployed missiles and bombers with 1,040 (U.S.) and 881 (Russia) non-deployed missiles and bombers.<sup>40</sup> It appears that while neither nation has reached the treaty-directed arsenal levels, the Russian Federation is much closer to attainment.

Following treaty enforcement initiation, the parties have seven years to complete the arsenal reductions. For the U.S. that follows treaty ratification, setting 5 February 2018 as enforcement date.<sup>41</sup> Complementing the treaty's reductions, the 2010 Nuclear Posture Review called for an implementation study to explore further arsenal size reductions. A mid-February 2012 announcement by President Obama's administration suggested the exploration of "possible cuts to the US nuclear arsenal that include a drastic option to reduce the number of warheads by up to 80 percent."<sup>42</sup>

While this figure is a shocking reduction (an 80% reduction of the New START-directed deployed warhead arsenal number would result in retaining 310 warheads), preliminary reviews hint at a range of reductions, to include cutting the arsenal to 1,000 to 1,100 deployed warheads.<sup>43</sup> Other suggestions propose cuts to levels of a 700 to 800-warhead arsenal, with the most dramatically reductions to levels of 300 to 400 warheads.<sup>44</sup> "Slashing the arsenal down to about 300 deployed warheads would represent a dramatic break with American strategy and downsize the atomic force to a level not seen since the 1950s."<sup>45</sup> Of note, these reductions are solely to the deployed warhead arsenal, and have yet to capture the significance these reductions would make to the nuclear enterprise as a whole, to the obligations assumed by the arsenal, and to the potential changes required of U.S. nuclear strategy.

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<sup>40</sup> U.S. Department of State, Office of the Spokesman (2012). "New START Treaty Aggregate Numbers of Strategic Offensive Arms; Fact Sheet April 6, 2012. [Press Release]," retrieved from <http://www.state.gov/documents/organization/178270.pdf> (accessed 22 April 2012).

<sup>41</sup> U.S. Department of State, Office of the Spokesman (2011). "New START Treaty Entry Into Force; Fact Sheet February 5, 2011. [Press Release]," retrieved from <http://www.state.gov/r/pa/prs/ps/2011/02/156037.htm> (accessed 22 April 2012).

<sup>42</sup> Agency France-Presse, "US Eyes Deep Cuts To Nuclear Arsenal: Official," The Economic Times, 16 February 2012, <http://economictimes.indiatimes.com/news/politics/nation/us-eyes-deep-cuts-to-nuclear-arsenal-official/articleshow/11909347.cms>.

<sup>43</sup> Agency France-Presse, "US Eyes Deep Cuts," 16 February 2012.

<sup>44</sup> Agency France-Presse, "US Eyes Deep Cuts," 16 February 2012.

<sup>45</sup> Agency France-Presse, "US Eyes Deep Cuts," 16 February 2012.

## **Pursuing a U.S. Minimum Deterrence Strategy**

### **A Roadmap to Understanding**

Reductions beyond those imposed by the New START treaty may spur a downward slide to an appreciably smaller deployed warhead nuclear arsenal. At some point, either by design or by default, the size of the arsenal will necessitate a change in the U.S. nuclear deterrence strategy from one of at least maximum deterrence to that of minimum deterrence. This change alone may not directly affect U.S. national security. However, by adopting a minimum deterrence strategy (MDS), changes to U.S. nuclear security policies are expected and will have implications for the broader U.S. nuclear enterprise.

At this point, it is a safe assumption that the U.S. is on a path to a reduced nuclear weapons arsenal. Whether driven by unacceptable costs or by a reduced value to national security, President Obama is acting upon his pledge for a world without nuclear weapons. However, as the president promised, as long as nuclear weapons exist, the U.S. will maintain an arsenal. Before reducing the arsenal, policy makers need to appreciate a general understanding of what deterrence is, how it works, when it fails how nations transition to coercion, and how an MDS will maintain a deterrence status quo, preventing the necessary employment of coercive force.

While always appreciating a true MDS, this exploration first reviews how the various nuclear weapons states developed their arsenals along with their deterrence strategies. By studying four MDS-adopting nuclear weapons states (the UK, France, India, and China), a better understanding is gleaned as to how an MDS nation adapts its arsenal and employment capabilities to meet the demands of national security policy. Understanding this point, an examination of each MDS-adopting nation's choices leads to determining how potential adversaries communicate their deterrence messages. Finally, a comparative analysis generates potential policy options for the U.S. adoption of an MDS, along with the highlighting of options gained, retained, truncated or surrendered when making both fiscal and treaty-relevant nuclear weapons arsenal decisions.

### **Research Statement**

The U.S. retains nuclear weapons parity with only one nation, and arguably possesses warfighting primacy when including conventional capabilities alongside its nuclear ones. The 67-year lifespan of nuclear weapons have only seen two wartime uses, with both occurrences at infancy and both delivered by the U.S. While some nations have pursued the acquisition of nuclear weapons, many have not. In one case, a nation built and then voluntarily dismantled them.

Under the veil of its overwhelming conventional forces and non-military influence, the U.S.' need to maintain a superior nuclear weapons arsenal has come under question. With rising sustainment costs, a reduced value in national security, and a president seeking the Pollyannaish pursuit of a world without nuclear weapons, the U.S. nuclear enterprise must accept the upcoming significant reduction in the national nuclear weapons arsenal. In doing so, the arsenal will diminish to a size necessitating the transition to an MDS.

Before doing so, U.S. policy makers must possess a greater understanding of what is minimum deterrence and what may change in the modes of employment of the U.S. nuclear weapons. Therefore, this document seeks to determine that if the U.S. adopts an MDS, what changes to U.S. nuclear deterrence policy will follow from such a decision. The author then postulates that the adoption of an MDS by the U.S. will drive both changes to national nuclear security policy and have implications for the broader U.S. nuclear enterprise. The pursuit begins for determining the appropriate minimum for U.S. nuclear deterrence.



## Chapter 1

### Understanding Deterrence

Attempting to boil down the extensive library of deterrence thought, the following is an introduction to the concepts of deterrence, coercion, and compellence. At its core, deterrence is about maintaining the status quo. Its partner, coercion, is about changing conditions to return to the status quo or to establish a new status quo. A description of their relationship tends to flow from two ascendant schools of thought. The first, espoused by Thomas Schelling, considers deterrence and compellence partners under the umbrella of coercion. The second, forwarded by Robert Pape, drops the umbrella and opposes deterrence to coercion.<sup>1</sup> This author has blended the two, but elected to swap Schelling's compellence and coercion terms. Therefore, the umbrella concept of compellence is composed of deterrence (maintaining the status quo) and coercion (returning to the status quo).<sup>2</sup>

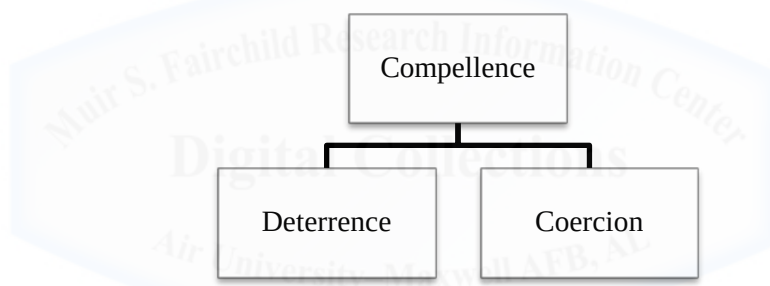


**Figure 1: Relationship between Compellence, Deterrence, and Coercion**

*Source: Author's Original Work*

To understand the considerations for adopting and implementing a U.S. minimum nuclear deterrence strategy, this study needs to lay some groundwork with respect to several deterrence concepts. The first is an exploration of general deterrence and coercion concepts. Following that is an exploration that first isolates on general deterrence and then focuses on the specifics of nuclear deterrence. The focus then tightens to examine specifics of U.S. nuclear deterrence.

<sup>1</sup> Dr. Stephen E. Wright, "Ten Propositions Regarding Extended Nuclear Deterrence" (presentation, 2012 AETC Symposium, San Antonio, TX, 12 January 12, 2012). General Deterrence Concepts.

<sup>2</sup> The umbrella of compellence was chosen based on the definition of compel as "to cause to do or occur by overwhelming pressure." Of its two components, deterrence, based on maintenance and discouragement, is primary. Coercion, based on achievement by force or threat, is therefore secondary. In defining the grey area between discouragement and threat, discouragement shows no change in force posture or alert rates whereas threat does indicate a change to a more aggressive condition. For more, see Merriam-Webster.com Dictionary, s.v. "deterrence," "coercion," "compel," <http://www.merriam-webster.com/> (accessed 1 May 2012).

Extended deterrence necessitates a special exploration, as it has become a unique attribute of U.S. nuclear deterrence policy and strategy. The extended deterrence exploration dovetails into a focus on minimum deterrence. These two concepts (extended deterrence and minimum deterrence) will converge as the concern for retaining the option of extending deterrence to U.S. allies and partners makes an appreciable impact on potential minimum deterrence strategies. This concern, along with a few others, round out the exploration of deterrence concepts in this chapter.

### **General Deterrence and Coercion Concepts**

The working definitions for deterrence and coercion offered in the chapter's introduction were intentionally limited and brief. To appreciate fully minimum nuclear deterrence, one must work to understand compellence through an educational framework examining this concept from a big to small perspective. The first step is to understand the differences between deterrence and coercion. The next is to understand how deterrence relates to the use or possession of force. The final step is to understand how deterrence relates to the use or possession of military-specific forces. Therefore, the beginning requires an expansion of the working definitions for deterrence and coercion.

#### **Definitions**

**Deterrence.** Deterrence is a psychological contract between two parties encompassed by two components: the maintaining of set conditions and a discouragement to act otherwise. Deterrence communications begins with the deterrer stating the preferred or status quo conditions the adversary must maintain. It then states a repercussive action the deterrer will take against the adversary if the adversary deviates from the conditions given. Extracting a portion of Schelling's definition of deterrence, the deterrer is exploiting the potential use of force to persuade the adversary that it is in his own best interest to avoid certain courses of action.<sup>3</sup> In perfect deterrence, there are no deviations and therefore no action needed to enforce the threat by means of coercion. Coercion becomes necessary when the adversary deviates from the given conditions, or when the deterrer wishes to establish a new status quo.

**Coercion.** One condition for effective deterrence is the belief in some probability of discouraged action threat enforcement. This draws from the tenet that deterrence works based on a belief in risk escalation. Once specific 'redlines' are crossed (*i.e.*, deviations from the initial or preferred conditions), the deterrer must take forceful actions either to punish the perpetrator's

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<sup>3</sup> Thomas Schelling defined deterrence as being concerned with the exploitation of *potential* [original emphasis] force, using it to persuade a possible enemy that in his own best interest he should avoid certain courses of action. For more, see Lawrence Freedman, *The Evolution of Nuclear Strategy*, 3rd ed. (Basingstoke: Palgrave Macmillan, 2003), 181-182.

deviations or to reestablish the status quo.<sup>4</sup> These actions, or the threat of conducting them, constitute coercion. To maintain credibility, the deterrer must take these actions if the adversary deviates from the conditions either implicitly or explicitly. Additionally, if the deterrer takes action to establish a new set of status quo conditions, that action is also coercion. To reassure the adversary that seizing prizes seem like a bad idea, deterrence relies on the enforcement of the threat to inflict pain through coercive acts.<sup>5</sup> As the value an adversary places on a prize increases, so too must the coercive pain for deviating from the initial conditions.<sup>6</sup>

While Figure 1 depicts deterrence and coercion isolated from each other, this idea is not quite a complete depiction. The graphic shows the two components of the umbrella concept, not their interrelation. Ideal conditions would allow participating parties to enter into a deterrence contract, and if broken, the deterrer would conduct coercive actions against the perpetrator. However, the ideal sometimes fails to fit the context. There are situations where coercion requires changing present conditions to establish a new status quo and then institute or reestablish a deterrence contract.<sup>7</sup> Interactions between participants can begin in coercion, transition to deterrence, deviate from the deterrence status quo, coerce to a new status quo, and establish a new deterrence contract. This is why compellence is inclusive of both components, yet is not prescriptive in their interrelations.

**Compellence.** Perceptions are key to compellence.<sup>8</sup> They reside in the mind of the adversary.<sup>9</sup> The ‘science’ of deterrence is not simply a condition of the physical. Rather, it is a psychological art involving a shifting mosaic of adversary decision makers, circumstances, uncertainty, and error.<sup>10</sup> Deterrence’s strength lies in not requiring a transition to coercion for enforcement of the consequences or penalties associated with the discouraged action. For example, in parenting, the performing or not performing of certain actions by a child is discouraged (deterrence), and the accompanying threat to the child for deviating from those

<sup>4</sup> The parties in a deterrence relationship are the deterrer and the adversary. In a coercion relationship, they become the deterrer and the perpetrator. The transition from adversary to perpetrator occurs when a redline is crossed and a threat must be reinforced.

<sup>5</sup> Hans M. Kristensen, Robert S. Norris, and Ivan Oelrich, *From Counterforce to Minimal Deterrence: A New Nuclear Policy on the Path Toward Eliminating Nuclear Weapons*, Occasional Paper No. 7 (Washington, DC: Federation of American Scientists/The Natural Resources Defense Council, 2009), 18.

<sup>6</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 18. If the perpetrator values that prize as supreme, then the threat consequence must match and the pain of violating the threat total.

<sup>7</sup> For example, the 1991 Persian Gulf War required coercive actions to remove the Iraqi forces from Kuwait and then established deterrence conditions to maintain those forces out of Kuwait.

<sup>8</sup> Keith B. Payne, “On Nuclear Deterrence and Assurance,” *Strategic Studies Quarterly* 3, no. 1 (Spring 2009): 59.

<sup>9</sup> James Blackwell, “Deterrence at the Operational Level of War,” *Strategic Studies Quarterly* 5, no. 2 (Summer 2011): 35.

<sup>10</sup> Keith B. Payne, “Maintaining Flexible and Resilient Capabilities for Nuclear Deterrence,” *Strategic Studies Quarterly* 5, no. 2 (Summer 2011): 14.

actions (coercion) is the ceased distribution of an allowance (coercion).<sup>11</sup> When academics, economists, and political scientists enter compellence discussions, the simple bipolar allowance example expands to a cost-benefit calculation leading to an understanding that any potential gain achieved from the deterred action will not be worth the effort if aforementioned redlines are crossed. Therefore, the compellence psychological equation includes the capability for the deterrer to respond in accordance with the communicated threat, their willingness to do so, and the adversary's perception of those two.<sup>12</sup>

**Credibility.** The deterrer's capability and willingness to enforce combine to form deterrent credibility, a quality requiring communication to and appreciation by the adversary. A communicated and appreciated credible threat is part of the contract of deterrence. Freedman argues that the principle of manipulating an adversary's behavior through threats is inherent to deterrence, and that manipulation requires the exploitation of potential (deterrence) or consequently actual (coercion) use of force.<sup>13</sup> In disagreement, or maybe as clarification, it is the credibility of enforcing the coercive threat that the compeller uses to manipulate an adversary's behavior. This credibility is required for effective deterrence, and ideally negates any requirement to manipulate the perpetrator when they conduct discouraged acts. The key characteristic is the recognition by the adversary of the deterrer's capabilities.<sup>14</sup> In other words, deterrence works only when your opponent knows something about the weapons with which you are threatening him.<sup>15</sup>

### **Deterrence, Coercion and the Use of Force**

In determining if deterrence is working, one must return to the discussion that deterrence is not physical, but rather psychological. In executing deterrence strategies, the contract becomes tacit while relying on reassurances of action.<sup>16</sup> The first reassurance is that if the adversary does not cross the perceived or articulated redlines, the deterrer will take no action, and the status quo will remain. In the second case, if said redlines are crossed, the adversary becomes a perpetrator,

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<sup>11</sup> Dr. Lani Kass, "DoD Budget Austerity and the New Strategic Guidance" (address, Rethinking National Security in an Era of Declining Budgets Seminar Series, Arlington, VA, 11 January 2012).

<sup>12</sup> Kass, "DoD Budget Austerity," 11 January 2012.

<sup>13</sup> Freedman, *The Evolution of Nuclear Strategy*, 82.

<sup>14</sup> While weapons knowledge is important, an understanding of the irresistible hurt to an adversary's social and economic structure (*i.e.*, targeting) due to a deterrer's punitive actions closes the discourse on a deterrer's credibility. Freedman, *The Evolution of Nuclear Strategy*, 181.

<sup>15</sup> Rajesh M. Basrur, Michael D. Cohen, and Ward Wilson, "Do Small Arsenals Deter?," *International Security* 32, no. 3 (Winter 2007/08): 211.

<sup>16</sup> Caitlin Talmadge, "Deterring a Nuclear 9/11," *The Washington Quarterly* 30, no. 2 (Spring 2007): 22.

and the deterrer is contractually obligated to respond, most likely via actions that hold to the most fundamental tenet of deterrence – by taking action against whatever the perpetrator values.<sup>17</sup>

A deterrer's threats traditionally occur in two ways: punishment or denial. Punishment threatens to impose costs on the perpetrator following the commitment of a proscribed action; denial threatens to reduce the benefits that a perpetrator could expect to gain from committing a proscribed action.<sup>18</sup> Denial capabilities work through influencing the adversary's estimate of the probability of gaining the desired objective.<sup>19</sup> Punishment capabilities influence the estimate of possible costs, and might have little effect on the chance of gaining the desired objective.<sup>20</sup> As long as the compellence acts remain psychological and not physical, influence becomes the means used to return the situation to the previous status quo condition.<sup>21</sup>

The threats or acts of coercion are only executed when an articulated redline is crossed. That crossing indicates that deterrence has failed, highlighting one of the challenges to executing a deterrence strategy—the lack of a positive indicator that the employed deterrence strategy is working.<sup>22</sup> Therefore, the perceptive strategist must always envisage the possibility of deterrence failing.<sup>23</sup> The fact is that deterrence can fail; and when it does, a deterrer desiring to maintain credibility must escalate and take forceful action.<sup>24</sup>

<sup>17</sup> Robert P. Haffa, Jr., Ravi R. Hichkad, Dana J. Johnson, and Philip W. Pratt, *Deterrence and Defense in "The Second Nuclear Age,"* Analysis Center Papers (Los Angeles, CA: Northrop Grumman Corporation, March 2009), 20.

<sup>18</sup> Typically, the U.S. government regards denying benefits or imposing costs as a coercive threat. Denying benefits involves convincing adversary decision-makers that the benefits they perceive are of little value and/or are unlikely achievable by taking the actions the deterrer seeks to deter. Cost imposition involves convincing adversary decision-makers that the costs incurred in response to, or as a result of, their attack will be both severe and highly likely to occur. For more, see Department of Defense, *Deterrence Operations, Joint Operating Concept*, (Washington, DC: Department of Defense, December 2006), 26-27.

<sup>19</sup> Freedman, *The Evolution of Nuclear Strategy*, 107.

<sup>20</sup> Freedman, *The Evolution of Nuclear Strategy*, 107.

<sup>21</sup> Some discussions on the coercive threats of punishment and denial lead to the idea of graduated deterrence. The main proposition of graduated deterrence is that the punishment should fit the crime. In action, graduated deterrence conducts economy of force operations concentrated on military rather than civilian targets. This is not to say that strikes against military facilities would not hurt, just more morally appropriate. One additional aspect of graduate deterrence was the belief that it would hold greater credibility over the suicidal exploits of massive retaliation. Freedman, *The Evolution of Nuclear Strategy*, 107-108.

<sup>22</sup> "Measured only in the breach, crossed redlines indicates that deterrence has failed." Kass, "DoD Budget Austerity," 11 January 2012.

<sup>23</sup> Bernard Brodie, *Strategy in the Missile Age*, New RAND ed. (Santa Monica, CA: Rand Publishing, 2007), 292.

<sup>24</sup> "The risk of escalation has to exist if deterrence is to be operative. But if one sets aside the Cuban Missile Crisis (1962) for the Soviet Union and perhaps, to some extent, the Yom Kippur War (1973) for Israel, there does not seem to be any example when nuclear weapons have been really "close" to being employed." Bruno Tertrais, "In Defense of Deterrence: The Relevance, Morality and Cost-Effectiveness of Nuclear Weapons," *Proliferation Papers*, no. 39 (Fall 2011): 27.

## Deterrence, Coercion and the Use of Military Force

Written in the heart of the Cold War (1966), Thomas Schelling's definition of deterrence contained in *Arms and Influence* does not overtly state that force be provided through military action.<sup>25</sup> The implication by context (*i.e.*, the Cold War) was for the military to provide that force, mainly through the employment of nuclear weapons. In isolation, deterrence remains about creating the fear of consequences.<sup>26</sup> Amended by context, a military power response enforces those consequences. Today, the application of deterrent military power is to a vastly different world than the one that highlighted the concept.<sup>27</sup> Regardless of era, the military powers for deterrence must align with the policies and strategies directed by the statesmen.

Aligning with Schelling's definition in exploiting possible force for persuading the enemy, the U.S. Department of Defense (DoD) defines deterrence as holding a credible threat to prevent action or the belief that the cost of action outweighs any perceived benefits.<sup>28</sup> The basis for effective military deterrence is capability, credibility, and communications. In the event of failed deterrence resulting in the transition to coercion, the military must ensure conditions are set for joint operations (*i.e.*, the imposition of consequences).<sup>29</sup>

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<sup>25</sup> "[Deterrence is]...the threat intended to keep an adversary from doing something." Thomas C. Schelling, *Arms and Influence: With a New Preface and Afterward* (The Henry L. Stimson Lectures Series) (New Haven, CT: Yale University Press, 2008), 69. For more, see Footnote 3, this chapter. "In a deterrent relationship, one or both parties seek to persuade the other to refrain from harmful or dangerous actions by threatening or promising the other nation that the costs of acting will far outweigh the benefits...threatening to impose high costs...threatening to deny the benefits...promising to withhold the costs...in spite of the common shorthand of the Cold War era, deterrence and the threat of nuclear destruction [original emphasis] are not interchangeable concepts." Amy F. Woolf, *Nuclear Weapons in U.S. National Security Policy: Past, Present, and Prospects*, Prepared for Members and Committees of Congress (Washington, DC: Congressional Research Service, updated 28 January 2008), CRS 5.

<sup>26</sup> Blackwell, "Deterrence at Operational Level," 31.

<sup>27</sup> Blackwell, "Deterrence at Operational Level," 31.

<sup>28</sup> "deterrence — The prevention of action by the existence of a credible threat of unacceptable counteraction and/or belief that the cost of action outweighs the perceived benefits." Department of Defense, "Joint Publication 1-02," Department of Defense Dictionary of Military and Associated Terms, 8 November 2010 (As Amended Through 15 November 2011), 98.

<sup>29</sup> Deterrence (1) Deterrence prevents adversary action through the presentation of a credible threat of counteraction. In both peace and war, the Armed Forces of the United States help to deter adversaries from using violence to reach their aims. Deterrence stems from an adversary's belief that a credible threat of retaliation exists, the contemplated action cannot succeed, or the costs outweigh the perceived benefits of acting. Thus, a potential aggressor chooses not to act for fear of failure, cost, or consequences. Ideally, deterrent forces should be able to conduct decisive operations immediately. However, if committed forces lack the combat power to conduct decisive operations, they conduct defensive operations while additional forces deploy. Effective deterrence requires a security cooperation plan that emphasizes the willingness of the US to employ forces in defense of its interests. Various joint operations (such as show of force and enforcement of sanctions) support deterrence by demonstrating national resolve and willingness to use force when necessary. Others (such as nation assistance and FHA) support deterrence by enhancing a climate of peaceful cooperation, thus promoting stability. Joint actions such as nation assistance, antiterrorism, DOD support to counterdrug (CD) operations, show of force operations, and arms control are

The DoD appreciates the preemptive nature of deterrence, and that it encompasses actions and communications that indicate the intent to execute operations. Key to that indication is the requirement for planning punishment or denial actions in the event failed deterrence. One designs deterrence responses to coerce the perpetrator in order to force a return to the status quo ante, not necessarily to fight (and ideally win) a war. This dichotomy, the confusion between the capacity to deter and the capacity to win a war, drives many to continue the Cold War thinking of possessing a nuclear arsenal capable of “winning” a nuclear war.<sup>30</sup> To avoid this dilemma, the DoD must continue to maintain an arsenal that communicates to U.S. adversaries that it is not in their best interests to pursue engaging in a state of war.

It should be obvious that the deterrence relationship is a fundamental and enduring component of national security; deterrence failure would constitute a critical risk, and therefore requires its optimal maintenance.<sup>31</sup> U.S. deterrence requires the ability to maintain the use of force.<sup>32</sup> To achieve the necessary psychological effects and political objectives of deterring opponents and reassuring allies, geopolitical conditions require U.S. deterrence to maintain a visible and credible nuclear capability.<sup>33</sup> In an odd antithetical, “[T]he strategy of deterrence...embraces the preparations for the total war that may come,” while the stability it achieves through the belief “that the strategic advantage of striking first is overshadowed by the tremendous costs of doing so.”<sup>34</sup> The military aspects of deterrence boil down to preparing for and possessing a force capable of inflicting the consequences for executed coercion at a cost so significant to the perpetrator that it makes a breach of deterrence arguably both impractical and unpalatable.

### **Nuclear Deterrence Specifics**

*Nuclear weapons are uniquely effective for deterrence because they are enormously destructive and can be delivered in swift retaliation.*

– Group Captain Tim D. Q. Below  
Royal Air Force

### **Nuclear Weapons Redefine Deterrence**

“The heart of the problem is how to deter attack. This, we believe, requires that a potential aggressor be left in no doubt that he would be certain to suffer damage outweighing any

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applied to meet military engagement, security cooperation, and deterrence objectives. Department of Defense, “Joint Publication 3-0,” Joint Operations, 1 August 2011, V-10 and V-11.

<sup>30</sup> Brodie, *Strategy in the Missile Age*, 274.

<sup>31</sup> Air Force Doctrine Document (AFDD) 3-72, Nuclear Operations, 7 May 2009 (Incorporating Change 2, 14 December 2011), 98.

<sup>32</sup> AFDD 3-72, Nuclear Operations, 98.

<sup>33</sup> AFDD 3-72, Nuclear Operations, 98.

<sup>34</sup> Brodie, *Strategy in the Missile Age*, 402 and 303.

possible gains from aggression.”<sup>35</sup> John Foster Dulles’ statements address the cost-benefit calculation an adversary must make when understanding the capacity of his deterrer to retaliate.

From Dulles’ days onward, the term deterrence gained a new connotation, one with a distinction linking nuclear weapons with the “strategy of deterrence.”<sup>36</sup> Schelling too realized that the strategy of [nuclear] deterrence “would have to be based on the essential properties of nuclear weapons (their power to cause immense pain and destruction) rather than on properties more relevant to previous generations of weapons.”<sup>37</sup> While under general, non-nuclear deterrence, a perpetrator may be willing to accept the consequences of defying the deterrence relationship. Now under nuclear deterrence, the deterrer relied on the adversary not defying the relationship due to the mere presence of the deterrer’s nuclear weapons.<sup>38</sup> Nuclear deterrence strategy remained psychological, and was “produced by ‘the combined effect of a *calculation* of risk incurred compared to the issue at stake and of the *fear* engendered by the risks and uncertainties of conflict’.”<sup>39</sup> While adding nuclear weapons to the mix left deterrence theory unchanged, the pain of failed deterrence consequences changed by orders of magnitude.

Successful credibility leads to a fundamental paradox of coupling nuclear weapons and deterrence – the weapons exist under idealistic conditions of nonuse.<sup>40</sup> To reinforce the paradox, or rather, to ensure its truth, “[T]he most appropriate device for deterring the employment of atomic weapons by one state was the threat of counter-employment.”<sup>41</sup> Reprisal, in kind, blunts the credibility of nuclear weapons as a single-sided consequence expression means. Therefore, nuclear weapons gained their deterrent effect not through a capacity to redress consequence imbalances (*i.e.*, military force and their arsenals), but because of their destructive capacity. Their incredible power to hurt drove nuclear weapons to serve only as a potential, as a threat. That threat, rooted in credibility, gained attention if it was either (a) not matched by a counterthreat [*sic*], which disappeared between the U.S. and U.S.S.R., or (b) was automatically implemented if (a) was not obtained.<sup>42</sup>

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<sup>35</sup> Freedman, *The Evolution of Nuclear Strategy*, 82.

<sup>36</sup> Brodie, *Strategy in the Missile Age*, 271.

<sup>37</sup> Freedman, *The Evolution of Nuclear Strategy*, 181-182.

<sup>38</sup> The strategy depended on manipulating the enemy’s sense of this risk, by ‘the non-employment of nuclear weapons through judicious exploitation of the fact that they exist’. Freedman, *The Evolution of Nuclear Strategy*, 303.

<sup>39</sup> Freedman, *The Evolution of Nuclear Strategy*, 303.

<sup>40</sup> Blackwell, “Deterrence at Operational Level,” 31.

<sup>41</sup> Freedman, *The Evolution of Nuclear Strategy*, 37.

<sup>42</sup> Lawrence Freedman, “The First Two Generations of Nuclear Strategists,” in *Makers of Modern Strategy: from Machiavelli to the Nuclear Age*, ed. Peter Paret, Gordon A. Craig, & Felix Gilbert (Princeton, NJ: Princeton University Press, 1986), 765.

Deterrence held because of this counter-employment reprisal; that reprisal necessitated a second-strike capability.<sup>43</sup> The second-strike capability provided a means of nuclear retaliation, giving the perpetrator the ability to respond to punishment in the event of deterrence failure and coercive correction.<sup>44</sup> Again, the value of nuclear weapons to deterrence is not their ability to affect coercive punishment (reach specific initial or retaliatory targets); it is their incredible destructive power and the psychological toll emplaced on statements by the mere prospect of the punishment they are able to deliver.<sup>45</sup> While the fear of reprisal is not new to human warfare, the level of potential destruction realized by nuclear weapons has held nuclear deterrence in a state of status quo.<sup>46</sup>

### **Nuclear Deterrence Provides Stability**

The assumed nuclear status quo has held since 9 August 1945, or more appropriately, since 1949 following the Soviet's first nuclear detonation. As the number of nuclear weapons states grows, we can make several claims about the stability that nuclear deterrence provides. First, there has never been a direct military conflict between two nuclear states.<sup>47</sup> Second, there have been no invasions of any nuclear-armed country.<sup>48</sup> Third, no nuclear state has ever been the victim of a chemical or biological weapons attack.<sup>49</sup> Additionally, the maintaining of a secure second-strike retaliatory force rather than one that is insecure and vulnerable also is more conducive to crisis stability.<sup>50</sup>

One must concede that the costs and risks associated with nuclear deterrence are high, but require measurement in comparison with possible alternatives. For an equivalent effect, the financial costs of conventional weapons are extraordinarily more.<sup>51</sup> Additionally, conventional force reprisal as a substitute for nuclear forces relies largely on the threat of targeted strikes on

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<sup>43</sup> James Wood Forsyth Jr., Colonel B. Chance Saltzman, and Gary Schaub Jr., "Minimum Deterrence and its Critics," *Strategic Studies Quarterly* 4, no. 4 (Winter 2010): 6-7.

<sup>44</sup> Tertrais, "In Defense of Deterrence," 7.

<sup>45</sup> Forsyth et al., "Minimum Deterrence," 5.

<sup>46</sup> It was the fear of reprisals that encourages restraint over the use of gas during World War II. Freedman, *The Evolution of Nuclear Strategy*, 38.

<sup>47</sup> With the possible exception of the Kargil conflict [May through July 1999, between India and Pakistan in the Kargil district of Kashmir], the intensity and scope were however limited. The only instance when U.S. and Soviet forces clashed directly was the 1950-1953 Korean war, but Soviet pilots were flying under North Korean or Chinese colors. Tertrais argues that the possession of nuclear weapons by both states significantly reduced the likelihood of war between them. Tertrais, "In Defense of Deterrence," 9.

<sup>48</sup> Tertrais, "In Defense of Deterrence," 10.

<sup>49</sup> Tertrais, "In Defense of Deterrence," 13.

<sup>50</sup> States with vulnerable nuclear forces may be tempted to launch their forces on warning (LOW) or launch under attack (LUA), and this could put a hair trigger on these weapons to prevent their being destroyed by surprise attack. The Chinese seem to have solved this "use or lose" dilemma by deploying nuclear arms underground. Col David J. Baylor, "Considerations for a US Nuclear Force Structure below a 1,000-Warhead Limit," *Strategic Studies Quarterly* 5, no. 2 (Summer 2011): 56.

<sup>51</sup> Tertrais, "In Defense of Deterrence," 30.

key assets and centers of gravity.<sup>52</sup> Ultimately, the maintenance of the nuclear status quo relies on the absolute inability of deterrence failures.<sup>53</sup> Thus, in order to leverage this cost advantage at the high end of national survival, the state must maintain the nuclear arsenal as a credible deterrent component of its national security strategy.

### **U.S. Nuclear Deterrence Specifics**

The U.S. nuclear deterrence strategy is not significantly different from other nations. The U.S. possesses nuclear weapons and includes them in its deterrence strategy as a means of self-protection. There are, however, two unique aspects of the U.S. deterrence strategy. The first is its extension of deterrence, and subsequent coercion, to friendly allies and partners. The second is that its strategy has changed over the course time. As U.S. and Soviet arsenals rose and fell, their respective deterrence and coercion strategies changed. This is unique relative to the other nuclear weapons states because they can ill afford to first produce and later dismantle hundreds, if not thousands of warheads. These two unique qualities require additional examination in order to understand the contribution the U.S. nuclear arsenal makes to deterrence strategy.

### **The Role of U.S. Nuclear Weapons**

**Deterrence.** “The fundamental role of U.S. nuclear weapons, which will continue as long as nuclear weapons exist, is to deter nuclear attack on the United States, our allies, and partners.”<sup>54</sup> While not singular in providing national security via deterrence, U.S. nuclear capabilities underpin all other elements of deterrence.<sup>55</sup> The U.S. nuclear arsenal’s fundamental purpose is to deter adversaries from attacking the U.S. and its interests with either their nuclear arsenals, or other forms of weapons of mass destruction (WMD).<sup>56</sup>

In addition to the fundamental purpose, several adjacent purposes highlight nuclear weapons play in U.S. deterrence strategy. DoD officials find value in their ability to threaten to

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<sup>52</sup> Tertrais, “In Defense of Deterrence,” 30.

<sup>53</sup> In a conflict situation, once deterrence has failed, lesser nuclear states’ incentives are to use nuclear weapons first, before greater and medium powers remove them by other means. Once such an adversary initiates use of nuclear weapons, it is not likely to be restrained from further use of a limited arsenal, since there will be enormous pressure to use them or lose them. Blackwell, “Deterrence at Operational Level,” 33-34.

<sup>54</sup> Department of Defense, Nuclear Posture Review Report, Recurring NPR (Washington, DC: Department of Defense, April 2010), vii.

<sup>55</sup> AFDD 3-72, Nuclear Operations, 98.

<sup>56</sup> “The fundamental purpose of the US nuclear arsenal is to deter adversaries from attacking the US and its interests with their nuclear arsenals or other WMD; dissuade competitors from developing WMD; and assure allies and partners of the US’ ability and determination to protect them. Additionally, our nuclear forces assure allies of our continuing commitment to their security, dissuade potential adversaries from embarking on programs or activities that could threaten our vital interests, and defeat threats that are not deterred.” AFDD 3-72, Nuclear Operations, 98.

impose costs and deny benefits to an adversary in an exceedingly rapid and devastating manner.<sup>57</sup> Policymakers argue that nuclear weapons remain the only weapons in the U.S. arsenal that can hold at risk the full range of targets valued by an adversary. As a result, “they provide credible capabilities to deter a wide range of threats, including weapons of mass destruction and large-scale conventional military force.”<sup>58</sup> Former senior defense officials add that they provide an ability to prevent defeat in a conventional war and deter conventional war between major powers.<sup>59</sup> Additionally, those same officials add that nuclear weapons guard against blackmail by other nuclear-armed states and help preserve U.S. military capability to project power.<sup>60</sup> Finally, the U.S. strategy incorporates several additional objectives in its nuclear deterrent including efforts to deter state-sponsored acts of nuclear terrorism, dissuade other major powers from engaging in arms competition, prevent nuclear proliferation by reassuring allies through extended deterrence commitments, and provide a general ‘insurance’ against future strategic threats to a range of ‘vital interests’.<sup>61</sup>

**Coercion.** If forced to project coercive power, the most striking contribution nuclear weapons make is to provide the president with the ultimate means to terminate conflict promptly on terms favorable to the U.S.<sup>62</sup> This requires effort be expended to ensure the security of the U.S.’ retaliatory force.<sup>63</sup> Without a secure strike force, the credibility of the U.S. nuclear arsenal and its deterrence measures come into question.

**Extended Deterrence.** A unique aspect of U.S. nuclear deterrence is its growth beyond organic national security. For those allies and partners who have requested protection under the umbrella of U.S. compellence, the U.S. nuclear arsenal provides an arguably equivalent deterrence and coercion force. The assurance of allies and partners of the U.S.’ ability and determination to protect them, along with a continuing commitment to their security, is a policy known as extended deterrence. Extended deterrence is a predominantly U.S.-only policy feature,

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<sup>57</sup> Department of Defense, Deterrence Operations, 40.

<sup>58</sup> Amy F. Woolf, Nuclear Weapons in U.S. National Security Policy: Past, Present, and Prospects, Prepared for Members and Committees of Congress (Washington, DC: Congressional Research Service, updated 28 January 2008), CRS 10.

<sup>59</sup> William J. Perry, Brent Scowcroft, and Charles D. Ferguson, U.S. Nuclear Weapons Policy: Independent Task Force Report No. 62, Independent Task Force Report (New York, NY: Council on Foreign Relations, 2009), 14.

<sup>60</sup> Perry et al., U.S. Nuclear Weapons Policy, 14.

<sup>61</sup> Nick Ritchie, “Deterrence Dogma? Challenging the Relevance of British Nuclear Weapons,” International Affairs 85, no. 1 (2009): 83.

<sup>62</sup> Department of Defense, Deterrence Operations, 41.

<sup>63</sup> “Our over-riding interest, for the enhancement of our deterrence posture, is of course in the security of our own retaliatory force.” Brodie, Strategy in the Missile Age, 302.

unique to its nuclear arsenal, with roots in the Cold War but continuing through to today.<sup>64</sup> An understanding of this atypical nuclear deterrence policy is vital in understanding the role U.S. nuclear weapons play globally and the implications reductions in the U.S. arsenal would make. This study discusses this feature at greater length later in this chapter.

### **Past U.S. Nuclear Weapons Strategies**

Arguably, it is impossible to prove that nuclear deterrence worked in maintaining the status quo during the Cold War and beyond; correlation is not causality.<sup>65</sup> What one can observe is that U.S. achieved its deterrence objectives during the Cold War: the Soviets never conducted a nuclear attack on the U.S., there was no consent to nuclear blackmail nor was there an attack on European allies, and there was never a conventional attack in Europe that escalated into nuclear war.<sup>66</sup>

Throughout the Cold War, U.S. nuclear deterrence strategy evolved from massive retaliation to flexible response to mutually assured destruction and beyond. What remained constant during that period was Washington's reliance on its nuclear arsenal to deter not only nuclear strikes, but also to deter the Warsaw Pact's conventional military superiority from attacking Western Europe.<sup>67</sup> It was this nuclear-versus-conventional counter-threat that led Washington to abstain from promises of a 'no-first-use' policy for nuclear weapons. This policy, in effect, communicated to a potential perpetrator that consequences included a nuclear response if the conditions of deterrence failed to keep the peace.

During the 45 years of the Cold War, it was the Soviets and other U.S. opponents that determined the deterrent value of U.S. nuclear weapons. It was their beliefs about threat credibility that mattered, not those of American domestic commentators.<sup>68</sup> As Bernard Brodie commented vis-à-vis the Soviet Union in 1963, "[I]f the opponent is under the 'apparent conviction' that the US nuclear deterrent is credible, 'why should we attempt to shake that conviction?'"<sup>69</sup> It is that uncertainty about the type of response provided, and its timing, that

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<sup>64</sup> "[D]uring the Cold War, nuclear forces...[of] United States were intended to deter...Soviet conventional attacks on NATO Europe, Japan, and South Korea, by threatening nuclear damage to the Soviet Union as the likely response." Kristensen et al., *From Counterforce to Minimal Deterrence*, 14.

<sup>65</sup> Tertrais, "In Defense of Deterrence," 9.

<sup>66</sup> Dr. Lewis A. Dunn, "21st Century Deterrence Challenges - Exploring Key Issues, Rethinking Traditional Approaches" (address, Rethinking the Foundations of the Nuclear Security Strategy and the QDR Seminar Series, Arlington, VA, 20 May 2009).

<sup>67</sup> Keir A. Lieber and Daryl G. Press, "The Rise of U.S. Nuclear Primacy," *Foreign Affairs* (March/April 2006), <http://www.foreignaffairs.com/articles/61508/keir-a-lieber-and-daryl-g-press/the-rise-of-us-nuclear-primacy>.

<sup>68</sup> Payne, "On Nuclear Deterrence and Assurance," 61.

<sup>69</sup> Bernard Brodie, "What Price Conventional Capabilities in Europe?," *Reporter* 28 (23 May 1963): 28, quoted in Payne, "On Nuclear Deterrence and Assurance," 50.

arguably made Cold War nuclear deterrence work.<sup>70</sup> The rejection of a “preventive [nuclear] war” forced the embrace of a nuclear deterrence strategy.<sup>71</sup> However, as that strategy changed, the fundamental role of U.S. nuclear weapons did not. The situation now presents a question as to how the strategy must change as the arsenal shrinks while the role remains constant and, especially, U.S. considerations of its extended deterrence options.

### **Extended Deterrence: A Special Aspect of U.S. Nuclear Deterrence**

The objectives of extended deterrence are primarily political and secondarily security. Extended deterrence is primarily a defensive commitment used to strengthen an alliance.<sup>72</sup> Nonproliferation of nuclear weapons or technology is an opportune by-product.<sup>73</sup> Specific U.S. extended deterrence intentions are to “assure our allies that the U.S. nuclear arsenal continues to serve as the ultimate guarantor of their security, thus obviating any need for them to develop nuclear weapons of their own.” The protector and protégé relationship is more effective and less costly for each nation’s collective pursuit of security.<sup>74</sup> A method of making that security economical is by reliance on deterrence power and less on localized defensive power.<sup>75</sup>

### **A Brief History of U.S. Extended Deterrence**

The role of U.S. nuclear weapons expands beyond exclusively U.S. sovereign security; it includes deterring nuclear attack on the allies and partners of the U.S.<sup>76</sup> From a timeline perspective, the notion of the U.S. providing nuclear deterrence had its infancy in post-WWII reconstruction and the Korean War. While much discussion of the U.S. providing a nuclear umbrella focuses on Europe, it is easy to see that parallel coverage guarantees were also occurring in East Asia, specifically to South Korea and Japan. It was with this intention that the Cold War

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<sup>70</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 18.

<sup>71</sup> Brodie, *Strategy in the Missile Age*, 207.

<sup>72</sup> Sr Col Yao Yanzhu, “China’s Perspective on Nuclear Deterrence,” *Air & Space Power Journal* XXIV, no. 1 (Spring 2010): 28.

<sup>73</sup> Kurt M. Campbell, “Nuclear Proliferation beyond Rogues,” *The Washington Quarterly* 26, no. 1 (Winter 2002-03): 15. A discussion by Kurt Campbell in his article titled “Nuclear Proliferation beyond Rogues” lists ten specific reasons that could lead nonnuclear nations to reconsider nonproliferation: U.S. Unilateralism: Internationalist or Isolationist? [potential changes in U.S. policy, both doctrinal and attitudinal]; weakening the taboo against nuclear proliferation; nuclear rogues; escalating rivalries between nuclear and nonnuclear states or territories; conventional force imbalances; an act of cataclysmic terrorism [states might reconsider their nuclear position, viewing nuclear capability as a psychological assurance for its citizens as well as a viable deterrent against external threats, particularly in the face of rogue regimes’ support of non-state actors]; inheritance from sudden regime change [a unified Korean peninsula, South Africa’s transition from white- to black-majority control]; regime pessimism [states in decline suffering from insecurity over future economic and security shortfalls]; domestic political changes in a potential nuclear power; a relatively uncomplicated nuclear history [vowed non-nuclear states with technological capabilities feeling domestic pressure to develop weapons – e.g., Japan, Germany].

<sup>74</sup> Freedman, *The Evolution of Nuclear Strategy*, 81.

<sup>75</sup> Freedman, *The Evolution of Nuclear Strategy*, 81.

<sup>76</sup> Department of Defense, *Nuclear Posture Review Report*, vii.

nuclear forces of the U.S. deterred Soviet conventional attacks on NATO (the North Atlantic Treaty Organization) Europe, Japan, and South Korea by threatening nuclear damage to the Soviet Union.<sup>77</sup> This policy, based on the threat of retaliation, served as the foundation for extended deterrence.

The significance of the U.S.' nuclear protections to Europe serve as a critical influence to the development of American strategic doctrine.<sup>78</sup> While the general concept of a U.S.-provided nuclear umbrella over Europe dates back to late 1940s, obtaining said umbrella was one of the chief motives of the European proponents of NATO.<sup>79</sup> During the period of U.S. nuclear primacy (before the Soviet's 1949 nuclear detonation), a proxy response by U.S. nuclear forces against an aggressive and overwhelming Soviet conventional move served to cultivate the strategy of massive retaliation. While this nuclear threat remained credible for a number of years, Soviet technological advances thwarted it, resulting in the ability of the Soviets to issue a counter-threat in kind. U.S. strategic doctrine evolved and adapted to its primary adversary, yet never failed to provide a credible extended deterrent for the European and Asian alliances and partners.

That deterrent has proven solid gold, for no country covered by a U.S. nuclear guarantee has ever been the target of a major state attack.<sup>80</sup> As part of that guarantee, extended deterrence policy has required the placement of U.S. nuclear weapons within allied and partner territories. While advancing technologies and political sensitivities have allowed the return of those weapons to the mainland-U.S., the guarantee provided by the U.S. to its allies and partners has not waned.<sup>81</sup>

Extended deterrence remains an important pillar of U.S. deterrence policy. However, its application in the context of the 21st century is very different from the Cold War. Today, extended deterrence is less about retaliation and more about posturing to convince an enemy that they are unlikely to achieve the political and military objectives behind any attack on the U.S. or one of its allies.<sup>82</sup>

### **U.S. Extended Deterrence Policy**

The extended deterrence policy of the U.S. is not a passing fad. America has repeatedly reaffirmed its commitment to maintaining extended deterrence protections for its allies and

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<sup>77</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 14.

<sup>78</sup> Freedman, "The First Two Generations," 768.

<sup>79</sup> David S. Yost, "The US Debate on NATO Nuclear Deterrence," *International Affairs* 87, no. 6 (2011): 1402.

<sup>80</sup> Tertrais, "In Defense of Deterrence," 10.

<sup>81</sup> Former South Korean defense ministers asked that US nuclear weapons removed from South Korea in 1991. Payne, "On Nuclear Deterrence and Assurance," 54-55.

<sup>82</sup> AFDD 3-72, *Nuclear Operations*, 2.

partners through both policy speeches and published documents.<sup>83</sup> President Obama's April 2009 Prague speech added his endorsement of a continued extended deterrence policy stating, "As long as these [nuclear] weapons exist, the United States will maintain a safe, secure and effective arsenal to deter any adversary, and guaranteed that defense to our allies."<sup>84</sup>

At present, the United States upholds extended deterrence nuclear protection obligations to 27 members of NATO, along with Israel, Japan, South Korea, and Australia.<sup>85</sup> Specific to NATO, the deployment of nuclear weapons in Europe is an Alliance issue. The spillover of actions concerning NATO's nuclear posture has an impact on the perceptions of the non-alliance allies and partners under the umbrella of extended deterrence.<sup>86</sup> While U.S. messaging and actions may indicate a commitment to allies and partners security, what does or does not assure the allies [and partners] is decided by the allies [and partners] themselves.<sup>87</sup>

**The Assurance of Allies and Partners.** Nuclear weapons appear to have a unique value for assurance. A number of allies are dependent on the U.S. to provide the security of a nuclear umbrella for extended deterrence.<sup>88</sup> That umbrella serves as the ultimate guarantor of their security.<sup>89</sup> Through alliances and treaties, our extended deterrence strategy provides a nuclear umbrella to friendly and allied nations.<sup>90</sup> This umbrella assures the allies of the U.S. commitment to their security and serves as a nonproliferation tool by obviating their need to develop and field their own nuclear arsenals.<sup>91</sup>

While there may seem to be a dichotomy between U.S. insistences on maintaining a nuclear arsenal while actively pursuing nuclear nonproliferation, there certainly is not one. By serving as a responsible provider of extended nuclear deterrence, the U.S. assures its allies and partners and they receive a safe, secure, and effective arsenal to deter any adversary and to

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<sup>83</sup> The fundamental role of U.S. nuclear weapons, which will continue as long as nuclear weapons exist, is to deter nuclear attack on the United States, our allies, and partners [emphasis added]. [Extended deterrence helps to] strengthen regional security architectures and reinforce security commitments to allies and partners by maintaining an effective nuclear umbrella while placing increased reliance on non-nuclear deterrence capabilities (*e.g.*, missile defenses and conventional long-range missiles). Department of Defense, Nuclear Posture Review Report, vii.

<sup>84</sup> Barack H. Obama, "Remarks in Prague, Czech Republic," April 5, 2009, quoted in Yost, "The US Debate," 1413.

<sup>85</sup> Paul Doty, "The Minimum Deterrent and Beyond," *Daedalus* 138, no. 4 (Fall 2009): 137.

<sup>86</sup> AFDD 3-72, Nuclear Operations, 10.

<sup>87</sup> Payne, "On Nuclear Deterrence and Assurance," 56.

<sup>88</sup> Payne, "On Nuclear Deterrence and Assurance," 54.

<sup>89</sup> Group Capt Tim D. Q. Below, "US Nuclear Deterrence: An Opportunity for President Obama to Lead by Example," *Air and Space Power Journal* XXII, no. 4 (Winter 2009): 91.

<sup>90</sup> AFDD 3-72, Nuclear Operations, 3.

<sup>91</sup> AFDD 3-72, Nuclear Operations, 3.

guarantee their defense while reducing the number of nuclear weapons states, providing a desired benefit with regard to in pursuit of nonproliferation goals.<sup>92</sup>

**Extended Deterrence as a Means to Reduce Proliferation.** The offers of U.S. extended nuclear deterrence accepted by allies and partners have strengthened a declining risk for proliferation when those countries face a nuclear threat. In Europe in the late 1940s through the 1960s, several nations (Norway, Germany, and Sweden) expressed interest to develop sovereign nuclear programs, only to abandon their efforts in part due to U.S. commitments to defend the NATO allies by nuclear means.<sup>93</sup>

In Asia, U.S. commitments help dampen the nuclear temptations of Japan, South Korea, and Australia. Specifically, they quelled the possible pursuit of an independent nuclear deterrent by Japan and South Korea as a response to the provocative nuclear activities of North Korea.<sup>94</sup> U.S. Asian allies hold such confidence in the extended deterrence arrangement that they have sought brash statements regarding overt conduct of retaliatory measures by the Americans.<sup>95</sup> While the primary focus of U.S. nuclear deterrence strategy is on defense of sovereign territory, the promise of extended deterrence covers interests that are at times much more important to the protector than non-essential territories.<sup>96</sup> For example, the rising risk of an Iranian nuclear weapon calls once again for a possible extension of a nuclear umbrella to partners in the Middle East.<sup>97</sup>

In the fall of 2009, U.S. Secretary of State Hillary Clinton floated the idea of a nuclear defense umbrella to the members of the Gulf Cooperation Council (GCC; with member states of Saudi Arabia, Kuwait, Bahrain, Qatar, UAE, Oman).<sup>98</sup> While not noted in official administration policy documents, a fundamental purpose of the U.S. nuclear arsenal is to deter adversaries from

<sup>92</sup> Payne, "On Nuclear Deterrence and Assurance," 56.

<sup>93</sup> Tertrais, "In Defense of Deterrence," 14. Note, Sweden remains outside of NATO while retaining strong ties to the U.S. and other western nations.

<sup>94</sup> Haffa, Jr. et al., *Deterrence and Defense*, 16.

<sup>95</sup> A South Korean delegation to the United States sought an explicit public declaration that if North Korea employed nuclear weapons against South Korea, the United States would respond in kind as if the North Koreans had attacked United States itself. Japanese defense minister Fumio Kyuma was explicit regarding the nuclear requirements of extended deterrence. "The strongest deterrence would be when the United States explicitly says, 'If you drop one nuclear bomb on Japan, the United States will retaliate by dropping 10 on you.'" "North Korea's Nuclear Threat/Reinforcing Alliance with US Helps Bolster Nuclear Deterrence," *Daily Yomiuri* (Internet version) in English, 23 March 2007, quoted in Payne, "On Nuclear Deterrence and Assurance," 55.

<sup>96</sup> For instance, during the Cold War, Germany was much more 'vital' to the United States than, say, Puerto Rico. Tertrais, "In Defense of Deterrence," 10.

<sup>97</sup> Matthew Kroenig, "Time to Attack Iran: Why a Strike Is the Least Bad Option," *Foreign Affairs* 91, no. 1 (January/February 2012): 81.

<sup>98</sup> Sabahat Khan, "Nuclear Deterrence For a Nuclear-Armed Iran: The US/GCC Dilemma – Analysis," *Eurasia Review*, January 15, 2012, <http://www.eurasiareview.com/15012012-nuclear-deterrence-for-a-nuclear-armed-iran-the-us-gcc-dilemma-analysis> (accessed 22 January 2012).

attacking U.S. interests. If extended nuclear deterrence were offered to the GCC, it would “serve two core long-term policy objectives for Washington: [F]irstly, to support the security of indispensable energy partners in the GCC, and; [S]econdly, to offer a convincing alternative to GCC states that could consider their own nuclear weapons programs if Iran became a nuclear armed state.”<sup>99</sup> While unique geographically, the extension of a U.S. nuclear deterrent to the GCC would parrot the same actions it performs for current allies and partners: assurance of security and the elimination of potential nuclear proliferation concerns.<sup>100</sup>

**Extended Deterrence Concerns for a U.S. Minimum Deterrence Arsenal.** By suggestion, a sizable reduction in the U.S. nuclear arsenal may bring into question the fundamental role of deterring nuclear attacks against our allies and partners. These protégés may begin to doubt U.S. resolve, shift their alliances, and ultimately begin to discuss launching their own nuclear initiatives.<sup>101</sup> If the U.S. arsenal reaches some small number (as yet undefined), critics contend that it will prevent the U.S.’ ability to extend nuclear deterrence and that U.S. policymakers ought to ask if these alliances are useful.<sup>102</sup> While this argument is thought provoking in the abstract, it is an exercise in futility to examine this disputed point removed from other U.S. policy options.

No one knows how a ‘non-nuclear Cold War’ would have unfolded in Europe. However, without nuclear weapons, Washington might have hesitated to guarantee the security of Europe (“no nukes, no troops”), and might have returned to isolationism; and without US protection, the temptation would have been stronger for Moscow to grab territory in Western Europe.<sup>103</sup> As the U.S. pursues its continued glide-slope towards zero nuclear weapons, it may actually place the nuclear security assurances of European and Asian partners in jeopardy. The pursuit of a minimum deterrence nuclear strategy is likely to minimize further the emphasis of nuclear weapons, and with it, possibly negate the efforts in nuclear nonproliferation that have been guaranteed by the U.S.’ extended deterrence policies.

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<sup>99</sup> Khan, “Nuclear Deterrence,” January 15, 2012.

<sup>100</sup> The mechanism for offering the GCC an extended nuclear deterrence would most likely pattern after that of both European and Asian allies and partners: a credible U.S. “nuclear umbrella” has been provided by a combination of means – the strategic forces of the U.S. Triad, non-strategic nuclear weapons deployed forward in key regions, and U.S.-based nuclear weapons that could be deployed forward quickly to meet regional contingencies. Department of Defense, Nuclear Posture Review Report, xii.

<sup>101</sup> Kroenig, “Time to Attack Iran,” 79.

<sup>102</sup> Forsyth et al., “Minimum Deterrence,” 8.

<sup>103</sup> Tertrais, “In Defense of Deterrence,” 11.

### Minimum Deterrence Defined

*At the end of the Eisenhower administration, U.S. nuclear forces had grown from more than 800 nuclear weapons to more than 18,000. And, despite Ike's preference for the Pampas over thousands of missiles, the air force was pressing the incoming president, John F. Kennedy, for 1,950 new Minuteman missiles. It is in this context that we find the first use of the phrase "minimum deterrence" in an official document, presented as an opportunity to cap the Minuteman force at significantly lower numbers than desired by the air force. Defense Secretary Robert McNamara rejected the strawman strategy, along with a first-strike force. In a 1961 memo, McNamara rejected minimum deterrence on two grounds, both of which would become the canonical arguments against the posture. First, he argued that deterrence in general might fail, and in that case, a large force might limit damage to the United States. This argument receded over time as Soviet capabilities grew and the aspirations of advocates of nuclear "victory" were reduced to "limiting" the number of Americans killed to 20 million or so. Second, McNamara argued that if it adopted minimum deterrence, the United States would be unable to extend its nuclear umbrella to its allies. This argument endured, while damage limitation did not, and to some extent remains part of the nuclear weapons debate today.*

– Jeffrey G. Lewis  
*Minimum Deterrence*

As nations decrease their nuclear arsenals and accompanying stockpiles, upon reaching some lower level, forces either by design or by default a change to employment policies and the adoption of a strategy of minimum (or lesser) deterrence. While most nuclear nations maintain a minimum deterrence policy due to a steadily increasing or stagnant growth in their arsenals, the U.S. and Russia (holding the arsenal and stockpile of the Former Soviet Union) are trending 'backwards' through declining numbers. While the arsenals of both the U.K. and France have decreased since the end of the Cold War, their peak sizes were never remotely close to that of the U.S. and the Soviet Union. Thus the U.K. and France never conducted nuclear deterrence under a strategy of anything other than minimum deterrence. To appreciate deterrence operations under a strategy of minimum deterrence, one must understand first what makes an arsenal qualify as minimum and how that is appreciably different from the arsenals and strategies of the Cold War era.

### Approach Toward a Minimum

If nuclear weapons exist partially to deter against other nuclear weapons, then "basic deterrence" is the art of deterring against a direct, strategic, nuclear attack upon targets within the home territories of a nation.<sup>104</sup> Schelling's perspective on deterrence is painfully absent of comment on superiority of the deterrent force. Prior to the nuclear age, a force clearly inferior to

<sup>104</sup> Brodie, *Strategy in the Missile Age*, 273.

that of an adversary possessed an arguably questionable deterrent value.<sup>105</sup> However, the nuclear age has put that notion under question, for the potential deterrent value of an admittedly inferior nuclear force may be sharply greater than ever before.<sup>106</sup> A single thermonuclear bomb would be a retaliatory force of such capability to give the Soviet government pause; ten such [bombs atop] missiles aimed at ten major cities would be even more effective, and fifty aimed at that number of different cities would no doubt work still greater deterrent effect.<sup>107</sup> Nevertheless, the geometric growth in arsenal size does not equate to an equally grown deterrent threat capability. At some point, “it is a fair surmise that the increase in deterrent effect is less than proportional to the increase in magnitude of potential destruction.”<sup>108</sup>

Acknowledging that both the U.S. and Soviet Union (and now Russia) grew nuclear arsenals of such magnitude that their potential destructive capabilities vastly outstripped their deterrent effect, it is safe to say their arsenal reductions are partially in pursuit of optimizing the necessary destructive force against the policy objectives for their deterrence strategy. One must recognize that the enormous reductions in these two arsenals result from this recognition and the development of more palatable and militarily useful conventional alternatives.<sup>109</sup> The downward-trending reduction in force levels, however, is leading to a zone where the number of weapons might begin to make significant impacts on core deterrent missions.<sup>110</sup> The resulting arsenal size must be of an ‘adequacy’ that meets the political and military-strategic context for potential use. While one does not determine that adequacy by a rigid, formulaic number, it does represent the approach toward a lower boundary referred to as minimum deterrence.<sup>111</sup>

### **Minimum Deterrence Defined**

Bernard Brodie’s analysis offers contrasting insights into the issue of *maximum deterrence* versus minimum deterrence.<sup>112</sup> Maximum deterrence is one “which can be attained by the threat of retaliatory damage [and] must involve a power which guarantees not only vast losses

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<sup>105</sup> Brodie, *Strategy in the Missile Age*, 274.

<sup>106</sup> Brodie, *Strategy in the Missile Age*, 274.

<sup>107</sup> Brodie, *Strategy in the Missile Age*, 275.

<sup>108</sup> Brodie, *Strategy in the Missile Age*, 275.

<sup>109</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 4.

<sup>110</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 3.

<sup>111</sup> Stephen J. Cimbala, “Matrix of Nonlinearity: Minimum Deterrence, Missile Defenses, and Nuclear Arms Reductions,” *Joint Forces Quarterly* 3rd quarter, no. 62 (July 2011): 111.

<sup>112</sup> “Maximum possible deterrence implies the ability to win, in this case, a nuclear conflict. This requires a comparison [original emphasis] in the degree of damage likely to be suffered by each side. To be willing to accept enormous destruction only for the sake of inflicting greater destruction on the enemy (which may be all that some mean by “winning”) argues a kind of desperation at the moment of decision, which rules out reason.” Brodie, *Strategy in the Missile Age*, 279-280.

but also utter defeat.”<sup>113</sup> Brodie offers a contrasting viewpoint in his analysis observing that there exists a condition where considerably less retaliatory destructive force is necessary to achieve “only slightly less” deterrence—a modest retaliatory capability termed “minimum deterrence.”<sup>114</sup> He bounds the capability (arguably arsenal composition) with four qualifying considerations:<sup>115</sup>

- that it may require a large force to guarantee even a modest retaliation,
- deterrence is relative but must be adequate to the motivation which the enemy feels for our destruction,
- if deterrence fails we shall want enough force to fight a total war effectively, and
- the retaliatory force must be first-strike capable and of such caliber to be overwhelming to the enemy’s retaliatory force.

Moreover, while a large force may appear impressive, under some circumstances, the ‘largeness’ of a minimum force may be of importance to deterrence capabilities.<sup>116</sup> Additionally, minimum deterrence seals the lower limits of the arsenal, indicating that any number below this limit would possibly endanger deterrence.<sup>117</sup>

While the composition of a nuclear arsenal, both size and yield equating to deliverable force, may be quantified from large to small, its value to deterrence lies in the nation’s view on the importance of nuclear weapons to national security. This argument holds to five different policies that direct diminishing levels of reliance on nuclear weapons for deterrence credibility: nuclear primacy, maximum deterrence, minimum deterrence, existential deterrence, and post-existential deterrence.<sup>118</sup>

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<sup>113</sup> Brodie, *Strategy in the Missile Age*, 276.

<sup>114</sup> Brodie, *Strategy in the Missile Age*, 276-277.

<sup>115</sup> Brodie, *Strategy in the Missile Age*, 277.

<sup>116</sup> Brodie, *Strategy in the Missile Age*, 277.

<sup>117</sup> Tanvi Kulkarni and Alankrita Sinha, “India’s Credible Minimum Deterrence: A Decade Later,” *IPCS Issue Brief*, no. 179 (December 2011): 4.

<sup>118</sup> Tom Sauer, “A Second Nuclear Revolution: From Nuclear Primacy to Post-Existential Deterrence,” *The Journal of Strategic Studies* 32, no. 5 (October 2009): 745.

Provided below is a brief identification of each along with suggestions for employment options of the respective arsenals:<sup>119</sup>

- Nuclear primacy – possessing the capability to eliminate, via a first strike, the nuclear forces of an enemy. Nuclear primacy provides a large level of national security, and possessing a first-strike capability significantly removes the threat of an enemy first strike while making available the ability to conduct a leading offensive strike.
- Maximum deterrence – this policy emphasizes the role of nuclear weapons. The main characteristic is a force structure, operational and declaratory postures that compensate for the perceived lack of credibility of minimum deterrence. A large nuclear force with a variety of delivery means is kept to hold parity with the adversary. This force should be capable of (or appear to be capable of) conducting a first-strike, specifically against the adversary’s nuclear forces (counterforce) in an effort to blunt the adversary’s second-strike retaliation (damage limitation). Declaratory policies should be ambiguous but that the deterrer is prepared and able to win at every level of escalating violence.
- Minimum deterrence – this policy tries to minimize the emphasis on nuclear weapons. While a secure second-strike capability remains necessary, the reduced quantity of these necessary invulnerable weapons permits a significantly reduced arsenal size.<sup>120</sup> Parity, let alone superiority, is no longer required, so long as the adversary believes that a retaliation of significant destruction remains possible. High alert rates are not necessary with possible exception for the invulnerable retaliatory force. A no first-use policy becomes an option along with the forfeiture of counterforce targeting and massive attacks.
- Existential deterrence – the ability for nuclear weapons to deter thanks simply to their existence, regardless of their posture.<sup>121</sup> While retaliation still holds, the necessity for a prompt reply is no longer necessary. The operation policy to ‘ride

<sup>119</sup> All five policies are derived from Tom Sauer’s article. Sauer, “A Second Nuclear Revolution,” 745.

<sup>120</sup> As far as the medium and small nuclear countries are concerned, after being hit by the first nuclear strike, as long as they still possess the capability of launching the second nuclear strike to inflict unbearable losses to the attacking side, they can still reach a certain kind of strategic balance with major nuclear countries which possess quantitative and qualitative superiority of nuclear weapons. Jeffrey G. Lewis, “Minimum Deterrence,” *Bulletin of the Atomic Scientists* 64, no. 3 (July/August 2008): 12.

<sup>121</sup> Some definitions place existential deterrence as having the weapons placed in an active reserve status, meaning they are available for a return to service over a period of weeks and months. Kristensen et al., *From Counterforce to Minimal Deterrence*, 6.

out’ a strike and then threaten to respond always remains. This policy removes any fear of conducting an offensive first strike.

- Post-existential deterrence – the ability for nuclear deterrence without nuclear weapons. As nuclear weapons can be rebuilt rather quickly in former nuclear weapon states, there is no need to keep the weapons themselves on hand. This policy shifts the deterrent from the state-run military to the industrial sector: ‘factory would deter factory, blueprint would deter blueprint, equation would deter equation’. One could argue that this is a policy of virtual nuclear weapons arsenals, and nations with extensive civilian nuclear programs (*e.g.*, Japan, Germany) already exercise this deterrence policy.

### Minimum Deterrence Refined

When assessing the meaning of *minimum*, the scale required to make such an assessment needs another point for comparison; crudely, minimum as “Compared to what?”<sup>122</sup> For nuclear weapons, that scale falls between nuclear abolition (hard zero) and assured destruction (possessing an overwhelming punishment capability).<sup>123</sup> The assessment of a nuclear strategy, in particular one for minimum deterrence, must address several variables, including: political and military objectives for forces, targeting plans related to retaliatory objectives that may or may not reflect the actual intent of the policymakers, and the arsenal composition and its survivability.<sup>124</sup> Coupled with those assessments are three assumptions: all states strive to survive and that all statesmen want a state to rule, nuclear weapons produce political effects that compel statesmen to behave cautiously in the face of grave danger, and large arsenals buy statesmen little (see the earlier discussion on deterrent effect proportionality).<sup>125</sup> If the policymakers find that they indeed require a nuclear arsenal for state security, but not one of such size that is neither oppressively costly nor geopolitically provocative, then it is plausible that this nation is enacting a minimum nuclear deterrence strategy.

Providing further scope to the size of a minimum deterrence arsenal, a deterrence-only force requires many fewer weapons than does a nuclear “war-fighting” force.<sup>126</sup> Essential to the deterrence-only (minimum) force is the ability to survive an adversary’s surprise attack.

<sup>122</sup> Cimbala, “Matrix of Nonlinearity,” 112.

<sup>123</sup> Cimbala, “Matrix of Nonlinearity,” 112.

<sup>124</sup> Cimbala, “Matrix of Nonlinearity,” 112.

<sup>125</sup> Forsyth et al., “Minimum Deterrence,” 3.

<sup>126</sup> Ivo Daalder and Jan Lodal, “The Logic of Zero: Toward a World Without Nuclear Weapons,” *Foreign Affairs* (November/December 2008), <http://www.foreignaffairs.com/articles/64608/ivo-daalder-and-jan-lodal/the-logic-of-zero>.

Kristensen, Norris and Oelrich elegantly define minimal deterrence through the linking of arsenal survivability with status quo deterrence: “[we must] agree that the last mission of nuclear weapons should be to survive a nuclear attack in order to threaten against a nuclear aggressor, with the aim of deterring such an attack in the first place. We call this the “minimal deterrence” mission.”<sup>127</sup> While counter to present U.S. employment policy, this definition of minimum deterrence clearly indicates that retaliation after a nuclear attack is the only mission for U.S. nuclear forces, and in concert, should apply as well to those non-NATO countries that the United States has expressed a similar commitment to protect.<sup>128</sup>

### **Changes Accompanying a Smaller Arsenal**

Deterrence relies on a threat to use force and it should work reliably because even small numbers of nuclear weapons can pose a fearsome threat.<sup>129</sup> The U.S. Cold War nuclear philosophy centered on the assured elimination of Soviet nuclear forces and infrastructure, embraced most aptly by the concept of massive retaliation.<sup>130</sup> Since its peak in the mid-1960s, the U.S. has reduced its nuclear arsenal, partially under an understanding of the marked difference in the necessary capabilities to conduct nuclear warfighting over war deterring. While the strategic nuclear arsenal of the U.S. following the implementation of the New START Treaty reduced to nearly one-tenth its zenith, the arsenal operates in essentially the same manner and overall structure as it did during the Cold War.

The reason is simple: the basic planning principles for what constitutes a “credible” nuclear war fighting force have not changed.<sup>131</sup> If the U.S. continues to reduce its strategic nuclear arsenal, it may reach a point where an examination of capabilities leads policymakers to view the arsenal as if it were fresh, requiring a (re)learning about its new role. The erudition accrued by the U.S.’ 67 years of nuclear experience will relieve policymakers of needing to develop means of keeping the arsenal safe, secure, and reliable, but will be forced to learn how they intend to employ its capabilities.<sup>132</sup>

### **Concepts and Characteristics Needed to Implement a Minimum Deterrence Strategy (MDS)**

Here starts the march forward in determining what changes to U.S. nuclear security policy follow from the decision to adopt an MDS. The remainder of this chapter introduces several topics that receive greater exploration later in this treatment. The first section looks at when and why nations adopt an MDS. Following that is a brief discussion of nuclear arsenal and

<sup>127</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 4.

<sup>128</sup> Doty, “The Minimum Deterrent and Beyond,” 137.

<sup>129</sup> Payne, “Maintaining Flexible,” 19.

<sup>130</sup> Lieber and Press, “Obama’s Nuclear Upgrade,” 6 July 2011.

<sup>131</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 7.

<sup>132</sup> Blackwell, “Deterrence at Operational Level,” 45.

employment options resulting from the adopted MDS. Next, the study examines deterrence communications, focusing on messaging towards both adversaries and allies or partners. Finally, the chapter concludes with a synopsis of minimum nuclear deterrence and sets the stage for an in-depth exploration of each of these topic areas.

### **When and Why Does a Country Adopt an MDS**

In barbaric realism, the possession of nuclear arsenals beyond some reasonable minimum allows the deterrer to destroy their adversarial perpetrator multiple times over while retaining enough enduring capabilities to meet other deterrence obligations (*e.g.*, extended deterrence) and continue to deter others in pursuit of national survival. To humanize, to rationalize, this argument, there exists the politically attractive promise that deterrence is sure to work at some specific, much lower nuclear force level. This promise is predicated on a universal principle that all statesmen are rational decision makers, and that they will calculate and conciliate predictably.<sup>133</sup> While nuclear ‘overkill’, the ability to destroy society more than once (which somehow was seen to be morally worse than the ability to destroy them just once), seemed outlandish, it sparked the idea to advocate a minimum deterrent – the possession of sufficient nuclear weapons to inflict grievous harm on the enemy in retaliation, but no more.<sup>134</sup>

This true minimum receives criticism for failing to achieve an adequate replacement for maximum deterrence in three areas. First, it did not account for the nuclear firepower that might be ‘lost’ or neutralized in an actual exchange (due to either weapons failures or enemy counter-nuclear defenses).<sup>135</sup> Next, it failed to account for retaining a frightening enough retaliatory threat to keep the adversary cautious.<sup>136</sup> Third, and arguably more a political obligation than a counter to existential threats, a failure to retain enough of an arsenal to provide effective and respected extended deterrence obligations. If these three criticisms are rectified, it reestablishes a

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<sup>133</sup> Payne, “Maintaining Flexible,” 18. When attempting to anticipate a foreign leadership’s decision-making it is important to understand the difference between rational and reasonable behavior. Rationality is a mode of decision-making that logically links desired goals with decisions about how to realize those goals. Reasonable suggests that the observer understands that decision-making and judges it to be sensible based on some shared or understood set of values and standards. Rationality does not imply that the decision-maker’s prioritization of goals and values will be shared or considered “sensible” to any outside observer. Rationality does imply that the decision-maker will link policy choices logically to a particular hierarchy of goals and values. Therefore, deterrence is to work reliably because even small numbers of nuclear weapons can pose a fearsome threat, and leaders will be rational qua reasonable in response. Keith B. Payne, *The Fallacies of Cold War Deterrence and a New Direction*. 1st ed. (Lexington, KY: The University Press of Kentucky, 2001) 7-8.

<sup>134</sup> Freedman, *The Evolution of Nuclear Strategy*, 195. An exemplary nonspecific minimum deterrent set of objectives for targeting: impose unacceptable damage to the attacker’s society and civilian population and/or national infrastructure, although with forces less than those required for assured destruction. Cimballa, “Matrix of Nonlinearity,” 112.

<sup>135</sup> Freedman, *The Evolution of Nuclear Strategy*, 195.

<sup>136</sup> Freedman, *The Evolution of Nuclear Strategy*, 195.

'balance of terror' between adversaries allowing the further exploration of what conditions support a transition to an MDS.<sup>137</sup>

To determine the value of adopting an MDS, policymakers and strategies must compare minimum to the other potential strategies and accompanying arsenal options. Nuclear abolition tends to be of utopian construct, allowing for the realistic alternative of minimum deterrence.<sup>138</sup> Maximum deterrence, and its hulking brother primacy, is exceedingly costly, perhaps prohibitively so. Therefore, minimum deterrence finds acceptance with policymakers wishing to maintain a viable nuclear deterrent at a more acceptable cost. An arsenal designed to support an MDS would be of significantly smaller size compared to that required to achieve an assured destruction response.<sup>139</sup> Cost, policy, and perceived threat converge show how adopting an MDS can be suitable.

### **What Arsenal and Employment Options Result From Adopting an MDS**

**A True Minimum.** The pursuit of a true minimum nuclear arsenal size requires linking two sequential ideas. The first is that minimum deterrence would reserve for the arsenal just one mission: to deter the use of nuclear weapons.<sup>140</sup> The second is that the necessary retaliation requires only enough weapons to inflict unacceptable damage.<sup>141</sup> Therefore, a true MDS has no need for a first-strike capacity, or the capability to attack niche political or military targets (*e.g.*, enemy nuclear forces, hardened facilities, or underground structures). A true MDS no longer requires the need to destroy enemy nuclear forces to achieve advantages during a nuclear exchange. There is no longer a need to "win" a nuclear war or deter attacks from other forms of WMD or conventional forces.<sup>142</sup> A true MDS arsenal lends credence to the concept that nuclear weapons hold as the "instrument of last resort," and thus grants credibility to the statesmen embracing this strategy.<sup>143</sup>

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<sup>137</sup> The balance of terror is anything but delicate. An enemy who can be deterred, will be deterred by the prospect of a counterattack, even if it consists of only a few nuclear weapons. Beyond that minimum threshold, nuclear weapons provide little additional deterrent benefit. This view, which is often referred to as minimum deterrence, is probably the most prevalent view regarding nuclear. In 1960, strategist Herman Kahn, no great fan of what was then called either "minimum" or "finite" deterrence, was tempted to call it the layman's view but resisted, because the "view is held by such a surprisingly large number of experts that it may be gratuitously insulting" to use that description. Lewis, "Minimum Deterrence," 41.

<sup>138</sup> Cimbala, "Matrix of Nonlinearity," 111.

<sup>139</sup> An exemplary nonspecific arsenal would require a number of survivable weapons sufficient to destroy an adversary's major infrastructure and the sinews of their modern national economy, while not necessarily emphasizing the destruction of urban-industrial areas, but also not necessarily guaranteeing "city avoidance." Cimbala, "Matrix of Nonlinearity," 112.

<sup>140</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 21.

<sup>141</sup> Matthew Rendall, "Nuclear Weapons and Intergenerational Exploitation," *Security Studies* 16, no. 4 (October-December 2007): 529.

<sup>142</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 22.

<sup>143</sup> Lieber and Press, "Obama's Nuclear Upgrade," 6 July 2011.

So, in embracing an MDS, what size arsenal constitutes a true minimum? Arguably a one-weapon arsenal – with well-communicated, credible threat possessing secure second-strike characteristics – capable of inflicting enough damage and should provide the adversary with a moment of pause in their calculations of conducting a first-strike. Forsythe, et al., provide a practical perspective in their recommendation maintaining, “several second-strike nuclear weapons are more than enough to keep the most aggressive adversary at bay.”<sup>144</sup> They continue their advice in proffering a U.S.-specific recommendation for an arsenal size when required to deter multiple actors: How many weapons does one need to fight a nuclear war? One possible answer is enough to muster a viable second-strike capability against your most dangerous opponent.<sup>145</sup>

**A Minimum Based on Yield and Not Quantity.** A slightly different take on minimum deterrence arsenals focuses on not only weapon quantity, but also weapon *yield*. If conducting a true MDS strategy highlights the seriously few weapons required, their yield must be of such power to ensure adequacy in the ability to inflict unacceptable damage to the adversary. Parity in numbers (quantity of weapons) would only be a formality, for pragmatism would favor the retention of higher-yield weapons.<sup>146</sup>

Paul Doty offers an argument about arsenal yield totals that truncates to the assumed damage generated by nuclear retaliations is not to exceed that of larger past wars (both world wars and Vietnam). That value is estimated at just fewer than 2 megatons (MT) and thus becomes the maximum yield size for an MDS arsenal. The composition of that arsenal would equate to 133 15-kiloton (kT) weapons, or 20 100 kT weapons, or a whole-number mix of the two.<sup>147</sup> This minimum deterrence arsenal solution blends both utopian ideals of a small quantity arsenal with the realism approach to having a credible adequacy in inflicting enough damage when called upon in retaliation.

**A Realistic MDS Arsenal for the U.S.** While a valiant exercise, strategic arsenals open to international inspection require measurement in terms of quantity, not yield. Additionally, reduction proposals typically cite some round number as their target. While this may seem arbitrary, nuclear weapons reductions carry significant inertia requiring settling periods at various

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<sup>144</sup> Forsyth et al., “Minimum Deterrence,” 7.

<sup>145</sup> “Five warheads could wreck the Boston-Washington or San Diego-San Francisco corridors. Fifteen warheads could kill as many Russians as died in all of World War II.” Radomir Bogdanov and Andrei Kortunov, “On the Balance of Power,” *International Affairs* (Moscow) no. 8 (1989): 9, quoted in Rendall, “Nuclear Weapons,” 551.

<sup>146</sup> Doty, “The Minimum Deterrent and Beyond,” 133.

<sup>147</sup> For more, see Appendix A: “Doty Nuclear Arsenal Reduction Schedule.”

transitional stages on the way to zero.<sup>148</sup> For the U.S., the New START Treaty sets the next transitional stage at 1,550 active warheads. Some argue that number remains excessive, and in line with President Obama's vision, urge for unilateral reductions.

While commanding applause, pursuing force reductions hangs on a muddled definition of minimum deterrence. The missions for potential U.S. nuclear force use should contract to a single one – to retaliate after a nuclear attack on the U.S. or its allies.<sup>149</sup> By now, the muddled view should be obvious: minimum deterrence is for defense of the sovereign nation while extended deterrence adds a politically motivated obligation to the nuclear arsenal. This divergence highlights a significant decision in U.S. policy making with respect to the arsenal size concerning a possible transition to an MDS: does the arsenal need to account for U.S.-only defense retaliations, or must it add (retain) capabilities for extended retaliation on behalf of its allies and partners?

While policymakers will perform double-dip mathematic gymnastics in answering the previous question, several options suggest for base- lining at a lower limit. For nuclear optimism, an arsenal at around 200 warheads should be at least as stable as the status quo.<sup>150</sup> Drawing on Cold War coalition targeting schemes, one model concluded that to destroy 25 percent of the population of Russia, the United States, Britain, France, and Germany would need fewer than 250 large weapons.<sup>151</sup>

In concert with U.S. European allies, ceilings in the low hundreds serve adequately. Today, the powers that subscribe to minimum deterrence keep arsenals ranging from 180 weapons (United Kingdom) to 350 (France).<sup>152</sup> Harold Feiveson and his colleagues, with their recommendation of 200 warheads, validate the European allies' range.<sup>153</sup> While a "war with 200 warheads each could still make World Wars I and II look like tussles in a sandbox," Sagan and Turco conclude that it would risk far less serious climatic consequences.<sup>154</sup> After all the lowball suggestions, most advocates of an MDS see it requiring hundreds, if not thousands of warheads.

### **What Deterrence Messages Require Communicating Resulting From Adopting an MDS**

Unique to the U.S. (and to the Soviet Union but not necessarily Russia) is the communication of deterrence messaging with both the adversary along with the allies and

<sup>148</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 3.

<sup>149</sup> Doty, "The Minimum Deterrent and Beyond," 137.

<sup>150</sup> Rendall, "Nuclear Weapons," 558.

<sup>151</sup> Doty, "The Minimum Deterrent and Beyond," 130.

<sup>152</sup> Sverre Lodgaard, "Toward a Nuclear-Weapons-Free World," *Daedalus* 138, no. 4 (Fall 2009): 147.

<sup>153</sup> Feiveson et al. recommend 200 weapons with an acceptable variation that "could nearly as easily be 400 or 100" quoted in Rendall, "Nuclear Weapons," 558.

<sup>154</sup> Sagan and Turco, *A Path Where No Man Thought*, pp. 229-240; cf. Robock, Oman and Stenchikov, "Nuclear Winter Revisited," 14, quoted in Rendall, "Nuclear Weapons," 558.

partners. The dual nature character of this action is to show strength to both, but for different yet related reasons. Deterrence messages to an adversary of the U.S. (*e.g.*, Russia) requires an understanding that its national sovereignty will not be violated without the repercussions of a nuclear retaliation – a fundamental role of U.S. nuclear weapons is to deter nuclear attacks on the U.S. Similarly, deterrence messages to an adversary of the U.S. requires an understanding that the national sovereignty of our allies and partners will not be violated without the repercussions of a nuclear retaliation provided by the U.S.

While similar to the previous situation, when the U.S. communicates an extended deterrence message to a potential adversary, then it is saying it will provide the protected ally or partner protection of its survival interests with a threat of retaliation if the adversary were to violate ally/partner sovereignty. This third situation is much like an older brother defending a younger sibling to prevent the younger from entering into his or her own fight. Communicating the cost for extending ‘older brother’ deterrence to U.S. allies and partners is by either positively in an increased arsenal size or negatively in a changed national employment policy.

**Messages toward Adversaries.** By adopting a true MDS, the deterrer communicates to the adversary a no-first-use and constrained second-use policy. While this approach may end aggressive nuclear planning, curtail the drive for continued modernization, and provide a stable interim state on the glide path toward nuclear disarmament, it leaves no ambiguity in the mind of the adversary as to what actions are available for response to redline breaches.<sup>155</sup> To add fuel to the fire, there exists an assertion that deterrence may be different with small arsenals, and that the threat of the destruction of one or two cities no longer fazes opponents, making potential redline infractions of greater certainty.<sup>156</sup> A case where this proved untrue was that of Khrushchev-era policies. He stated that the Soviet Union opted for a ‘minimum deterrent’ and that the enemy (*i.e.*, the U.S.) would be deterred by the devastation threatened by the nuclear power becoming available to the Soviet forces.<sup>157</sup>

Arguably, the Khrushchev conditions for minimum deterrence do not match the definition from above regarding a true minimum deterrent. The growth rate of the Soviet arsenal attempted to parallel that of the U.S. throughout much of the Cold War, and while the policy of enforcing an MDS was communicated by the Soviets, in actuality they were not holding to a true MDS. The Soviet embrace of a nuclear strategy beyond a true MDS was overtly communicated by the safeguards that helped the U.S. and Soviet Union avoid a nuclear exchange—secure-second strike

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<sup>155</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 21.

<sup>156</sup> Basur et al., “Do Small Arsenals Deter?,” 202.

<sup>157</sup> Freedman, *The Evolution of Nuclear Strategy*, 248.

capabilities, clear lines of communication, long flight times for ballistic missiles from one country to the other, and experience managing nuclear arsenals.<sup>158</sup>

While a committed deterrence relationship adds to the clarity of communications, some nuclear powers avoid communicating with absolute clarity or explicitly stating response actions to redline provocations. The maintenance of uncertainty in the potential aggressor's mind concerning the timing and size of the retaliation is one key to nuclear deterrence messaging. To that adversary, there is a very large difference if the retaliator delivers ten or a hundred weapons.<sup>159</sup> For a pragmatic U.S. MDS, the avoidance of a true minimum arsenal retains the ambiguity and uncertainty that serve as cornerstones to adversarial deterrence communications.

**Messages toward Allies and Partners.** At present, the U.S. provides an extended nuclear deterrence to over 30 nations. Commentators' most vocal fear of a U.S. MDS adoption is the unwanted encouragement of nuclear proliferation, particularly among America's allies. This fear is rooted in the belief is that unless the U.S. homeland comes under attack, the 'smallness' of the U.S. arsenal would be too valuable to be expended on retaliatory measures on behalf of another nation. The existential threat posed is not to the U.S. but to someone else, someone who until now received a guarantee of protection provided by a U.S. nuclear umbrella. The worst-case proliferation thinking would be for Germany, Japan, and/or Taiwan to become nuclear players to ensure sovereignty under the perception of an uncommitted U.S. extended deterrence retaliatory policy.<sup>160</sup>

Those who accept the premise that the U.S. may reduce its extended deterrence capabilities when adopting an MDS also worry that these conditions may drive non-nuclear states to compete with the U.S. and Russia in terms of arsenal size and capability. While the sizes of these two arsenals are easily multiples larger than the other nuclear weapons states, it is hard to see why their size should matter.<sup>161</sup> Those nations that perceive the need to acquire nuclear weapons for security matters are more interested in a secure second-strike capability and associated deterrence, which makes the acquisition of nuclear weapons more difficult. If some nations seek nuclear weapons for the sense of prestige, then the desire to seek arsenal parity becomes of great concern, especially if the U.S. adopts and implements an MDS due to a downsized arsenal.<sup>162</sup> Therefore, the message communicated by the adoption of a U.S. MDS may require the possible retraction of global security assurances, and force allies and partners to

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<sup>158</sup> Kroenig, "Time to Attack Iran," 80.

<sup>159</sup> Brodie, *Strategy in the Missile Age*, 278.

<sup>160</sup> Rendall, "Nuclear Weapons," 560.

<sup>161</sup> Rendall, "Nuclear Weapons," 556.

<sup>162</sup> Rendall, "Nuclear Weapons," 564.

reconsider their need for the security granted by nuclear deterrence, with a proliferation worst-case outcome of more nations possessing arsenal parity with the U.S. and Russia.<sup>163</sup>

### Conclusions

This chapter began with a definition of a concept composed of three terms. The concept is the geopolitical activities of nations and their actions, reactions, and communications to pressure or compel adversaries to act in certain ways. Compellence is the overarching umbrella for the two general means of pressuring or influencing other nations. The first method is through deterrence. Deterrence communicates conditions for maintenance of a status quo and the use of a threat to discourage changes to those conditions. States use coercion when adversaries violate a status quo, or to change a status quo. In addition to threats, coercion can involve the use of force to change adversary behavior.

Some nations are unable to afford a nuclear arsenal, while others chose choose not to on moral or ideological grounds. Akin to a supply-and-demand transaction, a nation with a nuclear arsenal could offer to provide the coercive threat on behalf of the nation without the arsenal. Extended deterrence is the name for this offer. At present, the U.S. provides nuclear extended deterrence to the other 27 NATO nations, along with Israel, South Korea, Japan, and Australia. Though embraced by the Soviet Union, Russia does not currently provide this capability, thus making extended deterrence a unique option to the U.S. arsenal.

Extended deterrence provides two benefits to the parties involved. The first is psychological. The agreement for extended deterrence protection assures allies and strengthens relationships. Knowing that one nation will come to the aid of another with the most powerful weapons conceived provides great strength in nation-to-nation relations. The second benefit grows derives from the first. Physical in nature, if one nation provides nuclear deterrence for the second, the protégé has no requirement to possess nuclear weapons. The benefit produced is a reduction in potential unwanted nuclear proliferation. While this is not the primary reason for extending and accepting this form of deterrence, it is a welcomed bonus.

Providing extended deterrence infers the protector nation's arsenal possesses some excess capability. That excess indicates the protector is not complying with a true minimum deterrent. The characteristics of a true minimum deterrent emphasize three roles for the nation's nuclear weapon. The first is that the weapon's primary purpose is to deter attacks against the homeland. The second is a reservation on their use for a response to failed deterrence. The interpretation of this point is that these are retaliation-only weapons, and not for initiation of coercion. The third and final characteristic is that the arsenal size (quantity implied, but may extend to cumulative

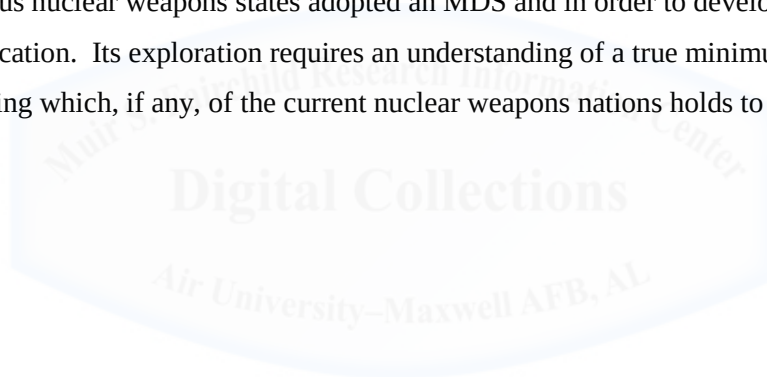
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<sup>163</sup> Lieber and Press, "Obama's Nuclear Upgrade," 6 July 2011.

yield) be only large enough to provide the necessary security. The offer of extended deterrence is in clear violation of all three characteristics, most notably the third for it requires an arsenal size beyond that necessary to provide the deterrer security. Unfortunately, a true minimum deterrent cannot provide extended deterrence.

To account for deviations from theory to reality, this study proposes here a working definition for a minimum nuclear deterrence strategy and the accompanying arsenal required by such a concept. First, the strategy minimizes emphasis on nuclear weapons for national defensive measures. Second, the arsenal's size is only large enough to provide capabilities for ensuring national survival along with an adequate reserve. Third, that arsenal is secure against initial adversarial attacks. Fourth, that arsenal is retaliatory only and is of such capability as to provide an adequate response. This working definition is subjectively close to a true minimum.

As mentioned in the introduction, either by default or by design, continued U.S. strategic nuclear force reductions will drive the adoption of an MDS. The next chapter explores when and why various nuclear weapons states adopted an MDS and in order to develop lessons for potential U.S. application. Its exploration requires an understanding of a true minimum nuclear deterrence in evaluating which, if any, of the current nuclear weapons nations holds to that definition.



## Chapter 2

### Adopting a Minimum Deterrence Strategy

The next three chapters explore lesser nuclear nations' (lesser relative to the U.S. and Soviet Union/Russia) decisions to seek minimum deterrence strategies. The discussion includes an examination of the arsenals, intertwined employment options to enforce a MDS, and how states communicated strategic choices or actions/reactions in the deterrer-adversary/perpetrator relationship. Much of the case study material focuses on four MDS nations: the United Kingdom, France, India, and China. These four represent a set of nations spanning both Eastern and Western deterrence requirements. Additionally, they exhibit how a third party's extended deterrence obligations have influenced strategy adoption and accompanying arsenal structures. Furthermore, they each reflect strategy, policy, and arsenal requirements for deterring more than one adversary.

Arguably, the only bipolar deterrence arrangement between two openly admitted nuclear states is that of Pakistan and India. The remaining states conduct multi-polar arrangements. For example: India and Pakistan, India and China, China and India, China and Russia, China and the U.S., the UK and Russia, the UK and those who might counter NATO.

For all their differences, these four countries have fortunately provided many statements and opinions in open-source documents, many in English, thus making for easier research and comparison. When conditions permitted, additional case study materials from other nations provide corroboration or contradiction to the MDS adoption topic at hand. For example, Pakistan's program is in its (relative) infancy, and remains shrouded in secrecy due to limited press access and the association it maintains with A. Q. Khan and his activities. Where useful, the study incorporates other examples to add context to the discussion. As an example, material from South Africa provides value from the position that they are first and only nation to build nuclear weapons and then voluntarily dismantled them.<sup>1</sup> Discussion material from some states is less useful to the study. For example, Israel has never confirmed its status as a nuclear state and Russia, while not a lesser nuclear power, provides interesting information, however; it is less useful in the development of ideas on the pursuit of an MDS.

Therefore, this chapter serves to explore when and why the four MDS nations (and others as they add to issue context) pursued this strategy. It begins by answering the question of 'How

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<sup>1</sup> Nuclear Threat Initiative, "Country Profiles / South Africa / Nuclear," (last updated: November, 2011), <http://www.nti.org/country-profiles/south-africa/nuclear/> (accessed 17 February 2012).

Much Is Enough?’ This review of the applied constrictions and restrictions explains what dictated the size of each MDS nation’s nuclear arsenal. What follows is an iterative study in the history and decisions driving when and why a nation adopted a MDS. Material on each of the four case study nations provides a brief history of their nuclear pursuits, a survey of how their arsenals evolved over time, and an explanation for their continued retention of their nuclear deterrent forces. The disparate case studies synthesize to an analysis that develops answers to three questions. The first, “When do nations adopt an MDS?” Next, “Why is the strategy adopted?” Lastly, “What sets the size of the arsenal?” The chapter concludes with lessons and suggestions for the U.S. should it choose to adopt an MDS.

### **‘How Much is Enough?’ Sizing a Nuclear Arsenal**

Before reviewing each case study for the particulars on adopting an MDS, one needs to understand why the MDS states’ arsenals are nearly two orders of magnitude smaller than those of the U.S. and Russia (inclusive of the Soviet Union’s arsenal). Simply put, one needs an explanation as to the right size for a nation’s nuclear arsenal, or as Malcolm Chalmers puts it, “How much is enough?” To begin, both nuclear superpowers realized that their arsenals’ peak sizes were excessive, and have since made significant reductions. The U.S.’ peaked in 1967 at 31,000 weapons (both strategic and varying sub-strategic or tactical weapons) and has declined to roughly 5,000 by 2010.<sup>2</sup> By comparison, the Russian arsenal peaked at 45,000 weapons in 1986, followed by a decline to 12,000 by 2010.<sup>3</sup> In stark contrast, none of the five smaller declared nuclear weapons states (UK, France, India, China, and Pakistan) has ever possessed an arsenal in excess of 550 weapons.<sup>4</sup>

However, these nations are not small by other means of comparison—four of the five have national incomes equal to or greater than that of Russia and projections place China’s economic growth exceeding that of the U.S. before mid-century.<sup>5</sup> One could argue that the arsenals of China and India are lagging in relation to their economic development and are sure to increase as their international economic footing solidifies. One wonders if such restraint will continue as each grows as a regional and global power. Not surprisingly, each of the four nations examined pursues the answer to ‘how much is enough?’ via their own national peculiarities,

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<sup>2</sup> Malcolm Chalmers, “Introduction and Overview,” *Small Nuclear Forces: Five Perspectives*, Royal United Services Institute for Defence and Security Studies (RUSI) Report (London: Whitehall Reports, December 2011), 4.

<sup>3</sup> Chalmers, “Introduction and Overview,” 4.

<sup>4</sup> Chalmers, “Introduction and Overview,” 4.

<sup>5</sup> Chalmers, “Introduction and Overview,” 4.

which tends to place them into three categories: states *satisfied* with their arsenals, states with *restrained* arsenals, and states with *embattled* arsenals.<sup>6</sup>

### **Satisfied Arsenals**

Not surprisingly, the satisfied states are the UK and France. Both were early entrants to the nuclear club with each conducting initial tests in 1952 (UK) and 1960 (France), and each achieving thermonuclear weapons capabilities in 1957 and 1968, respectively.<sup>7</sup> Coupled to the weapons, each state had achieved long-range ballistic missiles aboard dedicated submarines (SSBNs) by the early 1970s, and each grew their total arsenals to the size of roughly 500 weapons—the British by the late 1970s and the French by the early 1990s.<sup>8</sup> Moreover, neither has remained at their peak values. Following the easing of tensions accompanying the ending of the Cold War, both nations took actions to diminish their arsenal stocks. The UK made relatively drastic cuts and nearly halved their arsenal while moving to a single delivery platform (SSBNs). The French were less draconian; however, they made reductions to stabilize their arsenal at fewer than 300 weapons.<sup>9</sup>

What were the causes for such acute reductions? Both relied heavily on their “close alliance relationships with the U.S.,” and the promise that they would not face nuclear aggression alone.<sup>10</sup> While the UK may have retained a greater reliance on U.S. protection measures than France, both held a skeptical eye to their big brother across the Atlantic. Both nations maintained an independent nuclear force as a hedge against a U.S. unwilling (or unable) to risk her own interests (read cities) in order to provide for allied European protection.<sup>11</sup> One must appreciate that the development of national nuclear arsenals for these two nations came on the heels of a devastating world war, one in which it was perceived the U.S. made a late entry, where France had been overrun, and where the UK was compelled to make a last stand against a conventionally superior continental adversary.<sup>12</sup>

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<sup>6</sup> Chalmers, “Introduction and Overview,” 4-7. There is a fourth yet unrecognized category, the nuclear aspirant. Having a desire for nuclear weapons capability yet lagging behind the embattled arsenals in terms of progress towards that goal defines this actor. Iran, Syria, and Saudi Arabia in response to an Iranian weapon and perceiving limited support from the U.S. provide good examples of nuclear aspirants. Robert P. Haffa, Jr., Ravi R. Hichkad, Dana J. Johnson, and Philip W. Pratt, Deterrence and Defense in “The Second Nuclear Age,” Analysis Center Papers (Los Angeles, CA: Northrop Grumman Corporation, March 2009), 10.

<sup>7</sup> Chalmers, “Introduction and Overview,” 4.

<sup>8</sup> Chalmers, “Introduction and Overview,” 4.

<sup>9</sup> Chalmers, “Introduction and Overview,” 5.

<sup>10</sup> Chalmers, “Introduction and Overview,” 4-5.

<sup>11</sup> Chalmers, “Introduction and Overview,” 5.

<sup>12</sup> Chalmers, “Introduction and Overview,” 5.

Two reasons provide the impetus for these nations acquiring nuclear weapons: concerns for national sovereignty, and the determinations of both to remain significant global powers.<sup>13</sup> Both nations recognized that the sacrifice necessary to acquire these weapons would include a tremendous expenditure of national resources and an opposition from the U.S. under the banner of nonproliferation.<sup>14</sup> While both nations expended vast efforts to acquire and develop their arsenals, both were in some form resource limited, and thus labored to produce arsenals of a size and capability known as the ‘Moscow criterion.’<sup>15</sup> While not a true countervalue arsenal (or targeting scheme), the ability to destroy leadership targets in and around the capital of an adversary (with an assumption that said adversary had a limited missile defense capability) lends credibility to an assured level of retaliatory destruction.<sup>16</sup>

Resource constrained, the arsenals built around the Moscow criterion showed no ability by the holders to expand to a large-scale counterforce capability (focused on the Soviet Union), no ability to develop battlefield (*i.e.*, tactical) weapons, nor an attempt to emphasize their arsenals as nuclear force providers to others under the umbrella of extended deterrence.<sup>17</sup> It appears that ‘how much is enough?’ for the arsenals of the UK and France was satisfied at a level necessary for strategic national protection and little more.

### **Restrained Arsenals**

If France and the UK are satisfied with their arsenals, then China and India have opted to restrain theirs. While both acquired and developed arsenals for national protection, they did so to hedge against future superpower abandonment.<sup>18</sup> China’s concerns sprouted from nuclear threats proffered by the U.S. in the 1950s and were reinforced by Soviet pre-emptive attack plans during

<sup>13</sup> Chalmers, “Introduction and Overview,” 5.

<sup>14</sup> Chalmers, “Introduction and Overview,” 5.

<sup>15</sup> Chalmers, “Introduction and Overview,” 5.

<sup>16</sup> Chalmers, “Introduction and Overview,” 5.

<sup>17</sup> Chalmers, “Introduction and Overview,” 5.

<sup>18</sup> Chalmers, “Introduction and Overview,” 6. According to Joseph Cirincione, the five main reasons that states acquire nuclear weapons are security, prestige, domestic politics, technology, and economics. “The ‘national security’ model argues that states seek nuclear weapons in order to enhance their own security. The ‘prestige’ model emphasized the symbolic value of nuclear weapons: states see the weapons as a prerequisite for great power status. The ‘domestic political’ model views states as units made up of competing internal factions within which influential bureaucratic and military actors can lead a state to nuclear weapons. The ‘technology’ model, or technological determinism, contends that if a state is technologically capable of developing nuclear weapons, then the allure of such a scientific accomplishment will be too much for most leaders to resist. Finally, economic factors, interact with the other four drivers of nuclear proliferation, sometimes encouraging nuclear proliferation and sometimes restraint.” Joseph Cirincione, *Bomb Scare: The History and Future of Nuclear Weapons*, (New Haven, CT: Columbia University Press, 2008), 47-48. Additionally, some countries may want the prestige and power that comes with possessing nuclear weapons more so than having them to use. Dr. Lewis A. Dunn, “21st Century Deterrence Challenges - Exploring Key Issues, Rethinking Traditional Approaches” (address, Rethinking the Foundations of the Nuclear Security Strategy and the QDR Seminar Series, Arlington, VA, 20 May 2009).

the crisis of 1969, further reinforcing China's determination to acquire a deterrent capability.<sup>19</sup> India's campaign to acquire a nuclear deterrent comes from its interactions with China—first a humiliating defeat in the 1962 war and then China's first nuclear test in 1964.<sup>20</sup> They too felt abandoned by the reluctance of both the Americans and British to provide security guarantees. While both nations are rapidly advancing nuclear technologies, their limited capabilities early on led to arsenals that were countervalue focused, specifically counter-city in comparison to the mixed counter-leadership and counter-value targeting of the Moscow criterion.<sup>21</sup>

While these humble beginnings may seem to have been technologically limited (the UK and France were able to access U.S. missile technologies), some view these reduced arsenals as ideologically limited. Claims exist that both China and India were reluctant to give their nuclear weapons programs higher priorities and thus intentionally limited resources for their development.<sup>22</sup> Adding to the ideology mystique, both nations embrace and proclaim a no-first-use policy as part of an MDS.<sup>23</sup> While this ideology may have justified limited resources, the economic success of both nations has eroded their barriers to increased spending on more advanced nuclear technologies. While fiscally they are flush, diplomatically they have reflected on the irrelevance of nuclear weapons to 'less-than-existential threats', which only reinforces their ideology adopted at the infancies of their nuclear programs.<sup>24</sup>

### **Embattled Arsenals**

While the previous four nations' arsenals are in states of pseudo-tranquility, the arsenal of Pakistan is embattled.<sup>25</sup> Pakistan's pursuit of nuclear weapons comes as a struggle for both external security and internal survivability. Two events drove Pakistan's perception of a widening gap in conventional capabilities between it and India.<sup>26</sup> The first was India's 1971 invasion and subsequent dismemberment of East Pakistan. The second was India's 1974 'peaceful' nuclear test.

While external security matters raged, internal stability was crumbling. Pakistani leaders viewed the acquisition of nuclear weapons as "the ultimate guarantor of the country's survival."<sup>27</sup>

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<sup>19</sup> Chalmers, "Introduction and Overview," 6.

<sup>20</sup> Chalmers, "Introduction and Overview," 6.

<sup>21</sup> Chalmers, "Introduction and Overview," 6.

<sup>22</sup> Chalmers, "Introduction and Overview," 6.

<sup>23</sup> Chalmers, "Introduction and Overview," 6.

<sup>24</sup> Chalmers, "Introduction and Overview," 7.

<sup>25</sup> Chalmers, "Introduction and Overview," 7. While Chalmers categorizes Pakistan as a state with an embattled nuclear arsenal, Haffa identifies them as a "fractured" nuclear state—one that has achieved a nuclear weapons capability yet lacks the political stability to ensure its sovereignty and the security of those weapons. Haffa et al., *Deterrence and Defense*, 9.

<sup>26</sup> Chalmers, "Introduction and Overview," 7.

<sup>27</sup> Chalmers, "Introduction and Overview," 7.

Though its arsenal is smaller than most others are, Pakistan's estimated 60 weapons (and enough plutonium and highly enriched uranium to produce 40 more) provide it the deterrent capability necessary to hold its adversary India in check.<sup>28</sup>

### **Superpower Arsenals**

With MDS nations' arsenals ranging from the tens to the low hundreds of strategic nuclear weapons, why then are the U.S. and Russian arsenals so large?<sup>29</sup> The answer seems to be a mix of the way things were, the way they are, and the way they will be for the near future. For the way they were, both nations embraced counterforce-targeting schemes, and in doing so required more weapons than those required for a countervalue (and its variants) targeting schema.<sup>30</sup> Additionally for the U.S., a perceived need to reassure allies through extended deterrence necessitated an arsenal large enough to protect both direct U.S. interests and those of its allies.<sup>31</sup>

For the way they are, an incredible inertia accompanies these large arsenals and their "legacy of an era of 'massive retaliation'...and of the decision to create a 'triad'...any element of which met high assured destruction requirements."<sup>32</sup> As for the way they will be, both nations have strong stakes in their respective nuclear enterprises—their scientific, industrial, and military interests in the field of nuclear weapons.<sup>33</sup> While economic factors limited the satisfied, restrained, and embattled nations' arsenals, those same economic factors impinge upon the rapid denuclearization of the two former superpowers.

### **When and Why Nations Adopted an MDS**

Chapter 1 defined minimum deterrence, and converged on two ideas. The first is that a nation embracing minimum deterrence places limits on its nuclear weapons and strategies retaining them as a means of ensuring national survival. The second defines "minimum" as the smallest force sufficient to threaten retaliation credibly in the event of an attack on the nation.<sup>34</sup> These limits do not absolve a nation from the core tenet of nuclear deterrence: the convincing of

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<sup>28</sup> Col David J. Baylor, "Considerations for a US Nuclear Force Structure below a 1,000-Warhead Limit," *Strategic Studies Quarterly* 5, no. 2 (Summer 2011): 57.

<sup>29</sup> Both France and the UK believe they could wreak historically unprecedented destruction on the world's largest country, and do so with a few handfuls of weapons from arsenals numbering in the low hundreds. Chalmers, "Introduction and Overview," 8.

<sup>30</sup> Chalmers, "Introduction and Overview," 8.

<sup>31</sup> Chalmers, "Introduction and Overview," 8.

<sup>32</sup> Chalmers, "Introduction and Overview," 8.

<sup>33</sup> Chalmers, "Introduction and Overview," 8.

<sup>34</sup> Lawrence Freedman, "British Perspectives on Nuclear Weapons and Nuclear Disarmament," *Unblocking the Road to Zero Nuclear Security Series*, no. France and the United Kingdom (February 2009): 23.

an adversary that the cost of an undesirable action is more than the rewards.<sup>35</sup> The weapons that fulfill the role for threatening a potential use of retaliatory force must be such as to provide a secure second-strike capability. They must be invulnerable but do not need to be of an overwhelming quantity—parity, let alone superiority, is not required.

So, the arsenals that accompany an MDS may be small in quantity, must be survivable, must be credible, and are retained to ensure national survival and by extension, to ensure the protection of vital national interests.<sup>36</sup> This next section examines the nations that embrace an MDS and explores when, why, and to some extent how they adopted that strategy. Since each nation acquired and developed nuclear weapons under differing situations, convenient alignment in answer to these questions is doubtful. While disparate answers are expected, greater interest lies in presenting how much each nation deviates from a central idea.

### **The United Kingdom**

*In 1980, Defence Secretary Francis Pym dismissed justifications for the British nuclear capability such as “political prestige, our status in the Alliance, or a comparison with France ... the concept of a ‘Fortress Britain’ – some kind of insurance policy concept, should the United States go isolationist or the Alliance collapse.” Far more decisive was the view that “Britain needs to be a nuclear power primarily because of what this contributes to NATO’s security of deterrence and, through that, to our own security.”*

– Lawrence Freedman

**A Brief History.** British nuclear weapons history developed alongside that of the U.S. Their involvement in the first atomic weapons development dates back to 1940 when émigré scientists Otto Frisch and Fritz Peierls laid the conceptual groundwork for the construction of an operational atomic bomb.<sup>37</sup> Following the war, the UK nuclear program has battled two dualities: an interplay between independence from and interdependence with the U.S., and the closely linked imperatives of national security coupled to a strong desire to maintain a wide global influence.<sup>38</sup> These dualities rested on binding the U.S. to the defense of both England and Western Europe, and by the later extension, the introduction of nuclear weapons into the alliance

<sup>35</sup> Tanvi Kulkarni and Alankrita Sinha, “India’s Credible Minimum Deterrence: A Decade Later,” IPCS Issue Brief, no. 179 (December 2011): 1.

<sup>36</sup> With regard to credibility, “a potential adversary needs to know that the weapon works; recognize the resolve of the political leadership; and believe that the nation has the ability to mount a strike in response to an attack.” Desmond Bowen, “Deterrence and Disarmament in the UK,” *Survival* 52, no. 1 (February-March 2010): 14.

<sup>37</sup> Malcolm Chalmers, “The United Kingdom: A Status Quo Nuclear Power?,” *Small Nuclear Forces: Five Perspectives*, Royal United Services Institute for Defence and Security Studies (RUSI) Report (London: Whitehall Report, December 2011), 13.

<sup>38</sup> Chalmers, “The United Kingdom,” 13.

of the North Atlantic Treaty.<sup>39</sup> The challenge was for the UK to develop a strategic rationale without repudiating the U.S. nuclear guarantee to Europe and to NATO.<sup>40</sup>

Absent a U.S. defense, and spurred by a post-war demobilization, the UK found itself concerned with resuming a pre-1941 situation. Making things different this time was the UK facing a resurgent Soviet Union. To deter such an opponent, one presumably armed with nuclear weapons, the conventional weapons capabilities of the UK did not suffice—only a strategic nuclear force of last resort would deter an attack or invasion.<sup>41</sup> In addition, the national defense had to balance a drive to maintain global relevance, and the post-war UK government “saw nuclear weapons as a vital part of their efforts to ensure it remained a major power on the international stage.”<sup>42</sup>

**Arsenal Evolutions.** At its peak, the UK strategic nuclear arsenal contained aircraft-launched cruise missiles, land-based ballistic missiles, and both surface and sub-surface sea-based options.<sup>43</sup> A determination through cost-benefit analysis found that only the sub-surface (*i.e.*, SSBN) option provided the necessary level of deterrence at the acceptable cost level.<sup>44</sup> Although they committed to an SSBN-based nuclear force, in 1964 the UK abandoned efforts to build a fifth submarine and held the arsenal to four boats. This force level “was considered sufficient to ensure that, taking into account long refits and rests between patrols, there was always one submarine on patrol at any time. This has remained the standard for a minimum national deterrent.”<sup>45</sup>

Two supplements exhibit the UK’s efforts to maintain a fiscally responsible minimum deterrent. First is the March 1982 following of American nuclear policy by upgrading from the C4 version of the Trident (submarine-launched ballistic missile, SLBM) to the modern D5 (longer range of up to 6,000 miles, ability to carry more warheads than the predecessor Polaris), and the second the 1980s decade-long savings achieved through the removal of ground-launched cruise

<sup>39</sup> David S. Yost, “The US Debate on NATO Nuclear Deterrence,” *International Affairs* 87, no. 6 (2011): 1402.

<sup>40</sup> Freedman, “British Perspectives,” 23.

<sup>41</sup> Chalmers, “The United Kingdom,” 13.

<sup>42</sup> Chalmers, “The United Kingdom,” 14.

<sup>43</sup> The Secretary of State for Defence and the Secretary of State for Foreign and Commonwealth Affairs, “The Future of the United Kingdom’s Nuclear Deterrent, the UK Government, [www.mod.uk](http://www.mod.uk), December 2006, quoted in Nuclear Threat Initiative, “Country Profiles / United Kingdom / Nuclear,” (last updated: November, 2011), <http://www.nti.org/country-profiles/united-kingdom/nuclear/> (accessed 17 February 2012).

<sup>44</sup> Uniquely for an established nuclear state, Britain relies on only one weapon system. Freedman, “British Perspectives,” 30.

<sup>45</sup> Freedman, “British Perspectives,” 24.

missiles.<sup>46</sup> In addition to fiscal concerns, the UK wrestled with reducing adversary military concerns by first taking “care to stress that it was not anxious to maximize the warhead potential [of the upgraded D5 Trident SLBMs].” Next, the British relaxed the threats posed to the Soviet Union, removing the ground-launched cruise missiles (which some view as downgrading to a ‘less-than-minimum’ deterrent) from service. Finally, UK leadership directed setting the yields on their WE-177 warheads to the lower end (near 10 kilotons) in acquiescence to German concerns about the use of high-yield weapons in their defense.<sup>47</sup>

Following the termination of the Cold War, the UK government took actions to find a new minimum level for its nuclear deterrent. In response to the changing political climate, the government promised to keep warhead numbers down; specifically, Secretary of State for Defence Tom King confirmed that Trident would not “carry the maximum” number of warheads.<sup>48</sup> Secretary King’s successor, Sir Malcolm Rifkin, later indicated that not only would the force not carry the maximum number of warheads, but would set its total destructive power to that of the Polaris’ capabilities.<sup>49</sup>

The UK nuclear deterrent force today is entirely sea-based and comprised of four *Vanguard*-class nuclear submarines each carrying up to 16 Trident D5 SLBMs.<sup>50</sup> This force has in effect set a low benchmark for the size of a ‘minimum deterrent’ arsenal.<sup>51</sup> However, this low water mark may not be the UK’s true bottom. As the UK looks to replace its fleet of *Vanguard* submarines, comments made by former Prime Minister Gordon Brown indicate a willingness to reduce the submarine fleet from four to three, while maintaining its minimum deterrence needs.<sup>52</sup>

Arguments abound over this proposal, pitting those that think the UK’s (nuclear) insurance policy may be non-operative one month of the year (*i.e.*, submarine-based deterrence would be unavailable) against those who trumpet the new technologies as being able to ‘do more with less’ and maintain a continual patrol with only three boats.<sup>53</sup> The House of Commons Defence Committee has set a decision timetable on whether to retain the current strategic nuclear

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<sup>46</sup> Freedman, “British Perspectives,” 25.

<sup>47</sup> Freedman, “British Perspectives,” 28.

<sup>48</sup> Freedman, “British Perspectives,” 28.

<sup>49</sup> Freedman, “British Perspectives,” 29.

<sup>50</sup> “While submarines are designed and constructed in the United Kingdom, the Trident missile is purchased directly from the United States – a process that is deemed to be more economical.” Nuclear Threat Initiative, “Country Profiles / United Kingdom.”

<sup>51</sup> Chalmers, “The United Kingdom,” 23.

<sup>52</sup> Baylor, “Considerations for US Nuclear Force,” 57.

<sup>53</sup> Bowen, “Deterrence and Disarmament,” 15. In the past, four boats have been necessary to keep one on patrol because one is normally preparing to enter refit, in refit, or leaving refit and preparing to re-enter service, while another is in maintenance between patrols, and another is either on its way to take up patrol or returning from patrol. Freedman, “British Perspectives,” 35.

deterrent and extend the life of the Trident and its submarines or to evaluate the options for a potential successor platform.<sup>54</sup> By maintaining the Trident, each *Vanguard* submarine could carry up to 16 missiles, each with eight warheads. With all three boats on station, there is a maximum target coverage capability of 384 warheads.<sup>55</sup> While this is a maximum effort, policy will most likely override this quantity of deterrence, as successive governments have committed themselves to reducing the number of warheads until reaching a base of around 160.<sup>56</sup>

**Continued Retention of a Nuclear Deterrence Force.** Arguably, for the first time in its history, the UK faces no immediate military threats to its homeland. According to Malcolm Chalmers, neither Russia nor China retains either the capability or intent to pose such a threat.<sup>57</sup> Therefore, balancing the continued pursuit of remaining a major power on the international stage against an MDS, the UK's nuclear capabilities serve the strategic purpose of reducing or removing the chance for catastrophic great power warfare, and would only be used to deter extreme threats and not to provoke or coerce.<sup>58</sup>

The UK's interests are forward looking, a hedge against the unknown. The UK keeps its nuclear weapons because they provide a crucial 'insurance' or guarantee of protection against future strategic threats to its 'vital interests' in an uncertain and complex international security environment in which nuclear weapons may continue to proliferate.<sup>59</sup> Therefore, the enduring principles underpinning the UK's approach to nuclear deterrence cited in the [December 2006] White Paper focuses on preventing nuclear attack, rather than military use during conflict. The reference to the target for deterrence was not just "nuclear blackmail," but also to "acts of aggression against our vital interests that cannot be countered by other means."<sup>60</sup> Inclusive to those vital interests is the support to the "collective security through NATO for the Euro-Atlantic area."<sup>61</sup>

As a point of appreciation, the UK has shown considerable continuity in its rationale for maintaining nuclear forces.<sup>62</sup> The British government's case for retaining its nuclear arsenal rests on an unwavering faith in the necessity of a nuclear deterrence counter-threat in relation to four

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<sup>54</sup> Freedman, "British Perspectives," 36.

<sup>55</sup> Freedman, "British Perspectives," 41.

<sup>56</sup> Freedman, "British Perspectives," 41.

<sup>57</sup> Chalmers, "The United Kingdom," 21.

<sup>58</sup> Freedman, "British Perspectives," 45.

<sup>59</sup> Two trends characterize the UK's uncertain future: the further spread of nuclear weapons, and a likely increase in complex, regional conflicts that could threaten Britain's 'vital interests'. Nick Ritchie, "Deterrence Dogma? Challenging the Relevance of British Nuclear Weapons," *International Affairs* 85, no. 1 (2009): 93.

<sup>60</sup> Freedman, "British Perspectives," 45.

<sup>61</sup> Freedman, "British Perspectives," 45.

<sup>62</sup> Freedman, "British Perspectives," 36.

broad areas: (1) deterrence against aggression towards British/NATO vital interests or nuclear coercion/blackmail by major powers with large nuclear arsenals; (2) deterrence against nuclear coercion or blackmail with other WMD by regional 'rogue' states; (3) deterrence against state-sponsored acts of nuclear terrorism (enabled by third-world proliferation); and (4) a general residual deterrent function to preserve peace and stability in an uncertain world.<sup>63</sup> While British nuclear forces serve to protect her vital interests, the circumstances of their use "are almost always bound up with a European crisis in which the key question is the role of the United States."<sup>64</sup>

While the UK has never attempted to argue that its own forces could substitute for those of the U.S., they do serve two larger international purposes. The first is to add uncertainty to Soviet/Russian (and potentially American) leaders through the creation of an independent center of nuclear decision-making.<sup>65</sup> The second is to provide a security substitution for circumstances that call the U.S. nuclear guarantees into question. This second point rapidly spins into an international debate opposing U.S. extended deterrence credibility and commitment for issues that it might perceive to have a limited stake in against the true independence of the UK's arsenal use.<sup>66</sup> If seen as controlled by the U.S., UK forces will rapidly lose their deterrent value.<sup>67</sup>

Ultimately, the UK's arsenal and accompanying MDS result from the intersection of current and future national security needs and the economic realities of nuclear weapons. The British appreciate the uncertainty of the future and its influence on their vital interests. Predictions of events out to 2050 become extremely difficult. In addition, concerns arise regarding nuclear proliferation, other nations with large arsenals or the enlarging and modernizing of their arsenals, and the potential for state-sponsored nuclear-armed terrorism.<sup>68</sup> The British balance the need to maintain a minimum deterrent against the listed threats with the understanding that they lack redundant capabilities in their nuclear enterprise. If any of their nuclear facilities, its specialized infrastructure, or highly skilled workforce were lost (by accident or by policy), it would be extremely difficult and expensive to recreate.<sup>69</sup> So the British maintain safety and security through a hedging strategy, sustaining a minimum deterrent arsenal and relying on a strategy vested in a minimum nuclear deterrent.

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<sup>63</sup> Ritchie, "Deterrence Dogma?," 83.

<sup>64</sup> Freedman, "British Perspectives," 39.

<sup>65</sup> Freedman, "British Perspectives," 39.

<sup>66</sup> Freedman, "British Perspectives," 42.

<sup>67</sup> Chalmers, "The United Kingdom," 18.

<sup>68</sup> Freedman, "British Perspectives," 44.

<sup>69</sup> Freedman, "British Perspectives," 34.

## France

*For the French, nuclear weapons remain the positive symbol of an independent foreign and defense policy, in particular from the United States. French political culture has long identified nuclear technology with independence.*

– Bruno Tertrais

**A Brief History.** Unlike the UK's entrenched battle to effectively balance its independence and interdependence with the U.S.' nuclear arsenal, France has for much of its nuclear history operated singularly and with primacy focused on the security of French national interests. Specifically, France pursued nuclear weapons for security and prestige.<sup>70</sup> Compared to the U.S., Soviet Union, and the UK, France embarked on its nuclear program relatively late (1950s) and did not carry out its first nuclear test until the 1960 detonation in the Sahara Desert of Algeria.<sup>71</sup> Pointedly focused, the basis for French nuclear doctrine is a handful of key principles, including two closely linked to the issue of arsenal size and composition: 'sufficiency' and the 'equalizing power' of the atom. France deemed itself a medium power able to deter aggression against its vital interests with limited nuclear capabilities.<sup>72</sup> In essence, France chose early to develop a minimum deterrence posture.<sup>73</sup>

During the first two decades of France's nuclear development, its key objectives for national nuclear policy were to develop the nuclear enterprise (scientific and industrial infrastructure) to ensure the independence and credibility of her nuclear deterrent.<sup>74</sup> Initially, France's employment doctrine followed the '*dissuasion tous azimuts* [detering all-out]' concept, and chose not to deal with any specific potential adversary.<sup>75</sup> That later changed and brought with it the necessary force structure to deter the Soviet Union in a 'weak to the strong' posture (similar to the Moscow criterion).<sup>76</sup> Though focused on the Soviets, this doctrine revolved around the idea that to deter any major adversary, France had to credibly threaten opposing 'vital

<sup>70</sup> Nuclear Threat Initiative, "Country Profiles / France / Nuclear," (last updated: November, 2011), <http://www.nti.org/country-profiles/france/nuclear/> (accessed 17 February 2012).

<sup>71</sup> Nuclear Threat Initiative, "Country Profiles / France."

<sup>72</sup> The 1994 White Paper defined France's 'vital interests' as follows: "The integrity of the national territory, including the mainland as well as the overseas departments and territories, the free exercise of our sovereignty and the protection of the population constitute the core [of these interests] today." This definition has not substantially evolved, although President Chirac stated in his 2006 speech that "the defense of allied countries" could be part of vital interests. Bruno Tertrais, "French Perspectives on Nuclear Weapons and Nuclear Disarmament," Unblocking the Road to Zero Nuclear Security Series, no. France and the United Kingdom (February 2009): 7.

<sup>73</sup> Camille Grand, "France and Nuclear Stability at Low Numbers," Small Nuclear Forces: Five Perspectives, Royal United Services Institute for Defence and Security Studies (RUSI) Report (London: Whitehall Report, December 2011), 28.

<sup>74</sup> Grand, "France and Nuclear Stability," 28.

<sup>75</sup> Grand, "France and Nuclear Stability," 28.

<sup>76</sup> Grand, "France and Nuclear Stability," 28.

interests' and to maintain a capacity to destroy 'more than France' on enemy territory.<sup>77</sup> When required to protect vital interests, France relied on the credibility of the threat and the principle of 'sufficiency' to achieve its national political and strategic objectives.<sup>78</sup>

Then-French President De Gaulle, who believed that NATO's deterrence plans were not credible, painted a political picture operating in parallel to the scientific one.<sup>79</sup> He viewed mutually assured destruction as a single-minded suicide pact in which the U.S. would never trade Chicago for Hamburg, and subsequently when promises to protect France became non-credible, he invested heavily in French nuclear deterrence capabilities.<sup>80</sup> Additionally, the French did not share the U.S.' confidence in a conventional defense and thus argued that deterrence "depended on the sheer uncertainty of a future war."<sup>81</sup> These views and attitudes coalesced around the French policy that nuclear forces have a fundamental, but narrow role in national defense and that to maintain credibility, France would deploy a relatively small but modern force capable of the missions assigned.<sup>82</sup>

**Arsenal Evolutions.** France maintains a force that achieves a level of "sufficiency" (a French expression broadly equivalent to "minimum deterrent") and has chosen "not to equip itself with all the nuclear weapon systems it could have given the technological resources at its disposal."<sup>83</sup> At present, France possesses approximately 300 nuclear weapons, widely dispersed on 4 SSBNs and 84 tactical aircraft.<sup>84</sup> This arsenal is approximately 50 percent of its peak size during the Cold War.<sup>85</sup>

As an overt counterpoint to a traditional MDS, France has consistently rejected the adoption of a "no first-use" (NFU) posture.<sup>86</sup> Leadership in Paris sees nuclear retaliation to be consistent with the right to self-defense, a view shared by many in both nuclear and non-nuclear states. By not stipulating an NFU posture, Paris removed any commitments that may endanger nuclear retaliations, to include first-strike actions, conducted under the guise of self-defense. They also assert that countries that do not respect their own non-proliferation commitments should not expect the NFU policy to apply to them.<sup>87</sup> This clarity of messaging, supported by an

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<sup>77</sup> Grand, "France and Nuclear Stability," 28.

<sup>78</sup> Grand, "France and Nuclear Stability," 28.

<sup>79</sup> Dr. Lani Kass, "DoD Budget Austerity and the New Strategic Guidance" (address, Rethinking National Security in an Era of Declining Budgets Seminar Series, Arlington, VA, 11 January 2012).

<sup>80</sup> Kass, "DoD Budget Austerity," 11 January 2012.

<sup>81</sup> Freedman, "First Two Generations," in *Makers of Modern Strategy*, ed. Paret et al., 770.

<sup>82</sup> Tertrais, "French Perspectives," 6.

<sup>83</sup> Tertrais, "French Perspectives," 13.

<sup>84</sup> Baylor, "Considerations for US Nuclear Force," 57.

<sup>85</sup> Tertrais, "French Perspectives," 13.

<sup>86</sup> Tertrais, "French Perspectives," 8.

<sup>87</sup> Tertrais, "French Perspectives," 8.

arsenal built to achieve sufficiency, gives France's MDS an offensive flavor that may seem contradictory to a "minimum" policy.

**Continued Retention of a Nuclear Deterrence Force.** France's nuclear policy holds to a straightforward rationality: maintain the protection of French vital interests, and if necessary, retaliate with sufficiency using a force that is small, yet capable. Driving that policy is the constraint of a low-numbers arsenal, enshrined by the limitations that France had neither the financial capability nor the perceived strategic requirement to enter into an arms race with the Cold War superpowers.<sup>88</sup> Encasing that rationality is the idea that nuclear weapons make a nation free and independent.<sup>89</sup> President Sarkozy's statements do not hide France's belief in the power their nuclear weapons provide. France will continue to maintain continuity in the nuclear domain.<sup>90</sup> Ultimately, France "maintains nuclear weapons both because of security concerns and to support its regional and global political ambitions."<sup>91</sup>

Today's security rationales are not posed by major threats to Europe, but rather to the existential fears resulting from the unknown. The first rationale refers to what the French call the "life insurance" function—the belief that the world can change with such rapidity that the possibility exists within fifteen to thirty years for a new major threat to Europe to emerge.<sup>92</sup> As a protection measure against this possibility, France believes it is prudent to retain a nuclear deterrent capability.<sup>93</sup> The second rationale shares commonality with the UK: the guarantee that no regional power could blackmail or pressure France with WMD.<sup>94</sup> Compounding both rationales is Paris' opinion that nuclear deterrence is a better and safer choice than missile defense.<sup>95</sup> Ultimately, the choice between deterrence and missile defense will come down to the opinions in Paris as to what means and methods are best for France's MDS. In addition, while France pursued nuclear weapons for both security and prestige under a fiscally constrained environment, it seems that security may be here to stay, but the prestige of attaining equal status with the U.S. and UK may be fading away.<sup>96</sup>

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<sup>88</sup> Grand, "France and Nuclear Stability," 27.

<sup>89</sup> Tertrais, "French Perspectives," 15.

<sup>90</sup> Tertrais, "French Perspectives," 1.

<sup>91</sup> Tertrais, "French Perspectives," 1.

<sup>92</sup> "...Moscow and Beijing...two countries [who] could one day pose a major threat to Europe..." Tertrais, "French Perspectives," 2.

<sup>93</sup> In 1999, then-Prime Minister Lionel Jospin indicated that the French deterrent should be able to counter any serious threat, "even a distant one." M. Lionel Jospin, Premier Ministre, devant l'Institut des Hautes Etudes de Défense Nationale (Paris: 22 October 1999) quoted in Tertrais, "French Perspectives," 2.

<sup>94</sup> Tertrais, "French Perspectives," 3.

<sup>95</sup> Tertrais, "French Perspectives," 4.

<sup>96</sup> "Today, this concern for global status has largely disappeared. ...in 2008, President Sarkozy said clearly, 'It is neither a matter of prestige nor a question of rank, it is quite simply the nation's insurance policy.'"

## India

**A Brief History.** India's nuclear weapons development history follows an exceptional evolution. It initiated from a claimed peaceful acquisition of capabilities, grew through a clandestine development for weaponization and expanded to an overt pronouncement of capabilities for deterrence to now a duality of further development while calling for their reduction and disarmament. In terms of a one-line history, India became a *nuclear-capable power* in 1974, emerged as a *covert nuclear power* by the construction of their first weapon in 1989, and through a series of tests conducted in 1998 became a *declared nuclear power*.<sup>97</sup>

While India's acquisition of the bomb seems rapid, the debates on whether to build one occurred over decades. Even when China went nuclear only two years after the Sino-Indian war of 1962, "there was no consensus among officials in New Delhi that it was necessary to have a nuclear deterrent as a response."<sup>98</sup> The decisions on whether to nuclearize depended on hard-fought domestic debates in which moral concerns held sway in tipping the balance.<sup>99</sup> From the Indian perspective, the debated policy changes were not a simple understanding to "go nuclear."<sup>100</sup>

In November 1964, following debate over whether India should follow China in the pursuit of nuclear weapons, the government proceeded cautiously when Prime Minister Lal Bahadur Shastri authorized the theoretical work on the Subterranean Nuclear Explosion for Peaceful Purposes (SNEPP) project.<sup>101</sup> On 18 May 1974, India conducted a peaceful nuclear explosion. While this signaled an advance in capabilities, India did not follow with subsequent tests or an immediate weaponization of the tested design.<sup>102</sup> At this point, India possessed a "recessed deterrence" capability, meaning that although India had the capability to build nuclear

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Discours de M. le Président de la République – Présentation du SNLE Le Terrible (Cherbourg), 21 March 2008 quoted in Tertrais, "French Perspectives," 4 March 2008 quoted in Tertrais, "French Perspectives," 4.

<sup>97</sup> Rajesh Basrur, "Indian Perspectives on the Global Elimination of Nuclear Weapons," *Unblocking the Road to Zero Nuclear Security Series*, no. China and India (March 2009): 2.

<sup>98</sup> Sumit Ganguly, "India's Pathway to Pokhran II: The Prospects and Sources of New Delhi's Nuclear Weapons Program," *International Security* 23, no. 4 (Spring 1999): 148-77, quoted in Matthew Rendall, "Nuclear Weapons and Intergenerational Exploitation," *Security Studies* 16, no. 4 (October-December 2007): 566.

<sup>99</sup> Rendall, "Nuclear Weapons," 566.

<sup>100</sup> Gaurav Kampani, "From Existential to Minimum Deterrence: Expanding India's Decision to Test," *The Nonproliferation Review*, (Fall 1998): 12.

<sup>101</sup> George Perkovich, *India's Nuclear Bomb: The Impact on Global Proliferation* (Berkeley, CA: University of California Press, 1991), 64-85, quoted in Nuclear Threat Initiative, "Country Profiles / India / Nuclear," (last updated: November, 2011), <http://www.nti.org/country-profiles/india/nuclear/> (accessed 17 February 2012).

<sup>102</sup> Nuclear Threat Initiative, "Country Profiles / India." "India remains outside of the NPT because of its failure to manufacture and explode a device before the 1967 cut-off." Chalmers, "Introduction and Overview," 4.

weapons it did not necessarily have a nuclear weapons program.<sup>103</sup> While Kampani terms this condition as recessed, it holds similarities to a post-existential deterrence option presented in Chapter 1. Nations contemplating nuclear coercion against New Delhi would require accounting for this new nuclear weapons potential into their strategic calculus.<sup>104</sup>

India resumed its weapons program and deterrence strategy development following several interactions with its hostile neighbor Pakistan. Incidents involving the two dotted the late 1980s, including Pakistan's oblique nuclear threats coupled with efforts to acquire nuclear weapons. Of particular concern were the threats Islamabad made in the wake of the 1986 to 1987 Indian Operation Brasstacks [*sic*], a full-scale war simulation on the Indian – Pakistani border.<sup>105</sup> These threats persuaded Prime Minister Rajiv Gandhi to authorize the weaponization of India's nuclear capability.<sup>106</sup> At this point, India's deterrence strategy evolved from a recessed or post-existential deterrent to one of nuclear opacity. Characterization of the strategy included a low level of weaponization, insulation of the nuclear bureaucracy from other branches of government, a non-articulation of a formal doctrine, the non-integration of nuclear weapons into the armed services, and no overt deployment of nuclear forces.<sup>107</sup>

In 1998, the Hindu-nationalist Bharatiya [sometimes Bharatiya] Janata Party (BJP) returned to power led by Atal Bihari Vajpayee, with the goal of building a "macho national security state with nuclear weapons at its center."<sup>108</sup> Shortly thereafter, they authorized two rounds of nuclear tests conducted in May 1998. These tests formally declared India's nuclear status and were complemented by the Vajpayee government declaring that India would build a "credible minimum deterrent."<sup>109</sup>

Prior to India's open declaration, tensions between India and Pakistan seemed to spur potential nuclear weapons development. This was not the case for the 1998 tests, conducted

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<sup>103</sup> Kampani, "From Existential to Minimum Deterrence," 13.

<sup>104</sup> Kampani, "From Existential to Minimum Deterrence," 13. "The second and more enduring description was George Perkovich's "non-weaponized deterrence." It characterized India and Pakistan as having a virtual nuclear capability. Analysts believed both countries to have all the components and the necessary scientific and engineering expertise to assemble first-generation nuclear weapons. These weapons could be assembled at short notice." Kampani, "From Existential to Minimum Deterrence," 13-14.

<sup>105</sup> Nuclear Threat Initiative, "Country Profiles / India." Operation Brasstacks was launched by the Indian Army in November 1986 to simulate a full-scale war on the western border. The exercise was the largest ever conducted in India and comprised numerous conventional forces. Brasstacks allegedly incorporated nuclear attack drills. John Pike, "Brass Tacks," [Globalsecurity.org](http://Globalsecurity.org) (accessed 31 March 2011) and John Cherian, "An exercise in anticipation," [Hinduonnet.com](http://Hinduonnet.com) (accessed 31 March 2011), quoted in Nuclear Threat Initiative, "Country Profiles / India."

<sup>106</sup> Nuclear Threat Initiative, "Country Profiles / India."

<sup>107</sup> Kampani, "From Existential to Minimum Deterrence," 14.

<sup>108</sup> Kampani, "From Existential to Minimum Deterrence," 13.

<sup>109</sup> T.V.R. Shenoy, "The BJP was ready for tests as far as May 1996," [Rediff on the Net](http://Rediff on the Net), 14 May 1998, [www.rediff.com](http://www.rediff.com), quoted in Nuclear Threat Initiative, "Country Profiles / India."

explicitly to highlight China as “potential threat number one.”<sup>110</sup> The tests, though messaged specifically against China, served as a response to the broad and substantial threat to India’s security choices and reflected the strategic evolution to a minimum deterrence and the acceptance as a member of the nuclear club.<sup>111</sup> The BJP declared its intention to build openly a minimum deterrent involving the weaponization of a small number of fission devices coupled to the formal articulation of a nuclear doctrine of no first use and backed by only a rudimentary organizational mechanism to develop nuclear war planning.<sup>112</sup> In sum, the development of India’s nuclear weaponry and associated strategy was not an immediate and proactive response to the perception of a major security threat. Rather, it was a case of reluctant nuclearization [*sic*] arising from concerns about the deteriorating security environment and a pursuit of international prestige.<sup>113</sup>

**Arsenal Evolutions.** India’s arsenal is relatively diverse for a country possessing less than 100 warheads.<sup>114</sup> With a compliment of three types of aircraft (Mirage 2000H, Jaguar IS, MiG-27, and Sukhoi Su-30 MKI) and at least three ranges of ballistic missile (Prithvi-I at 150 km, Agni-I at 700 km, and the Agni-II at 2000 km), India’s delivery platforms appear in synch with its MDS based on the weaponization of only a small number of devices.<sup>115</sup>

India’s arsenal shows tailored capabilities against its two primary deterrence adversaries: short-range missiles and all the aircraft for responses against Pakistan, and longer-range missiles for responses against China.<sup>116</sup> Actions taken by the Indian leadership with respect to arsenal readiness retain credibility through preemptive de-escalatory means. Indian weapons have yet to see deployment in ready-for-use form, let alone placement on alert. The delivery vehicles require mating to weapons, and the bombs themselves remain unassembled.<sup>117</sup> These actions imply a deterrence strategy more closely aligned with existential deterrence than with a variation of minimum deterrence. This is due to the extended period required to assemble, mate, and

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<sup>110</sup> The assessment came from India’s Minister for Defence, George Fernandes, in May 1998. See “China Is Enemy No. 1: George,” Indian Express (May 4, 1998), quoted in Basrur, “Indian Perspectives,” 9.

<sup>111</sup> Kampani, “From Existential to Minimum Deterrence,” 12.

<sup>112</sup> Kampani, “From Existential to Minimum Deterrence,” 12.

<sup>113</sup> Basrur, “Indian Perspectives,” 4.

<sup>114</sup> India currently maintains an arsenal estimated at 60-70 tactical nuclear weapons delivered by aircraft along with short- and medium-range missiles. Baylor, “Considerations for US Nuclear Force,” 57.

<sup>115</sup> Delivery vehicles potentially include the following aircraft: Mirage 2000H, Jaguar IS, MiG-27, and Sukhoi Su-30 MKI. The Prithvi-I land-based short-range ballistic missile (150 km) has been inducted into the army and is believed to be deployable. The medium-range Agni-I (700 km) and Agni-II (2000 km) missiles are said to have been inducted as well, but their operational status is not certain. Basrur, “Indian Perspectives,” 11.

<sup>116</sup> “The bomber force and the Prithvi-I are sufficient to strike Pakistan, but not China. Hence, the development of the intermediate-range Agni-III, which has a range of about 3,000 km and... is considered crucial for deterring China should the need arise.” Basrur, “Indian Perspectives,” 11.

<sup>117</sup> Basrur, “Indian Perspectives,” 6.

transport the weapons to conduct the retaliatory response. However, if these actions maintain the deterrence balance, while granting India the necessary level of credibility, then who are we to suggest actions that may upset the apple cart.

**Continued Retention of a Nuclear Deterrence Force.** The ideas of M. K. Ghandi shaped India's thinking about nuclear weapons. Ghandi espoused non-violence as a political strategy and his moral rejection of nuclear weapons laid the foundation of a deep unease for them.<sup>118</sup> This trepidation for nuclear weapons is highly influential in India's views on their having any part in shaping the growth of India as a regional power.<sup>119</sup> So it is not surprising to see Indian nuclear weapons-based security emphasize the passive aspects of the weapons—deterrence, responsibility, and a commitment to global nuclear disarmament.<sup>120</sup>

As a developing democracy, India's apportionment of its limited resources rejects a requirement for a large deterrent force. Coupled to these limited means is the residual suspicion political leaders hold for the military; they are thus reluctant to let the armed forces expand their efforts beyond a limited extent.<sup>121</sup> These limitations derive from historical experiences that have shaped Indian leaders' beliefs that deterrence requires only a relatively low threshold. It does not require a threat of destroying millions of people (regarded as a level of "unacceptable damage") for deterrence to be effective; a small and low profile deterrence force serves satisfactorily.<sup>122</sup>

India's policies on nuclear weapons seem in conflict: retain for security while seeking disarmament. However, India's weapons remain in a non-deployed posture, policymakers have remained committed to a self-imposed moratorium on testing, and they continue to express interest in disarmament. Conflict arises from India's maintenance of research and development work on a range of weapons issues.<sup>123</sup>

Like China, India is a relative latecomer to the nuclear club, but it holds its youthful energy through efforts to modernize and increases its arsenal.<sup>124</sup> However, while some cite security rationales as justification for more sophisticated nuclear weapons as *ex post facto* rationalization, one must appreciate that India is bordered by two nuclear weapons states.<sup>125</sup> Linking back India's conflicting policies, policymakers would willingly pursue disarmament if

<sup>118</sup> Basrur, "Indian Perspectives," 1.

<sup>119</sup> Basrur, "Indian Perspectives," 8.

<sup>120</sup> "The three aspects of a nuclear weapons-empowered India: security with a thrust on deterrence, a responsible nuclear weapons state and commitment to global nuclear disarmament." Kulkarni and Sinha, "India's Credible Minimum Deterrence," 2.

<sup>121</sup> Basrur, "Indian Perspectives," 6.

<sup>122</sup> Basrur, "Indian Perspectives," 6.

<sup>123</sup> Basrur, "Indian Perspectives," 11.

<sup>124</sup> Barry M. Blechman, "Introduction," *Unblocking the Road to Zero Nuclear Security Series*, no. China and India (March 2009): 0.

<sup>125</sup> Kampani, "From Existential to Minimum Deterrence," 13.

they did not feel that the only threat big enough for them to require an expansive use of nuclear forces was other than a nuclear attack from China or Pakistan.<sup>126</sup>

As mentioned in the brief history, when Vajpayee and his BJP coalition took power in the late 1990s, India's deterrence strategy evolved from an opaque but actual capability-based existential deterrence to a capability demonstrating minimum deterrence.<sup>127</sup> The genesis for this change was not a result of some deterioration in India's external security environment. Some have argued that environment had remained unchanged or was improving since the late 1980s.<sup>128</sup> Rather, it is believed the decision to conduct the 1998 nuclear tests and subsequently elevate the deterrence status was based on a combination of domestic factors.<sup>129</sup>

At the core of the decision was the belief that "nuclear weapons and status constitute legitimate means to enhance the domestic prestige of the state and expand its power in the international system."<sup>130</sup> The newly evolved nuclear doctrine was that of a credible minimum deterrence (CMD), an Indian variation of minimum deterrence. This new posture was composed of the same two elements found in other nation's deterrence doctrine: first, credibility as combinations of political will, capability, effective and assured retaliation, intelligence and survivability; and second, minimum as a quantitative measure of arsenal size, cost, posture and eventually use.<sup>131</sup> The National Security Advisory Board codified this evolved doctrine in its Draft Report on Indian Nuclear Doctrine of 17 August 1999. The government officially adopted (read operationalized) the report as India's Nuclear Doctrine on 4 January 2003.<sup>132</sup> With this

<sup>126</sup> Kulkarni and Sinha, "India's Credible Minimum Deterrence," 3.

<sup>127</sup> Kampani, "From Existential to Minimum Deterrence," 15.

<sup>128</sup> Kampani, "From Existential to Minimum Deterrence," 16.

<sup>129</sup> A combination of four domestic factors account for the decision to move from an existential to a minimal deterrent posture: the ideological worldview of the BJP, its domestic electoral compulsions, the institutional beliefs of India's strategic establishment, and the coalition imperatives of India's nuclear and military research and development bureaucracies. Kampani, "From Existential to Minimum Deterrence," 17.

<sup>130</sup> Kampani, "From Existential to Minimum Deterrence," 22.

<sup>131</sup> "India's nuclear doctrine talks of Credible Minimum Deterrence and not minimum credible deterrence – a deterrent of the smallest possible value (minimum) and yet 'credible'." Kulkarni and Sinha, "India's Credible Minimum Deterrence," 2.

<sup>132</sup> The lack of official Indian nuclear doctrine prior to early 2003 partially explains the absence of a well-defined framework to guide the process of civil-military diversification. This new doctrine defines India's views on nuclear weapons as a self-explanatory, moderate, limited, reasonable and legitimate posture. India does not seek an open-ended nuclear arsenal and pillars other postures like the second-strike capability and no first use. The Indian nuclear doctrine echoes a strictly political interpretation of credible deterrence...as a politico-psychological concept that serves to communicate to potential adversaries that India maintains the will and capability to inflict unacceptable punishment through 'massive retaliation' with nuclear weapons. Credibility is composed an effective second strike capability and survivability ensure through a robust command and control system, safety and security of arsenal, operational force planning, training and preparedness, and research and development. Kulkarni and Sinha, "India's Credible Minimum Deterrence," 2.

doctrine, India's nuclear program went from being peaceful to one including components of a weapons program.<sup>133</sup>

Balance serves as a resolution to the dichotomy of the conflicts mentioned earlier. India's chief balance under CMD is between capability and a small number of weapons.<sup>134</sup> Credibility demonstrated through the 1998 weapons testing established India's capability. India's actions to avoid largess in terms of costs, pace, or posture enforced the minimum characteristic of its deterrent.<sup>135</sup> Adding to the minimum deterrent were defensive posture policies defined by no-first-use and non-use against non-nuclear weapons states, a de-alerted and de-mated warhead status, and absolute civilian control over the nuclear force.<sup>136</sup> In line with M. K. Gandhi's moral rejection of nuclear weapons, the minimum deterrent gives a "sense of conduciveness to disarmament efforts and support to the morality argument."<sup>137</sup> In addition, while India's CMD rests on the tenet of being able to avoid a pre-emptive attack in part to its ability to successfully absorb an adversary's attack and retaliate punitively, its 'minimum' characteristic requires the capability to assemble, deploy, and respond credibly in a short period.

## China

**A Brief History.** China began its nuclear ambitions in response to what it deemed "nuclear blackmail" from the United States, and on 16 October 1964, detonated its first nuclear device.<sup>138</sup> Since then, China has consistently asserted a nuclear doctrine based on a no-first-use concept and an arsenal characterized as a minimum deterrent against nuclear attacks.<sup>139</sup> While this seems like a persistent, absolute statement, it does not accurately reflect China's actions for the latter half of the twentieth century.

Mao's China believed that nuclear weapons were inhumane, posed a threat to all humanity, and should be completely eliminated and totally prohibited—a succinct nuclear abolitionist view that perpetuated China's strong opposition to the concept of nuclear deterrence for much of the Cold War.<sup>140</sup> However, China held a diametric view about nuclear weapons until the belief in nuclear abolition became reality. Until the grave military threats from the United

<sup>133</sup> Kulkarni and Sinha, "India's Credible Minimum Deterrence," 1.

<sup>134</sup> Kulkarni and Sinha, "India's Credible Minimum Deterrence," 1.

<sup>135</sup> Kulkarni and Sinha, "India's Credible Minimum Deterrence," 2.

<sup>136</sup> Kulkarni and Sinha, "India's Credible Minimum Deterrence," 2.

<sup>137</sup> Kulkarni and Sinha, "India's Credible Minimum Deterrence," 2.

<sup>138</sup> Nuclear Threat Initiative, "Country Profiles / China / Nuclear," (last updated: December, 2011), <http://www.nti.org/country-profiles/china/nuclear/> (accessed 17 February 2012).

<sup>139</sup> Nuclear Threat Initiative, "Country Profiles / China."

<sup>140</sup> Sr Col Yao Yanzhu, "China's Perspective on Nuclear Deterrence," *Air & Space Power Journal* XXIV, no. 1 (Spring 2010): 27.

States in the 1950s subsided, Chinese leaders saw no other choice than to ensure China's security through the acquisition and development of their own bomb.<sup>141</sup>

With regard to nuclear weapons, China has always embraced an attitude of logical argument prioritizing matter over mind.<sup>142</sup> China is the only country to have become a near-target of potential nuclear strikes by the U.S. and the Soviet Union (and sometimes even by both at the same time). China's nuclear strategy developed through appreciable influence of the nuclear capabilities, strategies, and doctrines of the two nuclear superpowers, and with the U.S. in particular.<sup>143</sup> It was not until the late 1980s or early 1990s that China's defense modernization spurred the debate to recognize deterrence as a key concept in strategic studies.<sup>144</sup> The result was a strategy that bases deterrence on retaliation and not on denial.<sup>145</sup> That strategy provides four principles for the development of China's nuclear forces: that it is defensive, limited, effective, and safe.<sup>146</sup> Guided by these principles, China's nuclear modernization officials developed retaliatory second-strike capabilities instead of nuclear war-fighting one.<sup>147</sup>

**Arsenal Evolutions.** Very little open source material discusses Chinese nuclear strategy. As a rare exception, China's Central Military Commission published *The Guidelines for Developing Nuclear Weapons*, probably in 1959 amidst deteriorating Sino-Soviet relations.<sup>148</sup> The *Guidelines* established basic parameters for indigenous weapons development and endorsed an arsenal built to provide retaliatory capabilities. The operational doctrine recommended an

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<sup>141</sup> Maj Gen Pan Zhenqiang, "China's Nuclear Strategy in a Changing World Strategic Situation," Unblocking the Road to Zero Nuclear Security Series, no. China and India (March 2009): 32. Mao's pursuit of nuclear weapons reflects his concerns about coercion and blackmail. In his famous 1957 speech "On the Ten Great Relationships," he noted, "We want to have not only more planes and heavy artillery, but also the atomic bomb. In today's world, if we don't want to be bullied, then we cannot do without this thing." The remarks succinctly pointed out not only the defensive nature of China's nuclear programs, but also the fact that Beijing perceived that it had no choice but to develop its nuclear capability because of the environment in which it found itself. He succeeded this view with statements at a 1958 Central Military Commission meeting where he again focused on how the possession of nuclear weapons could prevent nuclear coercion. Mao's followers, Deng Xiaoping and Jiang Zemin, supported Mao's concerns. Deng made statements opposing nuclear monopolies and Jiang added that China's acquisition of the bomb removed nuclear blackmail threats. China's pursuit of nuclear weapons aligns with all other nations—protection of national sovereignty. China's approach was to retain that protection with a minimum deterrence force.

<sup>142</sup> Zhenqiang, "China's Nuclear Strategy," 32.

<sup>143</sup> Zhenqiang, "China's Nuclear Strategy," 32.

<sup>144</sup> Yanzhu, "China's Perspective," 27.

<sup>145</sup> Yanzhu, "China's Perspective," 28.

<sup>146</sup> Jeffrey G. Lewis, *The Minimum Means of Reprisal: China's Search For Security in the Nuclear Age* (Cambridge, MA: The MIT Press, 2007), 75-76.

<sup>147</sup> Yanzhu, "China's Perspective," 27.

<sup>148</sup> Lewis, *The Minimum Means of Reprisal*, 57.

arsenal of “nuclear and thermonuclear warheads with high yields and long-range delivery vehicles.” It explicitly excluded the development of tactical nuclear weapons.<sup>149</sup>

Adherence to China’s MDS objectives of solely deterring nuclear attack allows for the development of a relatively small arsenal, and therefore maintaining a capability to destroy a few big cities in retaliation (counter-value) should be enough to frustrate any potential adversary.<sup>150</sup> Thus, China’s focus is on maintaining a small but credible retaliatory force deemed “effective” and one that is capable of delivering a limited retaliatory strike.<sup>151</sup>

China’s pledges of non-first-use and not to threaten or to use nuclear weapons against any non-nuclear state (under any circumstances) reflects not only the nature and mission of its forces, but also governs their size, configuration, readiness, and pace of development.<sup>152</sup> China’s sole goal of nuclear deterrence requires a reasonable degree of alertness, but not necessarily keeping the nuclear forces at hair-trigger alert status. With a retaliatory-only mission, Beijing can accept a delayed response as it completes the forensics on who perpetrated the initial strike. That timing allows the mating of warheads to delivery missiles, aircraft, or submarines.<sup>153</sup>

As open sources report, China possesses approximately 240 nuclear warheads, with the belief that its 20 ICBMs (and approximately 80 accompanying warheads) stand alert with their warheads stored at a separate location near the missiles.<sup>154</sup> When paired, China’s MDS retaliatory capability of destroying a few big cities (counter-value) and its no-first-use policy make it unnecessary to seek either nuclear war-fighting capabilities or the development of non-strategic (tactical) nuclear weapons.<sup>155</sup> Although Chinese nuclear forces continue modernization efforts, they do so only to keep pace with changing times. Modernization has never been a major

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<sup>149</sup> Lewis, *The Minimum Means of Reprisal*, 57.

<sup>150</sup> Zhenqiang, “China’s Nuclear Strategy,” 30.

<sup>151</sup> A small but credible retaliatory force means possessing an adequate number of warheads to ensure the survivability of at least some portion of the force after absorbing a preemptive strike from anywhere.

Zhenqiang, “China’s Nuclear Strategy,” 30, and Lewis, *The Minimum Means of Reprisal*, 78.

<sup>152</sup> Zhenqiang, “China’s Nuclear Strategy,” 30. “The “No First Use” pledge was likely designed as a signal of reassurance to the world community that China’s new nuclear capability posed no threat to any other country.” Zhenqiang, “China’s Nuclear Strategy,” 34.

<sup>153</sup> Zhenqiang, “China’s Nuclear Strategy,” 31.

<sup>154</sup> Baylor, “Considerations for US Nuclear Force,” 56, and Lewis, *The Minimum Means of Reprisal*, 1. Of China’s approximately 240 nuclear warheads, estimates place 186 of them as operationally ready for employment. A 2008 estimate made by Robert S. Norris and Hans M. Kristensen support the 240-warhead estimate and a statement that during the 2006 to 2008 timeframe, China increased their operationally ready warhead count by 25%. A Department of Defense estimate calculated China’s strategic missile numbers increases by 23% over the time period of 2008 to 2010. Nuclear Threat Initiative, “Country Profiles / China.”

<sup>155</sup> Zhenqiang, “China’s Nuclear Strategy,” 31.

priority for Beijing. Some insinuate its purpose is only to keep pace “with the Jones,” with the Jones being the U.S.<sup>156</sup>

**Continued Retention of a Nuclear Deterrence Force.** China’s nuclear strategy retains the fundamental goal of deterring other nations from using or threatening use of nuclear weapons against China.<sup>157</sup> China’s nuclear thought logic conceives of nuclear weapons only as deterring and not winning, with reinforcement provided by its policy of no first use.<sup>158</sup> Chinese nuclear forces remain for one purpose—retaliation following a nuclear strike—and may be affixed the description as “purely defensive in nature.”<sup>159</sup> As such, the Chinese MDS deemphasizes the role of nuclear weapons in national security.<sup>160</sup>

As a second-strike-only arsenal, China maintains its belief that the size should remain relatively small.<sup>161</sup> While Beijing chooses to continue modernization efforts, they present only modest upgrades done under the guise that their use is only for nuclear retaliation. Moreover, “as long as the use of nuclear weapons remains prevented, China has no fear in fighting a conventional war with any other state.”<sup>162</sup> In sum, China retains a nuclear force operating under an MDS, defined not by quantitative criteria, but by survivability and credibility of counterattack.<sup>163</sup>

As mentioned in the brief history, China embraces matter over mind with regard to matters of nuclear weapons issues. Beijing believes that deterrence is relatively insensitive to changes in the size, configuration, and readiness of a nuclear force, and tends to draft policies that sacrifice offensive capabilities in exchange for greater political control and lower economic costs.<sup>164</sup> Simple cost-benefit calculations have led China to view investing in a deterrent effect

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<sup>156</sup> Zhenqiang, “China’s Nuclear Strategy,” 31, and Hans M. Kristensen, Robert S. Norris, and Ivan Oelrich, *From Counterforce to Minimal Deterrence: A New Nuclear Policy on the Path Toward Eliminating Nuclear Weapons*, Occasional Paper No. 7 (Washington, DC: Federation of American Scientists/The Natural Resources Defense Council, 2009), 27.

<sup>157</sup> Zhenqiang, “China’s Nuclear Strategy,” 45.

<sup>158</sup> Yanzhu, “China’s Perspective,” 28.

<sup>159</sup> Lt. General Li Jijun, Vice President of the PLA’s Academy of Military Science, “Traditional Military Thinking and the Defensive Strategy of China,” An Address at the US Army War College, Letort Paper No. 1, 29 August 1997, 7, quoted in Zhenqiang, “China’s Nuclear Strategy,” 29.

<sup>160</sup> “It is essential to distinguish “deterrence effects” from “deterrence strategy. It is certainly correct to say that China’s nuclear strategy has the effect of deterring nuclear attacks, but it is not correct to suggest that China pursues a strategy of nuclear deterrence, as do other nuclear weapon states. Any military strategy that is designed to attain military and security objectives through the use of military assets has a deterrent effect. Because of this view, it is sometimes argued that China is not a nuclear weapon state in the traditional Western sense.” Zhenqiang, “China’s Nuclear Strategy,” 29.

<sup>161</sup> Yanzhu, “China’s Perspective,” 29.

<sup>162</sup> Zhenqiang, “China’s Nuclear Strategy,” 33.

<sup>163</sup> Yanzhu, “China’s Perspective,” 29.

<sup>164</sup> Lewis, *The Minimum Means of Reprisal*, 1-2.

beyond a minimum retaliatory capability to be subject to declining returns.<sup>165</sup> Put bluntly, the first deployment of weapons achieves deterrence, and subsequent arsenal growth leads to sharply declining benefits.<sup>166</sup>

While China never has, nor claims it ever will, enter into a nuclear arms race with another country, the emergence of regional nuclear powers on its periphery has no doubt complicated China's threat perceptions and contingency preparations.<sup>167</sup> Beijing finds it almost inconceivable to imagine a future involving a major conventional war leading to a nuclear exchange with India, Pakistan, the Democratic People's Republic of Korea (North Korea) or any other nuclear-armed or -developing country.<sup>168</sup>

China views the current world nuclear architecture as a miniaturization of the Cold War, and to China, the main nuclear threat seems to come increasingly from the U.S. Beijing sees Washington as pursuing a strengthening of its nuclear eminence and a projection of uncertain strategic intentions through the deployment of its missile defenses as a counter to China's small retaliatory force.<sup>169</sup> In addition, while China may not fear nuclear escalation with many of its regional partners, it maintains a close watch on Japan and a U.S.-aided Japanese entrance into the nuclear club.<sup>170</sup> Because of feeling surrounded, China's MDS must concentrate not on bilateral, but multilateral relationships.<sup>171</sup>

## **Pakistan**

Today, Pakistan does not perceive major threats from Europe, but rather it holds security rationales to counter the existential threat India presents.<sup>172</sup> Pakistan's deterrence relationship with India may be the only bipolar arrangement between nuclear weapons states. The origins of Pakistan's nuclear program lie in the threat perceived vis-à-vis India, and have been reinforced by the numerous conventional conflicts conducted over the states of Jammu and Kashmir.<sup>173</sup> Moreover, while Pakistan was pursuing nuclear capabilities as early as January 1972, it was not until India's May 1974 "peaceful" detonation that gave cause to accelerate the Pakistani nuclear

<sup>165</sup> Lewis, *The Minimum Means of Reprisal*, 4.

<sup>166</sup> Lewis, *The Minimum Means of Reprisal*, 7.

<sup>167</sup> Zhenqiang, "China's Nuclear Strategy," 45.

<sup>168</sup> Zhenqiang, "China's Nuclear Strategy," 43.

<sup>169</sup> Zhenqiang, "China's Nuclear Strategy," 46.

<sup>170</sup> Zhenqiang, "China's Nuclear Strategy," 43.

<sup>171</sup> Dean Cheng, "Chinese Views on Deterrence," *Joint Forces Quarterly* 1st quarter, no. 60 (January 2011): 92.

<sup>172</sup> Nuclear Threat Initiative, "Country Profiles / Pakistan / Nuclear," (last updated: December, 2011), <http://www.nti.org/country-profiles/pakistan/nuclear/> (accessed 17 February 2012).

<sup>173</sup> Nuclear Threat Initiative, "Country Profiles / Pakistan."

program.<sup>174</sup> Pakistan announced itself as a nuclear weapons state following the May 1998 tests conducted in response to those completed by India in the same year.<sup>175</sup>

Pakistan most likely holds to its version of an MDS by default. International attention due to Pakistan's history of proliferation, questionable security of its arsenal, and ongoing animosity with India overshadows the fiscal and technical challenges necessary to produce a greater number of warheads. Pakistan's nuclear posture aims to deter a conventional attack from India.<sup>176</sup> Contrary to a true MDS, Pakistan eschews a no-first-use policy.<sup>177</sup> Its nuclear posture involves the rapid dispersion of a first-strike capable arsenal composed mostly of tactical weapons.<sup>178</sup> Even though it has questionable governmental control over its nuclear weapons, Pakistan will not alter its posture because it has proven effective in deterring India.<sup>179</sup>

### **Israel**

Very little public knowledge exists regarding Israel's nuclear arsenal and its accompanying nuclear deterrence strategy. While it has chosen a nondeclaratory [*sic*] policy towards nuclear weapons, some analysts estimate that it maintains approximately 100 weapons.<sup>180</sup> While Israel possesses a triad-like set of potential delivery vehicles (fighter-bomber aircraft, short- and medium-range ballistic missiles, and a submarine with surface-to-surface missile capabilities), the suspicion is that Israel does indeed possess nuclear weapons, and in sufficient quantity to qualify as a minimum deterrent nation. It is the belief in Israel's "bomb in the basement" that serves as a final deterrent against the recurrence of another holocaust, both in the minds of Israeli leaders and of Jews worldwide.<sup>181</sup>

### **Russia**

Russia is obviously not an MDS country. More likely, Russia is a maximum deterrence nation that only provides nuclear protection for itself. Russia finds itself in a position similar to where the U.S. was in Europe shortly after the completion of WWII—with an under strength yet rebuilding conventional military forced to rely upon augmentation from an appreciable nuclear arsenal. Until Russia can rebuild and re-equip its conventional military forces, she will be dependent upon the credibility of her nuclear forces to retain a seat at the table of great powers.<sup>182</sup>

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<sup>174</sup> Nuclear Threat Initiative, "Country Profiles / Pakistan."

<sup>175</sup> Nuclear Threat Initiative, "Country Profiles / Pakistan."

<sup>176</sup> Nuclear Threat Initiative, "Country Profiles / Pakistan."

<sup>177</sup> Nuclear Threat Initiative, "Country Profiles / Pakistan."

<sup>178</sup> Matthew Kroenig, "Time to Attack Iran: Why a Strike Is the Least Bad Option," *Foreign Affairs* 91, no. 1 (January/February 2012): 95.

<sup>179</sup> Kroenig, "Time to Attack Iran," 95.

<sup>180</sup> Baylor, "Considerations for US Nuclear Force," 57.

<sup>181</sup> Cimbala, "Nuclear Arms Reductions," 339.

<sup>182</sup> Cimbala, "Nuclear Arms Reductions," 336.

This dependency is in stark contrast to a U.S. policy of decreasing reliance upon its nuclear forces. Russia continues to expand its weapons capabilities through the deployment of more road-mobile and silo-based ICBMs, the fielding of both a new class of SSBN and the associated SLBM forces, and the pursuit of a new long-range bomber.<sup>183</sup> Additionally, Moscow's primary concern is preventing a nuclear attack by America or China, not the UK or France.<sup>184</sup> For the near future, U.S. deterrence policy must rectify itself against the capabilities of this sleeping bear.<sup>185</sup>

### **South Africa**

The history of South Africa's nuclear weapons program may serve as a uniquely successful case for nuclear acquisition and development followed by rejection and ultimately abandonment. As mentioned in this chapter's introduction, South Africa is the only nation to 'give back' its nuclear weapons capability—it did so under improving conditions of national security. The South African nuclear program began as early as 1974 when the government made the decision to “develop a limited nuclear deterrent capability.”<sup>186</sup> Like many other nuclear nations, South Africa made the decision to pursue nuclear weapons primarily for two reasons: security and prestige.<sup>187</sup>

An October 1977 U.S. Special National Intelligence Estimate attributed this decision to South Africa's “growing feeling of isolation and helplessness, perceptions of major military threat, and desires for regional prestige” while concluding that no country neighboring South Africa possessed a serious military threat to Pretoria in the 1970s.<sup>188</sup> In stark contrast to the second statement, the combination of Cuban forces introduced into Angola and the imposition of a United Nations military embargo intensified South Africa's security concerns. Several factors contributed to the South African drive to develop WMD, namely: the pressures felt from border insecurity, a strong distrust of neighboring countries, doubts about the true intentions of Western

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<sup>183</sup> Haffa et al., *Deterrence and Defense*, 8.

<sup>184</sup> Ritchie, “Deterrence Dogma?,” 88.

<sup>185</sup> “Russia will continue to prompt major considerations for U.S. nuclear strategy and deterrent capabilities in the second nuclear age.” Haffa et al., *Deterrence and Defense*, 8.

<sup>186</sup> In 1993, South African President F. W. de Klerk announced publically that South Africa had pursued a nuclear weapons program from 1974 through 1990 as a deterrent to counter a perceived Soviet threat in the region. De Klerk cited historical, international, and political reasons such as the Soviet expansionist threat in Southern Africa and Cuban forces in Angola to justify South Africa's decision to obtain nuclear weapons. Nuclear Threat Initiative, “Country Profiles / South Africa / Nuclear,” (last updated: November, 2011), <http://www.nti.org/country-profiles/south-africa/nuclear/> (accessed 17 February 2012).

<sup>187</sup> “Simply stated, the five main reasons that states acquire nuclear weapons are security, prestige, domestic politics, technology, and economics.” Cirincione, *Bomb Scare*, 47.

<sup>188</sup> Nuclear Threat Initiative, “Country Profiles / South Africa.”

powers, and the country's increasing isolation from the international community because of its embrace of apartheid.<sup>189</sup>

Stemming from the fears of a direct invasion, or from an invasion force hosted by Soviet-backed troops in South African-controlled Namibia, Pretoria quietly developed a multi-stage nuclear deterrence strategy.<sup>190</sup> The first stage focused on keeping the country's nuclear capabilities secret or ambiguous in the absence of hostilities. The second stage would be triggered by an elevated invasion threat, and would consist of two parts: first, to confidentially indicate to one or more major powers South Africa's deterrent capability in the hopes of persuading an intervention; second, to publically declare its nuclear capability if part one proved unsuccessful. The third stage would consist of a nuclear demonstration via either an underground or open ocean test detonation. The fourth stage was one of last resort—the threatened use of battlefield nuclear weapons.<sup>191</sup> Complementing Pretoria's perceptive and calculated deterrence strategy was the country's technical abilities to produce the weapons in a timely fashion.

Several factors explain Pretoria's successful secret acquisition of nuclear weapons. Those include the mastering of fissionable material production, the ability to manufacture the complex components necessary for weaponization, the benefits gained from foreign contacts for both weapons knowledge and procurement capabilities, and a sense of restraint in not becoming overly ambitious and opting for a simple, low-cost weapons design.<sup>192</sup> While conducted with efficiency and focus, South Africa's nuclear weapons program became unnecessary in less than a quarter-century. The August 1988 ceasefire between South Africa, Cuba, and Angola improved South Africa's border security substantially, and proved pivotal in Pretoria's decision to dismantle their nuclear weapons program.<sup>193</sup> Pretoria's six completed weapons (and one in production) were dismantled prior to South Africa's acceding to the nuclear Nonproliferation Treaty (NPT) in July of 1991.<sup>194</sup>

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<sup>189</sup> Nuclear Threat Initiative, "Country Profiles / South Africa."

<sup>190</sup> Nuclear Threat Initiative, "Country Profiles / South Africa."

<sup>191</sup> Nuclear Threat Initiative, "Country Profiles / South Africa."

<sup>192</sup> Several factors explain Pretoria's successful acquisition of nuclear arms. First, South Africa quickly mastered the uranium production and enrichment process, developing a complete nuclear fuel cycle with advanced waste management techniques. Second, South Africa's defense industry was sufficiently advanced to be able to manufacture the necessary delivery components. Third, the nuclear program benefitted from knowledgeable personnel and a well-established foreign procurement network. Finally, South Africa was not overly ambitious, opting for simple, low-cost weapons designs. Nuclear Threat Initiative, "Country Profiles / South Africa."

<sup>193</sup> Nuclear Threat Initiative, "Country Profiles / South Africa."

<sup>194</sup> Waldo Stumpf, "South Africa's Nuclear Weapons Program: From Deterrence to Dismantlement," *Arms Control Today*, December 1995/January 1996, 6.

### **Adopting an MDS – When, Why, and How**

This chapter explored case studies of four MDS-adopting nations, seeking answers to three questions. The first asks when do nations adopt an MDS. The second asks why is it adopted and the third what sets the size of the arsenal. The intent of finding these answers was to provide lessons and suggestions for a U.S. adoption of an MDS. It should not be surprising that the answers to the three questions split into two groups: a majority and a minority. It should also not be surprising that those groups split along either East/West lines or old/new nuclear powers. What is universal is that concerns for national security are not the sole driver for these decisions. A surprising truth is that security comes at a price, and the high cost of nuclear weapons drive nations to pursue fiscally responsible minimal arsenals and accompanying strategies.

#### **When Do Nations Adopt an MDS?**

Small and medium nuclear countries, with one exception, adopted an MDS from their program's infancy. In fact, they tended to adopt a policy of minimalism that then generated a strategy of minimum deterrence. France, China, India, Pakistan, South Africa and presumably Israel all set policies embracing what would later translate to an MDS before they began the acquisition and development of their nuclear weapons programs.

As the lone exception, the UK made efforts to sustain a nuclear strategy greater than some minimum. The characterization of that strategy is termed "minimum-plus." The "minimum" was in line with both the academic definition and the examples set by the other small and medium nuclear powers. For a minimum, a nation possesses a deterrent capability to protect its sovereignty and vital interests. The UK's "plus" is the addition of the obligations levied through the offering of extended deterrence capabilities to NATO and the other European nations.

Through a combination of post-Cold War political relaxations and greater fiscal stewardship, the UK reactively withdrew to a small, single-component arsenal that by default dictates the (retroactive) adoption of an MDS. While the geopolitical scene viewed by the UK has changed, and in association its deterrence requirements, it was the oppressive costs of maintaining a robust triad arsenal (land, sea, and air-delivered weapons) that forced the strategy change. The reduced threats to national sovereignty deemed this acceptable because of the efficiencies gained through technological advancements, and the continued promise of an aid to NATO and European protection by the U.S.

#### **Why Do Nations Adopt an MDS?**

All MDS-adopting nations choose to do so under fiscal, domestic and international political pressures to place limits on their arsenals. The majority pressure comes from the significant cost of nuclear weapons. While a number of 'rogue' nations have received aid in

developing their programs (see the ‘successes’ of Pakistan’s A. Q. Khan), most must foot a bill from inception through modernization. As the warheads’ size and complexity grow, so too do the delivery platforms. The example provided by the UK serves as great support to this point.

At its greatest breadth, the UK’s arsenal included ground-launched cruise missiles, ground-launched ballistic missiles, aircraft-delivered bombs and missiles, and sea-launched ballistic missiles. Through careful analysis of both the geopolitical context and the realistic costs, UK leadership concluded that four SSBNs carrying SLBMs filled the necessary minimum deterrent needed to meet policy requirements. The UK was able to take advantage of unique cost saving measures through its partnership with the U.S. By sharing missile technologies and warhead designs, the UK was able to leverage off its big brother and recoup some cost savings. Regardless, the oppressive costs of its nuclear weapons program forced an economic juggernaut like the UK to make reductions and sacrifices.

The second pressure dovetails into the first. Although some nations have the fiscal capabilities to expand significantly their arsenals, they have chosen not to—the reason being lies in choices made to embrace minimalism. India and China have reluctantly accepted the necessity of nuclear weapons, but at arsenal sizes corresponding to an MDS. At heart, they both prefer nuclear abolition, but maintain arsenals as means of security to counter those who do not share their desire for denuclearization. The choices made in the name of minimalism keeps arsenal size and employment strategy in check against the expanding growth of these two respective economies. For American consideration, the adoption of an MDS may serve as a balanced approach between fiscal belt-tightening and a drive to a nuclear-free world.

### **‘How Much is Enough?’ What Set the Arsenal Sizes?**

As mentioned, the combinations of cost and choices to embrace minimalism led to national policies dictating arsenal sizes that by default or design adopted an MDS. In setting that arsenal size, there is very little commonality among the small and medium nuclear weapons states. The only consistency is each nation’s determination of an arsenal deemed “sufficient” for its needs.<sup>195</sup> That sufficiency is the product of security concerns in protecting vital interests,

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<sup>195</sup> “The UK, France, China and India could each have done more to increase the size and capability of their arsenals if they had committed the resources to do so. Instead...a self-defined threshold of ‘sufficiency’, they exhibited a significant level of restraint, especially when compared with the US and the Soviet Union. The UK and France stabilized the size of their arsenals at around 400-500 by the 1970s, making significant reductions once the Cold War had removed the main existential threat that they faced. Almost half a century after its 1964 test, China still has only a limited capability for intercontinental strike, and a total arsenal that is probably only in the low hundreds. India, for its part, waited twenty-four years between its first (‘peaceful’) nuclear test in 1974 and its second (openly military) test in 1998.” Chalmers, “Introduction and Overview,” 3.

costs, available technologies, desired delivery means, perceived threats, and both domestic and international pressures.

What is sufficient for one nation is most likely not sufficient for another. For most nuclear powers, sufficiency has held to be strategic arsenals of less than 500 weapons, but is for nations embracing measures only to protect their security and vital interests. Does sufficiency change when the obligations placed on the arsenal expand beyond those determined as a “minimum”? In addition, does sufficiency change when retaliatory options open to more than just committing unacceptable damage to an adversary through countervalue attacks? How much is enough and the MDS may change when the root national policies expand beyond national survival and vital interests at a minimum.

### **Conclusions**

In determining when, why, and how nuclear weapons nations adopt an MDS, two findings titrate from the explorations. These findings apply to arsenals of all sizes reviewed and encompassed within Eastern and Western views on deterrence. Additionally, the findings are sequential in pursuit by the nuclear nations. The first finding combines when and why: states acquire nuclear weapons primarily when they perceive survival security threats from potential adversaries and opt for the nuclear option to meet those security concerns (both external and internal) and secondarily for prestige. The second finding focuses on the how: nations then choose to adopt an MDS because of the costs of acquiring and maintaining nuclear weapons. The choice in adopting a minimum follows by determining ‘how much is enough’ (arsenal size) and not spending a penny more. Every nation but the UK recognized this second finding, and the UK later chose it after being unable to support fiscally the arsenal and strategy it wished to possess.

What follows is a synopsis of each MDS-adopting nation’s support to the findings. Presented in the same order as the bulk material above, these encapsulations illustrate the linear determinations each nation made in pursuing nuclear weapons and strategies for their use. Nations determined they needed security (and later the benefits of prestige), they knew nuclear weapons would provide that security, they determined that their nuclear weapons would most likely be for retaliation only, and so they pursued the minimum necessary to guarantee that security. Again, only the UK possessed capability in excess of what they deemed necessary for security and, over time, fiscal pressures drove them to reduce their arsenal to an acceptable minimum.

The UK retains its nuclear weapons for both rational security reasons and as a measure of prestige in its continued pursuit of remaining a major power on the international stage. The cause for the UK’s adoption of an MDS was less about policy and more about economics. The cost of

maintaining a robust triad was becoming oppressive. With the SLBM-carrying SSBNs as the most cost- and deterrence-effective portion of the force, they became the UK's effective minimum arsenal. Therefore, it was the UK's critical fiscal decisions that forced it to shrink and tailor its arsenal, and adopt by default an MDS.

France retains its nuclear weapons for protection of its 'vital interests.' These vital interests encompass both security concerns and support to its regional and global ambitions (crudely, security and prestige). While the UK may have 'backed into' its MDS, France was adamant about adopting an MDS first and then setting an arsenal to fulfill that strategy. France's actions show a balance between fiscal stewardship and a determination of 'sufficiency' through an appropriately sized arsenal. While France chose not to equip itself with all the nuclear weapons systems it could have, given the technological resources at its disposal, it has and will continue to maintain a force that is modern and tailored to meet France's minimum nuclear needs.

India retains its nuclear weapons for one traditional and one unique reason. For traditional, they balance security with the retaliatory threat of nuclear weapons. As for unique, the party in power during the 1998 declaration of nuclear capabilities viewed nuclear weapons possession as a means to solidify a fractured domestic populace. India's preference for arsenal or strategy first has shown a reversal over its relatively short lifespan. From 1974 until the late 1980s, India's strategy was that of no nuclear weapons. From 1989 to 1998, India possessed a limited arsenal but maintained opacity in its strategy. The overt weapons testing in 1998 pushed India to develop a strategy focused on a minimum force, specifically a credible minimum deterrent. The minimum aspect was a quantitative measure of arsenal size and cost. India placed specific limits on arsenal development as a conscious effort to maintain fiscal stewardship. While India exerts efforts to maintain and modernize its arsenal, it does so while balancing its growth with a moral obligation to reject nuclear weapons and pursue global disarmament.

China retains its nuclear weapons for security assurance. China's choice is to support a retaliation-only nuclear policy, and built both a strategy and accompanying arsenal to support that policy. The four principles that guide China's nuclear strategy not only emphasize the defensive, but also do so with a nod to fiscal limitations. By emphasizing a deterrence of defense-only, China amassed a relatively small arsenal that it deems as credible and effective. China's views on arsenal growth beyond the necessary minimum result in poor investment per its cost-benefit calculations. Once achieving the minimum, additions are excessive and their return value declines sharply.

The two remaining nuclear weapons states (Pakistan and Israel) and the one former nuclear weapons state (South Africa) all pursued nuclear weapons as means of ensuring national security. Pakistan's forced acceptance of an MDS by default was due to the high costs of the program, the limits to available technology, but mostly to the international pressured it received on concerns over the development of its limited arsenal. Israel is most likely an MDS adoptee by conditions of both default and design. Speculation is that Israel appreciates the high cost and international scrutiny of developing and maintaining an extensive nuclear arsenal. There is further speculation that Israel imposed an arsenal cap to limit the provocative nature of being a nuclear-armed Jewish state surrounded by the Arabs of the Middle East. For South Africa, the MDS adoption was also by design. They professed a need for a limited capability but to develop it concealed from the worldview. With the dismantling of the program at only seven weapons, the *ex post facto* arsenal serves to reinforce how limited a program Pretoria was seeking.

The next chapter explores the specifics of each MDS-adopting nation's choices regarding what form their arsenal would take, and what employment options they would choose to demand from that arsenal. This second point highlights how each nation's interpretation of 'minimum' allows for deviations from the employment options afforded to a true minimum deterrent. The retaliation against countervalue targets (read cities) by the secure second-strike force is now just one of the options available to the policymakers of these MDS-adopting nations.

## Chapter 3

### Of Arsenals and Options

As discussed in the previous chapters, the pursuit of a minimum deterrence strategy (MDS) is either by design spurred from a political decree, or by default resulting from the size of a nation's strategic nuclear arsenal. Once a nation possesses both an MDS and the accompanying arsenal, it must decide how it might use its weapons to initiate or retaliate. As a reminder, for a nation employing a true MDS, it has neither the need nor the ability to conduct an initiation or first strike, and thus must target its weapon(s) to provide a credible threat to its adversary. Most national leaders hold dear their regime, and by extension hold dear their territory, population, and material belonging within that territory. Therefore, to influence an adversarial leader, a nation must threaten those items held dear. When a deterrence threat requires reinforcement by the use of nuclear weapons, the heart of nuclear coercion lies in its targeting philosophy.<sup>1</sup>

If deterrence fails and nuclear exchanges commence, the protagonists employ one of two types of generic strikes: first and second strike. A first strike is not simply the first salvo of the exchange. It is an attack directed against an adversary's means of retaliation.<sup>2</sup> First strikes reduce or remove an adversary's capabilities to retaliate, and thus a successful first strike "would be one that either destroyed all of the enemy's nuclear forces on the ground or else intercepted them en route before they could reach their targets."<sup>3</sup> The attacked nation conducts a second strike after absorbing the first-strike blow.<sup>4</sup> This retaliatory counterattack intends to inflict a devastating response after an opponent's first strike.<sup>5</sup> If deterrence fails with a true MDS nation, that nation is second strike-only capable. Therefore, they must absorb their adversary's first strike before retaliating.

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<sup>1</sup> Tanvi Kulkarni and Alankrita Sinha, "India's Credible Minimum Deterrence: A Decade Later," IPCS Issue Brief, no. 179 (December 2011): 2.

<sup>2</sup> "...nuclear weapons are the only weapons that would be even potentially effective in a disarming first strike against an enemy. In a crisis they could be used to strike the other side's nuclear weapons first to reduce the damage that might be inflicted..." Hans M. Kristensen, Robert S. Norris, and Ivan Oelrich, *From Counterforce to Minimal Deterrence: A New Nuclear Policy on the Path Toward Eliminating Nuclear Weapons*, Occasional Paper No. 7 (Washington, DC: Federation of American Scientists/The Natural Resources Defense Council, 2009), 25.

<sup>3</sup> Lawrence Freedman, "The First Two Generations of Nuclear Strategists," in *Makers of Modern Strategy: from Machiavelli to the Nuclear Age*, ed. Peter Paret, Gordon A. Craig, & Felix Gilbert (Princeton, NJ: Princeton University Press, 1986), 753.

<sup>4</sup> Freedman, "First Two Generations," in *Makers of Modern Strategy*, ed. Paret et al., 753.

<sup>5</sup> Tom Sauer, "A Second Nuclear Revolution: From Nuclear Primacy to Post-Existential Deterrence," *The Journal of Strategic Studies* 32, no. 5 (October 2009): 746.

For the counterattack to be effective, the forces that are to conduct it must survive the initial attack. That is, those forces must be survivable, a property that is not an automatic by-product of a nuclear weapons capability.<sup>6</sup> First strikes aim to eliminate all the nuclear weapons of the opponent in one (preemptive) blow, while a second strike must choose between striking the initiator's remaining nuclear forces or striking other targets to inflict a devastating response. Strikes targeting an enemy's forces are termed counterforce, while valued by the adversary's regime (*e.g.*, cities or other population centers) are termed countervalue.<sup>7</sup>

### **Counterforce and Countervalue Targeting**

There are distinct differences between targeting schemes and nuclear strike strategies. First and second strikes are employment strategies, focusing on timing and retaliation. Counterforce and countervalue are targeting schemes focusing on an adversary's nuclear forces and population centers, respectively. A true MDS can only pair a second strike (retaliatory) strategy with a countervalue targeting scheme. A maximum deterrence strategy has the option to pair a first strike (preemptive) strategy with a counterforce-targeting scheme. Any other pairing of strategies with targeting schemes are options for nations employing something 'greater' than a true MDS. This section explains some of the nuances of each employment strategy and targeting scheme. The intent is to appreciate how the case study nations presented in Chapter 2 use various combinations of strategies and targeting schemes at some level 'greater' than prescribed by a true MDS to achieve national security objectives.<sup>8</sup>

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<sup>6</sup> Sauer, "A Second Nuclear Revolution," 746.

<sup>7</sup> Sauer, "A Second Nuclear Revolution," 747.

<sup>8</sup> "In a conflict situation, once deterrence has failed, lesser nuclear states' incentives are to use nuclear weapons first, before greater and medium powers remove them by other means. Once such an adversary initiates use of nuclear weapons, it is not likely to be restrained from further use of a limited arsenal, since there will be enormous pressure to use them or lose them." James Blackwell, "Deterrence at the Operational Level of War," *Strategic Studies Quarterly* 5, no. 2 (Summer 2011): 33-34.

**Table 1: Nuclear Targeting Scheme to Employment Strategy Pairing Considerations**

|                      | <b>Counterforce</b>                                                                                                                                                                                                                                                                                        | <b>Countervalue</b>                                                                                                                                                                                                                            |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>First strike</b>  | <ul style="list-style-type: none"> <li>• A strategy beyond ‘minimum’</li> <li>• Viewed as nuclear warfighting</li> <li>• Designed to deny the adversary a second strike or retaliatory capability</li> <li>• Preferred by the military</li> </ul>                                                          | <ul style="list-style-type: none"> <li>• A strategy beyond ‘minimum’</li> <li>• Viewed as nuclear warfighting</li> <li>• May be gained through bonus damage associated with counterforce strikes</li> <li>• Is morally questionable</li> </ul> |
| <b>Second strike</b> | <ul style="list-style-type: none"> <li>• A questionable ‘minimum’ strategy</li> <li>• Attempts to achieve nuclear parity with the adversary</li> <li>• May be futile if there are no adversary weapons available for targeting</li> <li>• Viewed as political payback and not sound warfighting</li> </ul> | <ul style="list-style-type: none"> <li>• The strategy of ‘minimum’</li> <li>• Designed to punish the adversary</li> </ul>                                                                                                                      |

*Source: Author’s Original Work*

Nuclear warfare divides targeting into two general camps: counterforce and countervalue. Counterforce targeting focuses on an adversary’s military forces (both conventional and nuclear) and their supportive military-industrial complex. A more traditional definition focuses counterforce targeting the adversary’s nuclear strike and control capabilities.<sup>9</sup> Examples include silo-launched ICBMs, airbases for nuclear-armed bombers, ports housing SSBNs, or command, control and communications (C<sup>3</sup>) facilities.<sup>10</sup> First-strike counterforce strategies intend to disarm the adversary of their nuclear weapons by striking before they launch in retaliation, thereby minimizing the impact of the second strike.<sup>11</sup> The countervalue targets are those the national leadership holds dear and traditionally have been civilian population, economic, and political centers.<sup>12</sup> Counterforce targeting tends to reflect denial strategies while countervalue targeting focuses on punishment.

The U.S. military defines counterforce targeting as the employment of strategic air and missile forces in an effort to destroy, or render impotent, selected military capabilities of an

<sup>9</sup> Sauer, “A Second Nuclear Revolution,” 748.

<sup>10</sup> William C. Martel and Paul L. Savage, *Strategic Nuclear War: What the Superpowers Target and Why* (New York, NY: Greenwood Press, 1986), 54.

<sup>11</sup> Edward A. Corcoran, “Strategic Nuclear Weapons and Deterrence,” (November 29, 2005), <http://www.globalsecurity.org/wmd/library/report/2005/sndeterrence.htm> (accessed 5 April 2012).

<sup>12</sup> Martel and Savage, *Strategic Nuclear War*, 123. Additional potential countervalue targets include industry, civilian infrastructure, and other assets valued by a society including, obviously, the lives of its citizens. Kristensen et al., *From Counterforce to Minimal Deterrence*, 29.

enemy force under any of the circumstances by which said enemy could initiate hostilities.<sup>13</sup> When placed in context, the U.S. maximum deterrence nuclear arsenal conducts counterforce targeting in an effort to limit damage to the U.S. in a ‘tit-for-tat’ nuclear exchange.<sup>14</sup> As stated in the Introduction, instilled fear of preemptive (first) strikes by the U.S. or Soviet Union/Russia provides a partial explanation for why both arsenals were of such significant size.

While a counterforce strategy (and its associated arsenal) targets the adversary’s military and military-industrial centers, a countervalue strategy predominately targets the adversary’s population.<sup>15</sup> In deterrence calculations, nations believing that a retaliatory strike would target their population centers found incentive in not conducting an initial strike, regardless of counterforce or countervalue targeting. The premise of the assured destruction ‘guaranteed’ by a secure second-strike capability was the true driver of deterrence.<sup>16</sup> Phrased differently, countervalue targeting “ensures credibility and minimalism in the nuclear deterrent.”<sup>17</sup>

If the assumption that national leaders value their population centers over their military forces holds true, then two nuclear adversaries with respectable arsenals should find greater worth in targeting the opponent’s civilians over their nuclear forces. Deterrence threats then hold adversaries in check under the assumption that an initial strike against either counterforce or countervalue targets will be met by a secure second-strike against countervalue targets, thus cancelling any advantage gained by a first strike.<sup>18</sup>

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<sup>13</sup> Department of Defense, “Joint Publication 1-02,” Department of Defense Dictionary of Military and Associated Terms, 8 November 2010 (As Amended Through 15 November 2011), 77.

<sup>14</sup> Robert P. Haffa, Jr., Ravi R. Hichkad, Dana J. Johnson, and Philip W. Pratt, Deterrence and Defense in “The Second Nuclear Age,” Analysis Center Papers (Los Angeles, CA: Northrop Grumman Corporation, March 2009), 19-20.

<sup>15</sup> Protocol I of the Fourth Geneva Convention prohibits the intentional targeting of civilians by military force (including nuclear weapons). Specifically, Protocol I states that civilian objects are not acceptable military targets. A manner of realistic balance allows for the idea of “proportional” collateral damage. It is by this ‘exception’ that some find justification in civilian deaths caused by nuclear strikes against military targets housed within population centers; some define this as ‘bonus’ damage. While this interface of targeting and morality makes for difficult choices, the U.S. is not a party to Protocol I. Francois Bugnion, “The Geneva Conventions of 12 August 1949: From the 1949 Diplomatic Conference to the Dawn of the New Millenium,” International Affairs, no 76. (2000): 45.

<sup>16</sup> Nuclear Files.org, “Counterforce and Countervalue,” <http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/history/cold-war/strategy/strategy-countervalue-force.htm> (accessed April 4, 2012).

<sup>17</sup> Kulkarni and Sinha, “India’s Credible Minimum Deterrence,” 2.

<sup>18</sup> One view argues that countervalue targeting upholds nuclear deterrence because both sides are more likely to believe in each other’s no first use policy. The line of reasoning is that if an aggressor strikes first with nuclear weapons against an opponent’s countervalue targets, then, by definition, such an attack does not degrade the opponent’s military capacity to retaliate. The opposing view however, counters that countervalue targeting is neither moral nor credible because if an aggressor should strike first with nuclear weapons against only a limited number of a defender’s counterforce military targets, the defender should not retaliate in this situation against the aggressor’s civilian populace. However, another moral position is that because they are the aggressor, and therefore are starting the conflict, there should not be a “gloves on” treatment of the aggressor, as that would give further incentive to continue the aggression.

The practicalities of nuclear targeting drives the military to prefer counterforce strategies over countervalue ones because the reduction or elimination of adversary forces limits the potential harm to friendly military forces. Additionally, counterforce strategies are desirable because, from both a moral-philosophical and legal standpoint, they minimize problems associated with noncombatant immunity. As a refutable example, “the bombing of Hiroshima affords, some would say, an example par excellence of a case in which a countervalue strategy was preferable on moral as well as military grounds.”<sup>19</sup> However, this is only one example, and to argue that city bombing is still today “at the heart” of nuclear deterrence is incorrect, as many statements backed by declassified texts have shown.<sup>20</sup> While the threat of massive destruction does indeed remain a possibility in most if not all nuclear doctrines, it is for strategic, technological and to some extent moral reasons that states desire to diversify their targeting policies.<sup>21</sup>

It is the case where counterforce military targets are located in close proximity to cities that targeting biases come into play. If the counterforce targeting strategy considers damage to cities a ‘bonus,’ then it may be maximized by striking more targets near cities, by using weapons with larger than necessary yields, and by locating the target centers closer to the cities versus over the military targets. If the targeting strategy considers bonus damage anathema, the military planners can choose to change tactics to include corresponding lower yields, cleaner weapons, and detonation points moved away from the cities.<sup>22</sup> It is this just warfare preference that keeps counterforce strategies en vogue. Counterforce strategies still largely determine the types of targets in the war plans, the weapons, how quickly they launch, how accurate they must be, what yields they should possess, and how reliable they must be.<sup>23</sup> Whether it is by means of ‘bonus’ damage, or outright targeting, a counterforce arsenal is almost always able to transition to a countervalue strategy.

A true MDS nation employs a second strike and countervalue-only targeting strategy, and must have a secure enough force to absorb a counterforce-targeted first strike. If a nation wishes to employ a nuclear deterrence strategy greater than the true minimum, then it can explore adding capabilities or options to its arsenal. Those capabilities and options include the ability to conduct

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<sup>19</sup> Lt Col John Mark Mattox, “Countervalue Nuclear Warfare: The Limit Case of Noncombatant Immunity,” (28 April 2010) under “Countervalue versus Counterforce,” <http://isme.tamu.edu/JSCOPE04/Mattox04.html> (accessed 4 April 2012).

<sup>20</sup> Bruno Tertrais, “In Defense of Deterrence: The Relevance, Morality and Cost-Effectiveness of Nuclear Weapons,” *Proliferation Papers*, no. 39 (Fall 2011): 15.

<sup>21</sup> Tertrais, “In Defense of Deterrence,” 15.

<sup>22</sup> Bernard Brodie, *Strategy in the Missile Age*, New RAND ed. (Santa Monica, CA: Rand Publishing, 2007), 290.

<sup>23</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 30.

first strikes, to conduct counterforce targeting, or to explore options within counterforce and countervalue targeting. One example would be counterforce strikes against conventional military forces.<sup>24</sup> Another example would be capabilities demonstration, *i.e.*, demonstration detonation.<sup>25</sup> The case study discussions in Chapter 2, for both the UK and France, demonstrate nations adopting a form of minimum deterrence that includes expanded capabilities and options to include various counterforce targeting strategies and potential first strike options.

### **MDS Nations Stockpiles and Employment Options**

#### **The United Kingdom**

As mentioned in Chapter 2, strategists drove the UK's adoption of an MDS by reductions in its nuclear arsenal. With a monad force comprised solely of SSBNs, the UK's strike capabilities are limited to a three-boat fleet carrying 16 Trident D5 SLBMs with up to eight warheads apiece.<sup>26</sup> These are maximum numbers, depicting the arsenal's comprehensive capabilities. Admittedly, this is not a daily deterrent capability, and as such, the UK views its nuclear force as containing a limited number of warheads. That limit necessitates a targeting scheme that is countervalue in character.<sup>27</sup> This qualifier ("in character") makes for unique employment options in that the UK places emphasis on leadership targets ('key centers of state power').<sup>28</sup> This drives a deviation from a staunch countervalue-targeting scheme, allowing for pseudo-counterforce and decapitation strike options.

As an example of a targeting policy that has diversified as a result of improving technology, the accuracy of the UK's Trident missile and the potential for variable yield allows for a wider range of options for attacking targets of 'value' beyond large industrial or population centers.<sup>29</sup> Given the limited size of the UK force, a disarming first strike against a superpower would not be possible. However, the UK's undersized arsenal does provide for the capability of

<sup>24</sup> There are suggestions that China may conduct nuclear counterforce strikes against U.S. or allied conventional forces (*e.g.*, those located on Guam) in the event of a conflict over Taiwan. William J. Perry, Brent Scowcroft, and Charles D. Ferguson, U.S. Nuclear Weapons Policy: Independent Task Force Report No. 62, Independent Task Force Report (New York, NY: Council on Foreign Relations, 2009), 43.

<sup>25</sup> See the example detailed in Chapter 2 about South Africa's multi-stage nuclear deterrence strategy. The third stage of that strategy would consist of Pretoria conducting a nuclear demonstration via either an underground or open ocean test detonation.

<sup>26</sup> Uniquely for an established nuclear state, Britain relies on only one weapon system. Lawrence Freedman, "British Perspectives on Nuclear Weapons and Nuclear Disarmament," *Unblocking the Road to Zero Nuclear Security Series*, no. France and the United Kingdom (February 2009): 30.

<sup>27</sup> Malcolm Chalmers, "The United Kingdom: A Status Quo Nuclear Power?," *Small Nuclear Forces: Five Perspectives*, Royal United Services Institute for Defence and Security Studies (RUSI) Report (London: Whitehall Report, December 2011), 16.

<sup>28</sup> Chalmers, "The United Kingdom," 16. These leadership targets, or key centers of power, typically reside in or near population centers. Commentators regard strikes against leadership targets as a version of counterforce, but their effects would be akin to countervalue.

<sup>29</sup> Chalmers, "The United Kingdom," 23.

attacking military and leadership targets the enemy values.<sup>30</sup> Possibly more plausible is the idea of employing a ‘limited strike,’ one that would not automatically lead to a full-scale nuclear exchange. The 1998 UK Strategic Defense Review defined this option as “sub-strategic,” and offered the possible use of a Trident missile in some sort of warning-shot (demonstration) function.<sup>31</sup> Commentators noted that the “sub-strategic” nature of the show-of-force requires the attacker to clarify this desired outcome by the choice of target.<sup>32</sup>

One additional unique feature of the UK arsenal is its assignment to NATO with the primary function of contributing to the Alliance’s collective defense.<sup>33</sup> The UK has performed this role since 1962 when it agreed to purchase the Polaris ballistic missile system from the U.S.<sup>34</sup> What makes this assignment unique in terms of targeting is the UK’s involvement in the NATO Nuclear Planning Group (NPG) and its roles and responsibilities in coordinating and deconflicting NATO and U.S. nuclear targeting assignments. A nation embracing a true MDS does not have the capabilities to shoulder obligations of this nature. In the case of the UK, the obligations of extended deterrence require a greater than minimum arsenal. This leads to the characterization of the UK’s nuclear deterrence strategy as minimum-plus.<sup>35</sup>

## France

The French nuclear strategy and arsenal are singular in purpose – to protect France’s vital interests, specifically its security and prestige.<sup>36</sup> French political leaders make this abundantly clear through repeated statements that the level of the country’s arsenal is not dependent upon those of others.<sup>37</sup> France’s force of “sufficiency” is comprised of four Le Triomphant-class nuclear submarines and four air squadrons located at four separate bases.<sup>38</sup> Each submarine is

<sup>30</sup> Chalmers, “The United Kingdom,” 23.

<sup>31</sup> Freedman, “British Perspectives,” 30.

<sup>32</sup> Freedman, “British Perspectives,” 43.

<sup>33</sup> Nuclear Threat Initiative, “Country Profiles / United Kingdom / Nuclear,” (last updated: November, 2011), <http://www.nti.org/country-profiles/united-kingdom/nuclear/> (accessed 17 February 2012).

<sup>34</sup> Nuclear Threat Initiative, “Country Profiles / United Kingdom.”

<sup>35</sup> The UK demonstrated the value of its extended deterrence capabilities in the 1960s. “A nuclear capability might neutralize nuclear threats posed by a rogue state, though this implied a readiness to make nuclear commitments to other countries—a policy that would go well beyond anything contemplated since the 1960s, when there had been some suggestions that UK nuclear capabilities might be relevant to Indian attempts to deter China.” Freedman, “British Perspectives,” 43.

<sup>36</sup> “President Chirac made it clear that France considers that terrorism or weapons of mass destruction would not necessarily represent a threat to the country’s vital interests, but that France would not hesitate to use nuclear means should the threshold of vital interests be crossed in the president’s view.” Bruno Tertrais, “French Perspectives on Nuclear Weapons and Nuclear Disarmament,” *Unblocking the Road to Zero Nuclear Security Series*, no. France and the United Kingdom (February 2009): 7.

<sup>37</sup> Tertrais, “French Perspectives,” 15.

<sup>38</sup> Robert S. Norris and Hans M. Kristensen, “Nuclear Notebook: Worldwide Deployments of Nuclear Weapons, 2009,” *Bulletin of Atomic Scientists*, November-December 2009, 90, quoted in Nuclear Threat

fitted with 16 M45 or M51 domestically manufactured submarine launched ballistic missiles (SLBMs) that carry up to six warheads.<sup>39</sup> When three boats deployed, a force fully generated would constitute 48 missiles and perhaps some 250-260 warheads each in the 100-150 kiloton range.<sup>40</sup> For aircraft, France maintains two types: land-based Mirages and sea-based Super-Entendards (stationed aboard the aircraft carrier Charles de Gaulle). Both the 60 Mirage and 24 Super-Entendard aircraft carry the ASMP short-range attack missile.<sup>41</sup> The French claim the need to maintain an air-based leg in addition to its strategic submarine fleet because the M45 and M51 missiles are less accurate than the British Navy's Trident D5s. It is this greater accuracy that allows the UK to rely on its sea-based deterrent alone whereas France requires a more flexible deterrent.<sup>42</sup>

France's nuclear targeting strategy is that of countervalue, for its weapons are not intended to destroy the nuclear forces and conventional arsenals of other countries.<sup>43</sup> They place their focus on countervalue versus counterforce targeting through a strategy of '*anticites*' based on the threat of massive retaliation targeting the opponent's cities.<sup>44</sup> The French chose this targeting scheme for two reasons: the low numbers of weapons in the arsenal, and a doctrine that allowed no room for a counterforce-targeting scheme.<sup>45</sup> While the doctrine evolved from a pure countervalue strategy to a more sophisticated targeting of strategic assets, it never developed into a genuine counterforce strategy that would allow for pre-emption or damage limitation.<sup>46</sup> The conversion from countervalue to counterforce would have represented a contradiction in the French MDS approach to nuclear strategy.<sup>47</sup>

Subsequently, the current French doctrine remains to deter attack on its vital interests through the threat of destroying the attacker's political, economic, and military centers of power – a variation on the countervalue-targeting scheme with a version of decapitation.<sup>48</sup> A unique feature of the French doctrine is the option to threaten an adversary who may have misjudged

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Initiative, "Country Profiles / France / Nuclear," (last updated: November, 2011), <http://www.nti.org/country-profiles/france/nuclear/> (accessed 17 February 2012).

<sup>39</sup> "The Military Balance 2009," International Institute of Strategic Studies, (London: Routledge, 2009), 119, quoted in Nuclear Threat Initiative, "Country Profiles / France."

<sup>40</sup> Tertrais, "French Perspectives," 10.

<sup>41</sup> Tertrais, "French Perspectives," 10.

<sup>42</sup> Tertrais, "French Perspectives," 10.

<sup>43</sup> Tertrais, "French Perspectives," 15.

<sup>44</sup> Camille Grand, "France and Nuclear Stability at Low Numbers," Small Nuclear Forces: Five Perspectives, Royal United Services Institute for Defence and Security Studies (RUSI) Report (London: Whitehall Report, December 2011), 29.

<sup>45</sup> Grand, "France and Nuclear Stability," 29.

<sup>46</sup> Grand, "France and Nuclear Stability," 29.

<sup>47</sup> Grand, "France and Nuclear Stability," 29-30.

<sup>48</sup> Tertrais, "French Perspectives," 8.

French resolve or miscalculated the limits of French vital interests with a limited strike (“nuclear warning”), aimed at “restoring deterrence.”<sup>49</sup> In addition, “French military authorities let it be known in 2006 that a high altitude electromagnetic pulse (HA-EMP) strike also could be an option.”<sup>50</sup>

### **The Collective Views of the UK and France**

What both the UK and French strategies and arsenals show is that nations employing variations of an MDS do not hold to a true minimum deterrence-targeting scheme of second-strike countervalue targeting. Both stick predominately to countervalue schemes, but the lack of a no-first-use policy allows for potentially disarming first strikes, be it counterforce in nature, a demonstration of resolve, or a limited strike. Additionally, the UK provides an extended deterrence capability to NATO, and therefore stretches its arsenal’s obligations past that of protection of national sovereignty. A mix of policy direction and available technologies, both of which have parallels in U.S. nuclear deterrence discussions, enables these strategies and the success of their deterrence postures. In addition, while the arsenal sizes of these two nuclear powers do not reach that of maximum deterrence, these two nations each employ variations of a “minimum-plus” nuclear deterrence strategy: the UK by an expanded countervalue target set plus its extended deterrence obligations; the French by tailoring their countervalue targets to more than just population centers.

### **India**

India tailored its MDS to enforce adversaries’ beliefs in its credibility. While this strategy holds to the definition of an MDS being retaliatory-only, India’s approach to ‘minimum’ requires the capability to assemble, deploy, and respond credibly in a short period. Therefore, India maintains its arsenal in a state of readiness unlike that of the UK, France, or the two nuclear superpowers. India’s forces are not on hair-trigger alert; they keep their weapons separated and partially in their stockpile.<sup>51</sup> The reliance on the ability for its nuclear weapons to deter thanks simply to their existence, paired to a de-alerted posture that would most likely delay a retaliatory response identifies India’s nuclear strategy more as existential than as minimum deterrence.

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<sup>49</sup> Tertrais, “French Perspectives,” 8.

<sup>50</sup> Tertrais, “French Perspectives,” 8.

<sup>51</sup> “Speed of retaliation must no doubt have some value in deterrence, but how much has never been thoroughly examined. It surely cannot compare in importance with certainty of retaliation, and therefore there must be some room for negotiating with respect to schemes that trade off space in retaliation for less provocative deterrence postures.” Brodie, *Strategy in the Missile Age*, 302-303.

In November of 2008, the *Bulletin of Atomic Scientists* estimated that India has approximately 70 assembled warheads, with about 50 of them operational.<sup>52</sup> Additionally, published sources indicate that India produces 20 to 40kg of plutonium annually and has probably accumulated 280 to 600kg of weapons-grade plutonium, enough to build 40 to 120 weapons. India also has a small stock of highly enriched uranium (HEU), but it is unclear if any nuclear weapons contain any of this material.<sup>53</sup> While India has the materials to produce and employ nuclear weapons, they maintain a policy of not constituting a nuclear force on a heightened state of alert.<sup>54</sup> They maintain their nuclear-capable missiles and bombers isolated from their non-nuclear warhead assemblies and fissile cores, all in a de-alerted state. Various government agencies (the armed services, the Defense Research and Development Organization (DRDO), and the Department of Atomic Energy (DAE)) hold these separate components and have plans to reconstitute them rapidly during an emergency or national crisis.<sup>55</sup>

Unlike the UK and France yet similar to China, India professes a no-first-use policy. In conjunction with this policy, India has built a strategy based only on retaliation. Again, unlike the UK and France, India does not subscribe to “limited” options. Their nuclear doctrine unequivocally states that retaliation against a nuclear attack will be “overwhelming.”<sup>56</sup> This statement of an overwhelming response indicates a clear preference for a countervalue counterstrike rather than any variations of a counterforce response.<sup>57</sup>

The condition of “overwhelming” is an evolution in Indian doctrine. This comes from the 2003 operational doctrine change that elevated India’s second-strike character from ‘sufficient’ to ‘massive’.<sup>58</sup> The overwhelming retaliation exhibits one of two understandable contradictions in India’s nuclear doctrine. The first is pairing an overwhelming retaliatory response with a policy of no-first-use. The second is employing massive retaliation for a failed minimum deterrent. When combined, India’s deterrence adversaries must appreciate that once

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<sup>52</sup> Robert S. Norris and Hans M. Kristensen, “Indian Nuclear Forces, 2008,” *Bulletin of Atomic Scientists*, November/December 2008, Vol. 64, No. 5, 38-40, quoted in Nuclear Threat Initiative, “Country Profiles / India / Nuclear,” (last updated: November, 2011), <http://www.nti.org/country-profiles/india/nuclear/> (accessed 17 February 2012). According to the 2010 SIPRI Yearbook, the Indian arsenal comprises 60 to 80 warheads. Shannon N. Kile, Vitaly Fedchanko, Bharath Gopalswamy, and Hans M. Kristensen, “World Nuclear Forces,” SIPRI Yearbook 2010: Armaments, Disarmaments and International Security, (Sweden: Stockholm International Peace Research Institute, 2010), [www.sipri.org/yearbook/2010/08](http://www.sipri.org/yearbook/2010/08).

<sup>53</sup> Nuclear Threat Initiative, “Country Profiles / India.”

<sup>54</sup> Nuclear Threat Initiative, “Country Profiles / India.”

<sup>55</sup> Nuclear Threat Initiative, “Country Profiles / India.”

<sup>56</sup> Rajesh Basrur, “Indian Perspectives on the Global Elimination of Nuclear Weapons,” *Unblocking the Road to Zero Nuclear Security Series*, no. China and India (March 2009): 7.

<sup>57</sup> Basrur, “Indian Perspectives,” 7.

<sup>58</sup> Kulkarni and Sinha, “India’s Credible Minimum Deterrence,” 4.

they cross redlines, they can expect to receive nothing short of the total wrath of an India counterpunch.<sup>59</sup>

## China

Of the four MDS nations analyzed, China holds closest to a true minimum strategy. They possess a relatively small arsenal based on the ability to retaliate with secure second-strike forces, profess a no-first-use policy, and hold an operational doctrine that focuses on countervalue targeting.<sup>60</sup> Chinese countervalue targeting emphasizes “targets that are strategically highly valuable, influential on the overall situation, and easy to hit.” These include population centers or military bases, and look more like the definition of countervalue described in the previous section (countervalue targets...traditionally have been civilian population, economic, and political centers) than the readily accepted one of “city-busting.”<sup>61</sup> By melding a retaliatory-only doctrine with a targeting scheme that allows for possible counterforce strikes, China’s deterrent does not preclude either the targeting of military targets, such as U.S. bases in the Asia-Pacific region, or limited retaliatory strikes.<sup>62</sup> In addition, China does not state that they will execute an “overwhelming” response (like India), and have shown that commanders prepare to retain a reserve force to continue to provide a measure of intra-war deterrence.<sup>63</sup>

It is no secret that China is modernizing its nuclear program, but to what end? Much speculation has postulated that the actions taken by the Chinese are towards developing the capacity to move from a strategy of minimum deterrence to one of limited deterrence.<sup>64</sup> While limited deterrence does not conveniently fit one of the strategy definitions from Chapter 1, it does look similar to issues, options, and capabilities maintained by other nuclear nations. The

<sup>59</sup> Kulkarni and Sinha, “India’s Credible Minimum Deterrence,” 4.

<sup>60</sup> The 1987 Zhanlue Xue (The Science of Military Strategy) notes that the primary purpose of [Chinese] nuclear weapons is to deter a nuclear attack against China. ...[that China must have] “a type of deterrent and retaliatory capability” to counter “nuclear monopoly, nuclear blackmail, and nuclear threats.” The book describes only one kind of operation for China’s nuclear forces, a “nuclear counterstrike” (he fanji) ... “According to the guideline (fangzhen) of striking after the enemy has struck (houfa zhiren), in future nuclear counterattack operations, [the Second Artillery] will implement the counterattack campaign after the enemy’s surprise attack begins.” M. Taylor Fravel and Evan S. Medeiros, “China’s Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure,” *International Security* 35, no. 2 (Fall 2010): 68.

<sup>61</sup> Jeffrey G. Lewis, *The Minimum Means of Reprisal: China’s Search For Security in the Nuclear Age* (Cambridge, MA: The MIT Press, 2007), 42.

<sup>62</sup> Lewis, *The Minimum Means of Reprisal*, 77.

<sup>63</sup> Lewis, *The Minimum Means of Reprisal*, 77. Choosing to retain a reserve force to continue to provide a measure of intra-war deterrence retain a reserve force to continue to provide a measure of intra-war deterrence is a characteristic of a true MDS.

<sup>64</sup> Nuclear Threat Initiative, “Country Profiles / China / Nuclear,” (last updated: December, 2011), <http://www.nti.org/country-profiles/china/nuclear/> (accessed 17 February 2012).

postulated Chinese limited deterrence “entails the capability to deter conventional, theater, and strategic nuclear war, and to control escalation in the event of a nuclear confrontation.”<sup>65</sup>

To enact a limited deterrence strategy, China would need to target both nuclear forces in addition to cities, requiring an expanded deployment of forces and a possible reduction in the nuclear use threshold during wartime.<sup>66</sup> This addition of a “limited” counterforce capability to an existing countervalue strategy draws considerable similarities to the “minimum-plus” strategy enacted by the UK. With the primary objective of China’s nuclear modernization and expansion to preclude U.S. intervention in a Chinese use of force against Taiwan, counterforce targeting under limited deterrence makes sense as a Chinese minimum-plus strategy.<sup>67</sup>

While current capabilities suggest that both China and India are more likely to remain focused primarily on countervalue (counter-city) targeting, rather than the mix of counter-leadership and countervalue targeting seen with UK and French forces, China may be shifting toward a “moderate intensity nuclear deterrence.”<sup>68</sup> This moderate intensity characterization involves making the Chinese arsenal “sufficient and effective.”<sup>69</sup> Regardless of the qualifier or characterization—sufficiency, credibility, effective, overwhelming, or limited—these four nations enact strategies and possess arsenals that hold them closer to minimum nuclear deterrence than to the aggressive positions of maximum deterrence held by the former Cold War superpowers.

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<sup>65</sup> Nuclear Threat Initiative, “Country Profiles / China.”

<sup>66</sup> Nuclear Threat Initiative, “Country Profiles / China.” A book published by the People’s Liberation Army’s Second Artillery, the division of the Chinese military that oversees strategic nuclear missiles, noted that a reduction in the nuclear use threshold be instituted during wartime as a deterrent to enemy conventional strikes on the mainland. Haffa et al., *Deterrence and Defense*, 9.

<sup>67</sup> China has been gradually modernizing and expanding its nuclear arsenal to buttress its minimal deterrent, in part hedging against the growth of the U.S. missile defense system and conventional strike capabilities. The primary objective is to preclude U.S. intervention if China uses force against Taiwan, in response, for example, to a possible Taiwanese move to declare formal independence from China, or to a Chinese decision to incorporate Taiwan into the mainland by force. Perry et al., *U.S. Nuclear Weapons Policy*, 24.

<sup>68</sup> Dean Cheng, “Chinese Views on Deterrence,” *Joint Forces Quarterly* 1st quarter, no. 60 (January 2011): 93.

<sup>69</sup> Cheng, “Chinese Views on Deterrence,” 93.

**Table 2: MDS-Adopted Nations' Nuclear Targeting Schemes**

|                                                                                                                                                                                                                                                                                                                        | <b>The UK</b> | <b>France</b> | <b>India</b> | <b>China</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|--------------|--------------|
| <b>Countervalue (CV)</b>                                                                                                                                                                                                                                                                                               | X             | X             | X            | X            |
| <b>CV + Leadership</b>                                                                                                                                                                                                                                                                                                 | X             |               |              | X            |
| <b>CV + Industrial/Strategic</b>                                                                                                                                                                                                                                                                                       | X             | X             |              | X            |
| <b>CV + Limited Strike</b>                                                                                                                                                                                                                                                                                             |               | X             |              |              |
| <b>CV via Demonstration</b>                                                                                                                                                                                                                                                                                            | X             |               |              |              |
| <b>CV via EMP</b>                                                                                                                                                                                                                                                                                                      |               | X             |              |              |
|                                                                                                                                                                                                                                                                                                                        |               |               |              |              |
| <b>Counterforce (CF)</b>                                                                                                                                                                                                                                                                                               | X             |               |              | ?            |
| <b>CF + Leadership</b>                                                                                                                                                                                                                                                                                                 | X             |               |              |              |
| <b>CF + Conventional Forces</b>                                                                                                                                                                                                                                                                                        |               |               |              | ?            |
| <b>CF + Military-Industrial Complex</b>                                                                                                                                                                                                                                                                                |               |               |              |              |
| <b>CF + Limited Strike</b>                                                                                                                                                                                                                                                                                             | X             |               |              | ?            |
|                                                                                                                                                                                                                                                                                                                        |               |               |              |              |
| <b>Extended Deterrence Offered</b>                                                                                                                                                                                                                                                                                     | X             |               |              |              |
|                                                                                                                                                                                                                                                                                                                        |               |               |              |              |
| <b>Subscribe to No-First-Use Policy</b>                                                                                                                                                                                                                                                                                |               |               | X            | X            |
|                                                                                                                                                                                                                                                                                                                        |               |               |              |              |
| <ul style="list-style-type: none"> <li>• “Leadership” includes “Decapitation” strikes</li> <li>• “Industrial/Strategic” equates to targets of civil infrastructure or political, economic, and military centers of power</li> <li>• “Limited Strike” is also known as “Sub-strategic” and “Nuclear warning”</li> </ul> |               |               |              |              |
| * China’s CV+Leadership designation matches its proclaimed targeting of easily struck military bases                                                                                                                                                                                                                   |               |               |              |              |

*Source: Author’s Original Work*

### **A Closer Look at China’s Nuclear Strategy and Arsenal Development**

Unlike those concerning the two Western nations studied (the UK, France), and the English-speaking Eastern nation (India), communications on Chinese nuclear doctrine have been limited or inaccessible. Within the last decade, researchers have gained access to original military and political texts documenting Chinese doctrinal development. The section offers for examination a glimpse into Chinese nuclear strategy and arsenal development thoughts. Its intent is to educate, not necessarily to advocate actions by the U.S. or any other nation.

China's arsenal development danced the line between existential deterrence (possession but in a de-alerted posture) and minimum deterrence.<sup>70</sup> Regardless of semantics, China retained a belief of pursuing only a small counterattack-capable force.<sup>71</sup> Deng communicated this belief through comments made in 1978. He told the Chilean foreign minister "We also want to build some nuclear weapons, but we are not preparing to make many. When we have the power (*liliang*) to counterattack (*huanji*), we won't continue to develop them."<sup>72</sup>

That counterattack force was designed to create (or threaten to) unacceptable damage to the adversary. Chinese perceptions were that the threshold necessary to achieve "unacceptability" would be low.<sup>73</sup> Therefore, they voiced and pursued a relatively small arsenal, one that emphasizes the concept of "effectiveness" (*youxiaoxing*).<sup>74</sup> The Chinese viewed survivability as the main component of effectiveness. In order to achieve survivability, the (1987) *Zhanlue Xue* called for "increasing the number of bases for missile operations as well as the ability for mobile operations."<sup>75</sup> A survivable, effective, counterattack force of minimal size arguably places early Chinese nuclear deterrence strategy squarely as embracing an MDS by design.

China's contribution to the credibility discussion parallels the other MDS nations. The first factor, capability, reflects both China's arsenal (as mentioned above) and its use. The 1987 *Zhanlue Xue* provides clarity on the role of Chinese nuclear weapons. As prescribed by their no-first-use policy, China believes that "if the enemy first uses nuclear weapons, we must resolutely implement a counterattack and carry out nuclear retaliation."<sup>76</sup> Additionally, China sees two roles for their arsenal. In peacetime, "the strategic task is to play a deterrent role, restraining the

<sup>70</sup> "Chinese policy makers...belief that deterrence is achieved early and with a small number of forces." Fravel and Medeiros, "China's Search for Assured Retaliation," 51.

<sup>71</sup> PLA texts specifically identified *houfa zhiren* (striking after the enemy has struck) as a basic guiding principle for Second Artillery operations. Fravel and Medeiros, "China's Search for Assured Retaliation," 65.

<sup>72</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," 64.

<sup>73</sup> In 1967 Mao Zedong reportedly told Andrew Malreaux, "When I have six atomic bombs, no one can bomb my cities...The Americans will never use an atom bomb against me." [...] Deng expanded on this view in 1981, linking deterrence with the size of an opponent's arsenal: "In the future, there may not be just nuclear war. We have [nuclear weapons] because they also have them. We will have more if they have more. Probably everyone will not dare to use them." [...] Finally, as Defense Minister Zhang Aiping told his colleagues during a 1986 meeting of the Central Military Commission, "Although few in number and poor in quality compared with others, we still have achieved the power to strike back." Fravel and Medeiros, "China's Search for Assured Retaliation," 65.

<sup>74</sup> The authors of the 1987 *Zhanlue Xue* (The Science of Military Strategy) state "our nuclear counterstrike must take effectiveness as the foundation" and that China should develop "an effective nuclear counterstrike capability" (*youxiao de he fanjo nengli*). Fravel and Medeiros, "China's Search for Assured Retaliation," 69.

<sup>75</sup> The *Zhanlue Xue* authors note the importance of warhead miniaturization, penetration, and accuracy as other elements of effectiveness. Fravel and Medeiros, "China's Search for Assured Retaliation," 69.

<sup>76</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," 69.

enemy from launching a nuclear war against us.” In wartime, it serves to “prevent (*ezhi*) the escalation of a conventional war to nuclear war and prevent the escalation of a nuclear war.”<sup>77</sup>

In addition to the roles mentioned above, the 1987 *Zhanlue Xue* provides doctrinal concepts to guide Chinese strategy. Four principles guiding nuclear weapons strategy include:<sup>78</sup>

- centralized control (*jizhong zhihui*),
- strike only after the enemy has struck (*houfa fanji*),
- close defense (*yanmi fanghu*) [this concept refers to the importance placed on the survivability of China’s nuclear forces; the requirements for survivability were developed with a focus on mobility and concealment],
- and key point counterstrikes (*zhongdian fanji*).

A point where Chinese MDS differs from other nations is in its targeting strategy. The 1987 *Zhanlue Xue* does not maintain a clear distinction between counterforce and countervalue targets common in Western approaches to deterrence.<sup>79</sup> Instead, a Chinese counterattack’s purpose is “to damage greatly enemy troops and weapons as well as economic power, and to shock the enemy’s spirit.”<sup>80</sup> While the first two categories lean towards counterforce targeting, an implication for the third may be of countervalue targeting similar to India’s “overwhelming” retaliation.

Additional investigation has identified a range of countermilitary and countervalue retaliation targets.<sup>81</sup> This documentation supports teachings highlighting the value of striking counterforce targets as well as counter-military and countervalue ones.<sup>82</sup> Continuing China’s targeting trifecta, a recent text “classified potential targets into three types: the military (including conventional and nuclear forces), transportation networks, and urban industries.”<sup>83</sup> It is this expansion of potential targets that raises the question of whether China embraces a true MDS or a tailored response MDS (*i.e.*, a version of a minimum-plus strategy).

### **Superpowers Stockpiles and Employment Options**

A detailed discussion of U.S. and Soviet/Russian targeting schemes and the associated deterrence strategies is well beyond the scope of this paper. However, a cursory historical comparison between the two nuclear superpowers and the MDS-adopted nations is appropriate.

<sup>77</sup> Fravel and Medeiros, “China’s Search for Assured Retaliation,” 69.

<sup>78</sup> Fravel and Medeiros, “China’s Search for Assured Retaliation,” 69.

<sup>79</sup> Fravel and Medeiros, “China’s Search for Assured Retaliation,” 70.

<sup>80</sup> Fravel and Medeiros, “China’s Search for Assured Retaliation,” 70.

<sup>81</sup> Fravel and Medeiros, “China’s Search for Assured Retaliation,” 76.

<sup>82</sup> Fravel and Medeiros, “China’s Search for Assured Retaliation,” 76-77.

<sup>83</sup> Fravel and Medeiros, “China’s Search for Assured Retaliation,” 77.

At the dawn of nuclear deterrence, the U.S. held a strategy of massive retaliation that was partially due to its monopoly on nuclear weapons and partially due to an increasingly overwhelming conventional threat by the Soviets against U.S. and Allied interests in Europe. U.S. policymakers made this strategy decision to ‘depend primarily upon a great capacity to retaliate, instantly, by means and at places of our own choosing’.<sup>84</sup> With the Soviet’s developing nuclear capabilities in 1949, the race began to develop the respective arsenals and the accompanying strategies for their employment. The U.S.’ strategy evolved from massive retaliation, through flexible response, and ultimately reached equilibrium with mutual assured destruction. These strategies rooted in countervalue strikes, but each dipped a toe into the counterforce pool.<sup>85</sup>

U.S. policymakers have suggested counterforce and damage-limiting campaigns serve as nuclear equivalents of traditional warfare.<sup>86</sup> During the Kennedy Administration, Secretary of Defense McNamara added a critical caveat to the flexible response strategy, that of a ‘no-cities’ doctrine. The doctrine promoted a counterforce-focus and held countervalue targeting for matters of extreme nuclear escalation. While the design of this doctrine was to spare U.S. cities by means of sparing Soviet cities, McNamara later rescinded it. In a similar vein, Carter’s Presidential Directive 59 aimed to improve deterrence by improving the capacity for a prolonged but limited nuclear war.<sup>87</sup> While the thinking on limited strikes was to add political and economic targets to the military target list, the emphasis placed maximizing the long-term impacts of attacks on economic targets.<sup>88</sup> This was determined futile, and so the prime targets became those “the Soviet leadership values most – its military forces and its own ability to maintain control after the war starts.”<sup>89</sup>

Counterforce and other nuclear warfighting strategies existed under the Nixon, Reagan, and the recently concluded G. W. Bush Administrations. As recent as 2009, the remarks of U.S. Strategic Command commander General Kevin Chilton highlight the U.S.’ continued counterforce targeting schemes through the “wide-scale targeting of Russia’s offensive strategic

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<sup>84</sup> Lawrence Freedman, *The Evolution of Nuclear Strategy*, 3rd ed. (Basingstoke: Palgrave Macmillan, 2003), 81.

<sup>85</sup> “Even the Soviet Union can hardly hide the existence or location of its major cities, and, with thermonuclear bombs available, that information may be all we need to maintain a very considerable deterrent threat.” Brodie, *Strategy in the Missile Age*, 209.

<sup>86</sup> Freedman, *The Evolution of Nuclear Strategy*, 375.

<sup>87</sup> Freedman, *The Evolution of Nuclear Strategy*, 375.

<sup>88</sup> Freedman, *The Evolution of Nuclear Strategy*, 375.

<sup>89</sup> Freedman, *The Evolution of Nuclear Strategy*, 376.

forces and command centers (that is, counterforce targeting along with targeted attacks on infrastructure such as transportation hubs, major industries, and communications centers).”<sup>90</sup>

A hasty analysis shows that large nuclear arsenals (like those possessed by the U.S. and Soviet Union/Russia) allow for deterrence strategies that first ensure survival through threats of countervalue retaliation and then grow to include possible counterforce or limited strike options. Although the two nuclear superpowers’ arsenals have shrunk significantly, and the strike plans tailored while becoming more flexible, the core objective of nuclear war planning has not changed much since the 1970s. Political guidance continues to direct the two militaries to “deploy forces that can credibly threaten to destroy the weapons, war-making, and leadership targets of potential adversaries.”<sup>91</sup>

### **An MDS-based Targeting Scheme for the U.S.**

As presented above, adopting an MDS does not restrict a nation to a countervalue-only retaliatory strategy. Whether choosing not to embrace a no-first-use policy, possessing an arsenal with the accuracy capabilities necessary for counterforce strikes, or adopting a nuclear warfighting posture of limited strikes, many caveats to an MDS can lead to a nation to develop countervalue-plus targeting scheme for an MDS arsenal (*i.e.*, minimum-plus).

As part of deterrence and coercion psychology of the U.S. maintaining a maximum deterrence strategy requires that it give the impression of, and plan according to, using nuclear weapons in a preemptive counterforce role. If policymakers deem these actions too egregious, U.S. nuclear weapons must at least display the appearance of being able to launch promptly upon attack warning in a damage limitation effort.<sup>92</sup> Discussed at length, minimum deterrence attempts to minimize the emphasis on nuclear weapons, and by possessing a secure second-strike force, provides opportunities for a substantially smaller arsenal, so long as those few weapons remain invulnerable.<sup>93</sup> Economics would argue that “[I]f forces were very costly to attack, and cities are very cheap to attack, the optimum force will not be very large.”<sup>94</sup> The countervalue-targeting scheme advocated by an MDS makes attacking adversary nuclear forces costly, while holding their cities at risk very cheap.

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<sup>90</sup> Paul Doty, “The Minimum Deterrent and Beyond,” *Daedalus* 138, no. 4 (Fall 2009): 137.

<sup>91</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 10.

<sup>92</sup> Sauer, “A Second Nuclear Revolution,” 747.

<sup>93</sup> “As long as the opponent believes that the can be attacked with tens of nuclear weapons in a retaliatory strike, the fear of assured destruction will prevail...The current nuclear weapons postures of Israel, France, and especially the UK can to a certain extent be regarded as examples of minimum deterrence, especially in the sub-domain of force structure.” Sauer, “A Second Nuclear Revolution,” 749.

<sup>94</sup> Freedman, *The Evolution of Nuclear Strategy*, 181.

## Arsenal Size Considerations

A nation adopting an MDS must accept the substantial reduction in available nuclear options. These reductions include the possible loss of options for counterforce targeting.<sup>95</sup> If the U.S. took actions resulting in the loss of counterforce capabilities, it must accept both the loss of a first-strike capability aimed at preemptive attacks against Russian nuclear forces as well as the potential inability to strike submarine-based, mobile land-based, or other well-hidden weapons.<sup>96</sup>

Policy-driven drastic reduction in arsenal size would most likely spur the reduction in nuclear options. While doing so may be politically palatable, the reductions would create targeting challenges (*e.g.*, against both China and Russia). Additionally, if the arsenal is cut to some lower level (below 1,000 warheads, *e.g.*) it may require the reversal from a top-down targeting approach to one that is bottom-up (*i.e.*, “zero-based” targeting).<sup>97</sup> Therefore, arsenal size calculations accompanying the adoption of an MDS at a minimum must include “the number of weapons/warheads required for taking out an adversary’s non-military/civilian centers.”<sup>98</sup> From there, policy decisions about potential additional uses of the arsenal would only add to its size or technical characteristics.<sup>99</sup>

As mentioned earlier, the definition of countervalue targets include “those items the national leadership holds dear.” If in reviewing nuclear strike preparations, planners find targets that the adversary’s society values, U.S. policymakers may choose to adjust war plans and force structure to threaten those targets. These adjustments may enhance the credibility of U.S. deterrence threats. If this holds true, one might argue this is a concept identified as tailored deterrence.

The G. W. Bush Administration enacted this sub-category of deterrence by the explicit statement “that U.S. nuclear weapons could be used in attacks against a number of nations that might have developed and deployed chemical and biological weapons, even if they did not

<sup>95</sup> Doty, “The Minimum Deterrent and Beyond,” 137.

<sup>96</sup> Doty, “The Minimum Deterrent and Beyond,” 137.

<sup>97</sup> RAND Corporation, “NDRI Pentagon Briefing Examines the Future of Nuclear Deterrence,” RAND Corporation, [http://www.rand.org/natsec\\_area/products/nuclear.html](http://www.rand.org/natsec_area/products/nuclear.html) (accessed 14 November 2011).

<sup>98</sup> Kulkarni and Sinha, “India’s Credible Minimum Deterrence,” 3.

<sup>99</sup> Kulkarni and Sinha, “India’s Credible Minimum Deterrence,” 3.

<sup>99</sup> “Throughout the two terms of the [G. W.] Bush administration, the size of the [U.S.] arsenal was justified by appealing to requirements: to strike a large number of targets in half a dozen countries; to maintain several different war plans with numerous strike options, including large strikes against Russia and China and smaller ones against regional states; and to ensure that counterforce targets be destroyed with high confidence. In addition, a “hedging” policy that dated to the Clinton administration required the military to keep thousands of warheads in reserve to safeguard against strategic surprises or some hypothetical unforeseeable technical failure of deployed weapons.” Kristensen et al., *From Counterforce to Minimal Deterrence*, 8.

possess nuclear weapons.”<sup>100</sup> The idea of tailoring a deterrence strategy “to hold at risk what opponents value, including their instruments of political control and military power” aligns with intent of a countervalue-targeting scheme and supports a variation on embracing an MDS and its accompanying arsenal.<sup>101</sup>

### **A Possible U.S. MDS Targeting Scheme: Countervalue to Include WMD**

A U.S. adoption of an MDS variant similar to that of the other two western nations (UK, France) would provide for both second-strike countervalue targeting schemes as well as limited strike options. The limited strikes would retain countervalue characteristics but would specifically target adversary WMD capabilities. The challenge for the U.S. by potentially expanding its definition of countervalue beyond cities to include WMD facilities significantly broadens “the geographical reach and number of potential scenarios for U.S. nuclear strike options.”<sup>102</sup>

In its current form, the U.S. nuclear strike operations plan (OPLAN) 8010 has embraced this distended targeting scheme to include “WMD production, storage, and delivery systems, adversary decision-makers, critical command and control facilities, and adversary leadership power bases.”<sup>103</sup> These targets again maintain parity with that of the UK (‘key centers of state power’) and France (threat of destroying the attacker’s political, economic, and military centers of power).<sup>104</sup> The challenge to an MDS-arsenal will come in the form of an expanded target list: “[B]y expanding the targets to include ‘WMD’ very broadly defined and by including four regional powers in addition to Russia and China, the number of potential scenarios and targets has actually increased since the early-1990s.”<sup>105</sup> The compounded choice of retaining countervalue targeting capabilities against WMD facilities and the number of potential scenarios and targets makes arsenal size and composition management more complicated than retaining city busting-only capabilities.

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<sup>100</sup> Amy F. Woolf, *Nuclear Weapons in U.S. National Security Policy: Past, Present, and Prospects*, Prepared for Members and Committees of Congress (Washington, DC: Congressional Research Service, updated 28 January 2008), Summary.

<sup>101</sup> With respect to open-source reporting on U.S. Operations Plan (OPLAN) 8010 from 2008 “...U.S. deterrence policy to hold at risk what opponents value, including their instruments of political control and military power...types of targets to be held at risk for deterrence purposes include leadership and military capabilities, particularly WMD, military command facilities and other centers of control and infrastructure and support military forces.” Kristensen et al., *From Counterforce to Minimal Deterrence*, 11.

<sup>102</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 8.

<sup>103</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 22.

<sup>104</sup> Like OPLAN 8044 and to a large extent the SIOP, the target categories for OPLAN 8010 include critical war-making and war-supporting assets such as WMD forces and supporting facilities, command and control facilities, and the military and political leadership. Kristensen et al., *From Counterforce to Minimal Deterrence*, 9.

<sup>105</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 10.

Additional nuances occur when considering countervalue arsenal capabilities. If threatening to hold key political or military centers of power at risk, the U.S. must consider maintaining a capability to attack hardened or deeply buried assets such as command centers.<sup>106</sup> Failing to do so violates “the most fundamental tenet of deterrence... holding at risk whatever the enemy values.”<sup>107</sup> If wishing to hold economic centers at risk, the U.S. may seek to establish a constrained subset of countervalue targets termed infrastructure targets.<sup>108</sup> This series focuses on targets that are crucial to a nation’s modern economy, for example, electrical, oil, energy nodes, and transportation hubs. Customary laws of war prohibit attacks against purely civilian targets, so this subset requires further limitation to those industries that support war efforts.<sup>109</sup> The goal of targeting this subset “would be to have the ability to inflict sufficient damage, that is, impose costs and pains on a nation, which will outweigh any potential benefit that a future enemy might expect from a nuclear attack on the United States.”<sup>110</sup> Strikes against these extended countervalue targets require a deeper exploration of the ‘bonus’ discussion from earlier. Regardless, if the U.S. wishes to embrace an MDS, it must be clear as to what extent its plans and arsenal are scoped with respect to the breadth of possible countervalue targets.

### Conclusions

From Chapter 1 and subsequent exploration, a nation embracing a true MDS holds to a few qualities. First, it has no need for a first-strike capacity. Such a strategy requires that the nation’s arsenal be secure and composed of forces designed for second-strike retaliations. Second, it does not need to destroy enemy nuclear forces—its limited arsenal dictates that it subscribe to countervalue targeting. Third, policymakers hold nuclear weapons as “instruments of last resort” and thus have a minimized emphasis in statecraft. Finally, high alert rates are not necessary, except for the invulnerable secure retaliatory force.

Of the four case study nations examined, none hold to a true MDS. China may be the closest, but its proclamation of counterforce targeting takes it beyond a basic countervalue-targeting scheme. Additionally, arsenal modernization efforts coupled with statements about attacking conventional forces countering a Chinese use of force against Taiwan allow for speculation on potential counterforce targeting options. As for the UK and France, both embrace countervalue targeting beyond just population centers. Additionally, the UK holds a number of

<sup>106</sup> Haffa et al., *Deterrence and Defense*, 20.

<sup>107</sup> Haffa et al., *Deterrence and Defense*, 20.

<sup>108</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 31.

<sup>109</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 40. The Federation of American Scientists recommended that minimal deterrence targets include those power plants that explicitly produce electricity for key military industrial facilities, not power plants generally.

<sup>110</sup> Kristensen et al., *From Counterforce to Minimal Deterrence*, 31.

counterforce targets at risk thanks to policy statements supported by the accuracy of the Trident D5 SLBM. In addition, the UK offers extended deterrence coverage to NATO and thus holds an arsenal to support those obligations. India's near existential strategy serves in opposition to these three 'minimum-plus' strategies. However, India's targeting scheme holds true to countervalue, but adds a caveat of "overwhelming" which transmits a contradiction to minimum.

At present, the U.S. communicates an employment strategy of both first and second-strike, a targeting scheme of both counterforce and countervalue targets, and the offer of extended deterrence to over 30 nations. It owes this luxury to its maximum deterrence strategy and accompanying arsenal. The U.S. adoption of an MDS would require considerable examination as to which sub-options of employment strategy, targeting scheme, and the offers of extended deterrence would remain. Regardless of the outcome, policymakers must effectively communicate the capabilities of the U.S. arsenal and the will to use it to those involved in U.S. deterrence relationships.



## Chapter 4

### Communicating with Adversaries

*...within a state's calculation of nuclear strategy, the three concepts [capability, declaratory strategy, and targeting] are interrelated: capability influences choice of strategy and vice versa, and capability and strategy influence target priorities.*

– Dennis M. Drew and Donald M. Snow,  
*Making Twenty-First-Century Strategy*

As the previous chapters have discussed, deterrence is a formal/informal contract between two parties to maintain a given status quo. If either party breaks the status quo, the perpetrator is to incur an implied (or threatened) penalty by the deterrer. Because this is a perceived contract, communicated by both word and deed, it relies on messaging that conveys a nation's nuclear credibility. As noted previously, credibility is the product of capability and will.<sup>1</sup> Most often, physical means communicates a nation's capability (*e.g.*, nuclear test detonations, delivery vehicle test launches, and demonstrated alert readiness). In contrast, the communication of will is more of psychology and left to the written and verbal deliveries of national leaders.

This chapter explores deterrence through examining how each country communicates the two factors of credibility. Before beginning the exploration, it seems necessary to conduct a brief review of credibility from a communications slant. The first factor of credibility, capability, only works when the adversary knows something about the weapons used to threaten him.<sup>2</sup> While weapons possession is necessary for capability, truly their *reputation* poses the deterrence threat. Additionally, if called upon, the results from the use of weapons coerce, not the weapons themselves.<sup>3</sup>

To prevent the transition from deterrence to coercion, the adversary must understand the deterring reputation of the nation's arsenal. The adversary must appreciate both the destructive power of nuclear weapons and the deterrer's ability to deliver them. In short, one's adversary must understand/believe the power of these weapons, see that weapons function as advertised (or that the adversary thinks they will), and that the coercer can deliver its weapons as advertised.

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<sup>1</sup> Borrowing terms from mathematics, factors are the values multiplied together and the result is the product: Factor \* Factor = Product.

<sup>2</sup> Rajesh M. Basrur, Michael D. Cohen, and Ward Wilson, "Do Small Arsenals Deter?," *International Security* 32, no. 3 (Winter 2007/08): 211.

<sup>3</sup> Basrur et al., "Do Small Arsenals Deter?," 211. One of the characteristic mistakes of the nuclear debate is to talk about means (*i.e.*, nuclear weapons) rather than ends (*e.g.*, destroyed cities, blown-up silos, and radiation trails).

Therefore, capability is now less about the destructive force of the weapons and more about a nation's ability to deliver them, both accurately and timely.

The second factor of credibility, will, is more soft science and social contract. Will focuses on the desire, the intent of use. No one wishes for nuclear weapons use. Therefore, deterrence rests on the premise that an adversary will not act in a manner to change the status quo. If the adversary does act, and transitions to perpetrator, the deterrer is obligated to conduct the communicated coercive acts to restore the status quo. A lack of action by the deterrer reduces if not negates their credibility. If their will to act or the perception of willingness drops to zero, no matter how great their capability, the product could net a credibility of zero.

To prevent an escalation to coercion, two things must happen. First, the adversary must understand the deterrer's threats and communications. Second, they must value greatly the types of targets the deterrer can threaten.<sup>4</sup> Otherwise, an arsenal's capability to threaten specific target sets will mean little or nothing.<sup>5</sup>

In contrast to the West's bifurcation of deterrence and compellence, the Chinese view on deterrence takes a more holistic approach. The Chinese text, *The Science of Military Strategy* (*Zhanlue Xue*), captures the spirit of the credibility product and an understanding of the deterrence to coercion transition by the term *weishe*. *Weishe* embodies *both* deterrence *and* compellence [coercion] through the understanding that it is "the display of military power, or the threat of use of military power, in order to compel an opponent to submit."<sup>6</sup> *Weishe*'s relation to Western views on deterrence comes from two conditions. The first is by its requirement of transmitting to an opponent the existence of actual strength (*i.e.*, capability). The second is by transmitting the determination to use that strength (*i.e.*, will). *Weishe*, like credibility, is as much psychology as it is capability, but includes the flow from credible deterrence to credible coercion.<sup>7</sup>

This chapter explores how nuclear weapons states have communicated the two factors of the credibility product, and goes on to suggest communications considerations for a U.S. adoption of an MDS. The chapter first explores how nations generally communicate their nuclear deterrence credibility. It then examines how each of the MDS case study nations communicates their respective deterrence credibility. Subsequently, it briefly reviews Soviet Union/Russian and

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<sup>4</sup> Keith B. Payne, "Maintaining Flexible and Resilient Capabilities for Nuclear Deterrence," *Strategic Studies Quarterly* 5, no. 2 (Summer 2011): 14.

<sup>5</sup> Payne, "Maintaining Flexible and Resilient Capabilities," 14.

<sup>6</sup> Dean Cheng, "Chinese Views on Deterrence," *Joint Forces Quarterly* 1st quarter, no. 60 (January 2011): 92.

<sup>7</sup> Cheng, "Chinese Views on Deterrence," 93.

U.S. superpower deterrence communications. Finally, the chapter concludes with suggestions for U.S. MDS deterrence communications.

### **General Nuclear Deterrence Communications**

“A country’s *declaratory strategy* is its stated plan for using nuclear weapons in the perceived imminence or actuality of a nuclear war.”<sup>8</sup> Most nations will state or publish their declaratory strategy as a means of delineating redlines to their adversary.<sup>9</sup> The declaratory strategy links capability with the messaging of the how and when of retaliation. The relationship between capability and declaratory strategy is interrelated and interdependent. The declaratory strategy a country wishes to follow places two influences on capability: the arsenal composition and firing, or as used in this study – targeting, strategy.<sup>10</sup> As explored in Chapter 3, this combination leads to determining targeting priorities and decisions about employment strategies, specifically countervalue or counterforce.

Implied from the chapter’s introduction, capability is easier to convey than will. Will requires greater communications and cognition. While coercion or compellence outcomes are arguably costlier than those of deterrence, deterrence is doomed to failure when the character of the punishment for noncompliance is misunderstood.<sup>11</sup> For example, compellence did not work in the Pacific in 1945, but today the threat of nuclear destruction to New Delhi or Islamabad is likely to deter Indian or Pakistani aggression, at least aggression that threatens one or the other’s national survival.<sup>12</sup> Additionally, there were several indicators in 1991 that the Iraqis understood the threat of retaliation to WMD attacks, to include the use of nuclear weapons.<sup>13</sup> These two examples highlight how both key characteristics of will—communications and cognition—are necessary for effective deterrence. Though communicated, the Japanese, through no fault of their own, had no appreciation of the destructive capabilities of nuclear weapons. Their cognition was lacking and thus deterrence failed. In contrast, nearly 50 years of nuclear testing and Cold War alerts educated the Iraqis on the deadly nature of a nuclear response. Nations assume that

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<sup>8</sup> Dennis M. Drew and Donald M. Snow, *Making Twenty-First-Century Strategy: An Introduction to Modern National Security Processes and Problems* (Maxwell AFB, AL: Air University Press, 2006), 172.

<sup>9</sup> Stephen J. Cimbala, “Matrix of Nonlinearity: Minimum Deterrence, Missile Defenses, and Nuclear Arms Reductions,” *Joint Forces Quarterly* 3rd quarter, no. 62 (July 2011): 112. A state’s declaratory strategies are not always consistent with their operational policies.

<sup>10</sup> Drew and Snow, *Making Twenty-First-Century Strategy*, 175. The authors use the term “firing strategy” in substitution for targeting strategy (*e.g.*, countervalue, counterforce). The author elects to use targeting strategy to maintain document continuity.

<sup>11</sup> Basrur et al., “Do Small Arsenals Deter?,” 208.

<sup>12</sup> Basrur et al., “Do Small Arsenals Deter?,” 210.

<sup>13</sup> Lawrence Freedman, *The Evolution of Nuclear Strategy*, 3rd ed. (Basingstoke: Palgrave Macmillan, 2003), 449.

adversaries recognize their nuclear deterrence capabilities; however, it is the communication of will that remains open to interpretation.

Successful deterrence requires the communication of general adversarial redlines.<sup>14</sup> By contrast, the public disclosure of precisely what would be the scope of military action if aggression occurred is discouraged.<sup>15</sup> As Lawrence Freedman notes “[T]hat is a matter as to which the aggressor had best remain ignorant.”<sup>16</sup> The intentional lack of detail creates a declaratory strategy termed *calculated ambiguity*.<sup>17</sup> While there have been examples of declaratory strategies that provided great clarity in the description of deterrent threats (see NSC-162/2), most nations maintain a posture akin to Dulles’ ‘brinkmanship.’<sup>18</sup> Brinkmanship opts for ambiguity and hints at a posture whereby the deterrer forces caution onto the potential aggressor, leaving the aggressor uncertain as to how far to the ‘brink’ the deterrer would be willing to go.<sup>19</sup> This intentionally vague messaging of the deterrence to coercion transition point (redline) is believed to have contributed to there being no nuclear exchanges resulting from failed deterrence.

### **MDS Nations’ Communications**

The study reviewed each MDS nation for communications about both its capabilities and its will to use them. The segmentation of credibility does not stop with these two categories. Further subdivision of each category grows a greater appreciation for the nuances of deterrence communications. Capability partitions include arsenal size and composition, strike options, maintenance and infrastructure (or enterprise) efforts, and a general value placed by the population on the nuclear force. Partitions of national will include qualitative communications on the potential use of an arsenal, the how and why to response initiation, the codification of views and doctrines, and any limits placed on the use of the arsenal’s weapons. Not every nation

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<sup>14</sup> Amy F. Woolf, Nuclear Weapons in U.S. National Security Policy: Past, Present, and Prospects, Prepared for Members and Committees of Congress (Washington, DC: Congressional Research Service, updated 28 January 2008), CRS 18-19. “[U.S.] Administration officials argue that, to be credible, deterrent threats must be precise, detailed, and specific, so that an adversary will accept that the United States is both willing and able to implement the plans. Some analysts have argued that such precision is not a key to credibility. Some have argued that no threats to use nuclear weapons, no matter how specific or limited, would be credible because such an attack would produce “disproportionate and unacceptable collateral destruction and severe political fallout.” (For more, see Daryl G. Kimball, “Of Madmen and Nukes,” Arms Control Today, November 2005.) Because such use would be so horrific, no adversary would believe the United States would be willing to launch a nuclear attack unless its very national survival were at stake. Others have argued that such precision is unnecessary because the mere existence of nuclear weapons and the means to deliver them could serve as sufficient deterrent.”

<sup>15</sup> Freedman, *The Evolution of Nuclear Strategy*, 82.

<sup>16</sup> Freedman, *The Evolution of Nuclear Strategy*, 82.

<sup>17</sup> Nick Ritchie, “Deterrence Dogma? Challenging the Relevance of British Nuclear Weapons,” *International Affairs* 85, no. 1 (2009): 82. The logic of nuclear deterrence suggests that threats need not be specific since “even a modest chance of a huge penalty can have great deterrent force”.

<sup>18</sup> Freedman, *The Evolution of Nuclear Strategy*, 82.

<sup>19</sup> Freedman, *The Evolution of Nuclear Strategy*, 82.

provides messaging for each of these partitions. Some nations provide intentionally vague or ambiguous messages, while others provide no messages, leaving adversaries to wonder where redlines are drawn and what responses may be expected if those lines are crossed.

### **The United Kingdom**

Of the four case study MDS nations reviewed, the UK's communications capability is exemplary in both word and deed. In word, the UK states its intent to maintain a minimal nuclear force that would only be used in "the most extreme circumstances of self defence," including the defense of NATO allies.<sup>20</sup> In May 2010, Foreign Secretary William Hague enhanced the views on the UK retaining an MDS nuclear arsenal by stating the British intend to possess a total stockpile of no more than 225 nuclear warheads.<sup>21</sup> Furthermore, Labour's strategic defense review (SDR) stated the number of operationally available warheads was to be less than 200.<sup>22</sup> In application, this policy reduced the number of missiles and accompanying warheads carried by the submarine-only monad to no more than 180 warheads.<sup>23</sup> The remaining arsenal would be approximately thirty percent of its peak size, placing its delivery capacity at the equivalent of about 20-30 megatons.<sup>24</sup> This would leave Britain with the smallest stockpile of all the satisfied nuclear powers, with a total yield representing less than 1 percent of the global total.<sup>25</sup>

In contrast, by deed, the UK communicates the execution of its MDS through physical markers. Primarily, the UK has elected to keep one submarine always on patrol. In pursuing an MDS, UK policy is that the lone submarine would operate on a "reduced day-to-day alert state" and possibly with only one crew per boat.<sup>26</sup> Additionally, the missiles would not be on quick reaction alert but kept days away from operational readiness and not targeted.<sup>27</sup> To maintain a stable credibility, the UK government argued for maintaining a continual operational patrol,

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<sup>20</sup> Nuclear Threat Initiative, "Country Profiles / United Kingdom / Nuclear," (last updated: November, 2011), <http://www.nti.org/country-profiles/united-kingdom/nuclear/> (accessed 17 February 2012).

<sup>21</sup> The Secretary of State for Defence and the Secretary of State for Foreign and Commonwealth Affairs, "The Future of the United Kingdom's Nuclear Deterrent," (December 2006), the UK Government, <http://www.mod.uk>. Richard Norton-Taylor, "Britain's nuclear arsenal is 225 warheads, reveals William Hague," *The Guardian*, 26 May 2010, [www.guardian.co.uk](http://www.guardian.co.uk), quoted in Nuclear Threat Initiative, "Country Profiles / United Kingdom."

<sup>22</sup> Lawrence Freedman, "British Perspectives on Nuclear Weapons and Nuclear Disarmament," *Unblocking the Road to Zero Nuclear Security Series*, no. France and the United Kingdom (February 2009): 30.

<sup>23</sup> *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review*, Her Majesty's Government, (October 2010), <http://www.direct.gov.uk>, 38, quoted in Nuclear Threat Initiative, "Country Profiles / United Kingdom." The most recent U.K. [SLBM] reductions were outlined in the 2010 nuclear submarine from 48 to 40, to reduce the number of total operational warheads from 160 to 120, and to reduce the overall stockpile to no more than 180 nuclear warheads.

<sup>24</sup> Freedman, "British Perspectives on Nuclear Weapons," 30.

<sup>25</sup> Freedman, "British Perspectives on Nuclear Weapons," 30.

<sup>26</sup> Freedman, "British Perspectives on Nuclear Weapons," 31.

<sup>27</sup> Freedman, "British Perspectives on Nuclear Weapons," 31.

contending that if it did not, a sudden return to sea could aggravate a crisis by appearing provocative.<sup>28</sup>

Reductions in submarines, missiles, warheads, and patrols might lead to questioning the UK's nuclear capability. A government announcement for an "extensive research programme to assure the safety and effectiveness of the warhead stockpile" sought to allay those concerns.<sup>29</sup> A 2006 Labour [British Labour Party] government-produced White Paper stated the case for retention of the nuclear deterrent. The view was that a country of Britain's economic strength must afford the relatively small research and operations costs if it considered nuclear weapons essential to its security.<sup>30</sup> Efforts to maintain a capable arsenal should allow the British to maintain its current warhead [based on the American W76 design] in service into the 2020s.<sup>31</sup> This service life extension displays an obligation to preserve nuclear weapons maintenance and infrastructure, communicating a commitment to a continued capability.

While the UK maintains clarity in communicating its capability, messages about its will are more opaque. The UK remains explicit in their belief that nuclear weapons guarantee national security, guard against unintended advantage or threat of coercion, and force an adversary to weigh costs versus gains.<sup>32</sup> Defence Secretary Rifkind provided crystal clarity on national will by stating, "nuclear use would only be credible, justifiable and proportionate when 'vital national interests were at stake.'"<sup>33</sup> Additionally, the 2010 Strategic Defense and Security Review (SDSR) stated that the UK will retain a degree of calculated ambiguity by remaining "deliberately ambiguous about precisely when, how and at what scale" it would contemplate the use of its nuclear weapons.<sup>34</sup> While these statements portray confidence by the UK in their nuclear response rationale, adversaries may not share that same confidence. This adversary lack of faith questions whether the UK will respond without either getting approval from or being directly supported by the U.S.

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<sup>28</sup> Freedman, "British Perspectives on Nuclear Weapons," 31.

<sup>29</sup> Freedman, "British Perspectives on Nuclear Weapons," 33.

<sup>30</sup> Freedman, "British Perspectives on Nuclear Weapons," 31. Relatively small is quantified as £25 billion (approximately \$40.5 billion) over twenty years.

<sup>31</sup> Freedman, "British Perspectives on Nuclear Weapons," 33.

<sup>32</sup> "Our defence strategy will continue to be underpinned by nuclear forces as the ultimate guarantee of our country's security. Nuclear weapons guard against any attempt by an adversary to gain advantage by threat or coercion. They are also uniquely able to ensure that aggression is not a realistic option, by presenting to a potential aggressor the prospect of a cost that would far outweigh any hoped-for-gain." Defence Secretary Sir Malcolm Rifkind. Freedman, "British Perspectives on Nuclear Weapons," 42.

<sup>33</sup> Freedman, "British Perspectives on Nuclear Weapons," 43.

<sup>34</sup> Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review, Her Majesty's Government, (October 2010), <http://www.direct.gov.uk>, 37, quoted in Nuclear Threat Initiative, "Country Profiles / United Kingdom."

The UK faces a unique deterrence situation due to its strong ties to the United States in many other elements of its security policies.<sup>35</sup> To maintain its communicated will of use, the UK deterrent must convey independence from the U.S. on issues of vital national interest.<sup>36</sup> If this independence fails to be communicated and appreciated, adversaries may consider pressing the UK's resolve to respond when U.S. actions may not be supportive of British policy. Additionally, adversaries may exploit the UK's nuclear support to NATO and question a response when actions do not place vital UK interests at stake.

Complicating the UK's will of nuclear weapons use is a mixed message about responding to non-nuclear weapon states. The 2010 SDSR, for the first time, gave assurance that the UK "will not use or threaten to use nuclear weapons against non-nuclear weapon states that are signatories to the NPT."<sup>37</sup> Additionally, the review also emphasizes that these assurances do not apply to any state deemed to be "in material breach" of its nonproliferation obligations.<sup>38</sup>

Confusion arises in interpreting the inverse of these statements: the UK will use or threaten to use nuclear weapons against nuclear state signatories of the NPT (U.S., Russia, France, China), against nuclear non-signatory states (India, Pakistan, Israel, and North Korea), or against non-nuclear weapon non-signatory states (none known).<sup>39</sup> Additionally, any state participating in nuclear proliferation has lost its no-strike assurance, regardless of NPT signatory status. That the UK reserves the right to strike nuclear weapons states or in response to discovered nuclear proliferation activities is clear, but the UK conveys confusion over striking states withdrawn from the NPT maintaining conventional-only capabilities.<sup>40</sup>

The UK has left intentionally vague the actual situations in which it would employ nuclear weapons. Additionally, it is unclear if the UK would employ unilaterally without U.S. support. While the UK clearly communicates its capability, its will to use its arsenal seems constrained by support from, or fellow employment by, the U.S. While the vagueness of

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<sup>35</sup> One reason for UK nuclear weapons development was to create an alternate Cold War decision-making center. The theory was that by establishing two entirely independent centers of decision making, the Soviet Union would have to consider a possible response from both London and Washington should it decide to carry out a first strike.

<sup>36</sup> Nuclear Threat Initiative, "Country Profiles / United Kingdom."

<sup>37</sup> Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review, Her Majesty's Government, (October 2010), <http://www.direct.gov.uk>, 37, quoted in Nuclear Threat Initiative, "Country Profiles / United Kingdom."

<sup>38</sup> Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review, Her Majesty's Government, (October 2010), <http://www.direct.gov.uk>, 38, quoted in Nuclear Threat Initiative, "Country Profiles / United Kingdom."

<sup>39</sup> Federation of American Scientists, "Treaty on the Non-Proliferation of Nuclear Weapons [NPT]," edited by Alicia Godsberg (18 April 2008), <http://www.fas.org/nuke/control/npt/> (accessed 29 April 2012).

<sup>40</sup> Freedman, "British Perspectives on Nuclear Weapons," 43. By inference, it seems that there could be a policy not to use nuclear weapons against nations armed with only conventional forces.

calculated ambiguity provides pause, it also leaves open to question the UK's will to employ nuclear weapons.

## France

In comparison to the UK, France is mum regarding communications on capabilities. France relies on the assumption that its adversaries understand its capabilities, and thus provides open commentary only on its will of use. This is a risky assumption, that your adversaries have an appreciation for your capabilities. In France's defense, there has been no failure of its deterrence. France's adversaries have appreciated whatever unwitting communications exists about her capabilities.

For France, the key issue was never the balance between nuclear forces, but the sufficiency of forces creating the credibility of their implied threat. France relies on a principle of "sufficiency" to achieve its nuclear-related national political and strategic objectives.<sup>41</sup> In March 2008 President Sarkozy provided a rare overt communication regarding French capabilities announcing that France's current nuclear arsenal held less than 300 weapons and that this figure was the *total* number of warheads in the stockpile, not just its "operationally available weapons."<sup>42</sup> Reinforcing communications about France's capabilities are results from a 2006 poll indicating that 61 percent of the population believes the nation requires nuclear weapons to defend itself.<sup>43</sup> France's sparse communications as to its nuclear capability is offset by clearer French communications towards an appreciation of its will; specifically, when and how they may respond.

France shoulders the same risk as the UK regarding its will to use nuclear weapons by maintaining a degree of calculated ambiguity.<sup>44</sup> Akin to the UK, French nuclear weapons doctrine states that an attack on its vital interests would bring about a nuclear response. In 2008, President Sarkozy referred to the potential use of nuclear weapons as being possible only in

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<sup>41</sup> Camille Grand, *France and Nuclear Stability at Low Numbers, Small Nuclear Forces: Five Perspectives* Whitehall Report 3-11 (London: Royal United Services Institute for Defence and Security Studies, December 2011), 28.

<sup>42</sup> Bruno Tertrais, "French Perspectives on Nuclear Weapons and Nuclear Disarmament," *Unblocking the Road to Zero Nuclear Security Series*, no. France and the United Kingdom (February 2009): 11.

<sup>43</sup> While French opinion polls on this subject are rare, one conducted by the Department of Defense in 2006 found that 61 percent of the population believes France requires nuclear weapons in order to defend herself. [The Ministry of Defence, *Les Français et la Défense*, 2006, in Bruno Tertrais, "La dissuasion nucléaire en 2030," *Foundation pour la Recherche Stratégique*, (December 2006), <http://www.frstrategie.org>, 40. Individuals were asked "Could a country like France defend herself without a deterrence force (nuclear)?" ] quoted in Nuclear Threat Initiative, "Country Profiles / France / Nuclear," (last updated: November, 2011), <http://www.nti.org/country-profiles/france/nuclear/> (accessed 17 February 2012).

<sup>44</sup> Nuclear Threat Initiative, "Country Profiles / France."

“extreme circumstances of self-defense.”<sup>45</sup> As to exactly what constitutes national ‘vital’ interests is unclear, but analysts generally describe it as including the free exercise of sovereignty, national territorial integrity, and the integrity of its overseas territories. Regardless, a response to an attack would be in the form of “unacceptable damage,” regardless of the nature of the threat, the identity of the state concerned, or the means employed.<sup>46</sup>

Unlike the U.S., France does not mix nuclear and conventional deterrence in its statements of how it will respond to threats. French policy clearly states that deterrence refers to nuclear deterrence.<sup>47</sup> Additionally, France holds considerable reservations on the relevance of “conventional deterrence” as a possible substitute for nuclear weapons.<sup>48</sup> French authorities (including President Chirac in 2006) regularly reaffirm that their nuclear forces are solely for deterrence and “are in no way war-fighting weapons.”<sup>49</sup> Nuclear war fighting implies an elevation to a limited deterrence strategy, which is not the case for France.

On the other hand, France’s will to use its arsenal is similar to the U.S. position specifying consideration for nuclear weapons employment against other forms of WMD. Starting in 1992, official French texts and speeches began mentioning consideration for treating all forms of WMD as in-kind threats. Policy adapted the use of nuclear deterrence for protecting French vital interests against not only nuclear threats, but also other forms of WMD.<sup>50</sup> What then came into question was whether France would employ nuclear weapons in response to state-sponsored chemical, biological, radiological, or nuclear terrorism.<sup>51</sup> At present, the answer is no. The latest thoughts are that France’s nuclear weapons have utility as a deterrent only against state actors and that only these actors warrant consideration with regard to nuclear deterrence.<sup>52</sup>

## India

India’s credibility communications are haphazard and confused. Though statements exist describing India’s arsenal as having de-mated weapons and low alert rates, the Indian government has conveyed nothing official. As of 2011, India had not made an official claim as to its nuclear

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<sup>45</sup> Tertrais, “French Perspectives on Nuclear Weapons,” 8-9.

<sup>46</sup> Tertrais, “French Perspectives on Nuclear Weapons,” 7.

<sup>47</sup> Tertrais, “French Perspectives on Nuclear Weapons,” 8.

<sup>48</sup> Tertrais, “French Perspectives on Nuclear Weapons,” 8.

<sup>49</sup> Tertrais, “French Perspectives on Nuclear Weapons,” 8. In a rare discussion of French nuclear capabilities, the then-Chief of the Defense Staff (2006) let it be known that a minimum yield for new weapons had been fixed in order to make it clear that France was not adopting a war-fighting strategy.

<sup>50</sup> Tertrais, “French Perspectives on Nuclear Weapons,” 3.

<sup>51</sup> Nuclear Threat Initiative, “Country Profiles / France.”

<sup>52</sup> Bruno Tertrais, “The Last to Disarm? The Future of France’s Nuclear Weapons,” *Nonproliferation Review* 14, no. 2 (July 2007), 253, quoted in Nuclear Threat Initiative, “Country Profiles / France.”

capabilities.<sup>53</sup> Some may argue that India is following the French example of limited capability communications. The comparison is a poor one as France routinely demonstrates some of its capabilities (*e.g.*, sortieing submarines, exercising aircraft). India, with rare exception, does not demonstrate any form of capability, much less ones that would demonstrate credibility. It leads one to assume that India is relying heavily on a communication of will to demonstrate deterrence credibility.

Standing starkly at the crossroads between capability and will, India's published nuclear doctrine lacks clarity. The August 1999 release of the Draft Nuclear Doctrine (DND; later adopted as official policy) "represents not so much a clear articulation of strategy as a congeries of diverse views cobbled together for public airing. It gives a minimalist call for non-deployment, no-first-use and arms control, but simultaneously flags a maximalist approach in advocating the building of multiple redundancies to ensure the survivability of forces."<sup>54</sup> While strategic communication may deceptively lead adversaries to believe one thing while the nation's leaders believe otherwise, this postulate does not hold for India. Through several conversations with Indian civil officials, author Rajesh Basrur has found they "are unclear about the concept of minimum deterrence."<sup>55</sup> India's will for use is under considerable question.

The lone positive to India's ability to communicate effectively its will comes from variations on the no-first-use policy. The BJP-led government professed doctrine of "retaliation only" centers on deterring the threat of nuclear weapons use by any state or entity against India or its armed forces.<sup>56</sup> The recent expansion to include deterring against chemical and biological weapons threats forced a policy modification.<sup>57</sup> Regardless of WMD threat type, in the event of failed deterrence, India's doctrine requires a punitive retaliatory strike that inflicts unacceptable losses on the adversary state or entity.<sup>58</sup> These unacceptable losses draw parallel to France's "unacceptable damage" and go beyond their limitation to nation-only adversaries.

Much like the UK, India holds to a restriction of withholding threats to and strikes against states that do not possess nuclear (now also chemical and biological) weapons.<sup>59</sup> It is through

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<sup>53</sup> Nuclear Threat Initiative, "Country Profiles / India / Nuclear," (last updated: November, 2011), <http://www.nti.org/country-profiles/india/nuclear/> (accessed 17 February 2012).

<sup>54</sup> Rajesh Basrur, "Indian Perspectives on the Global Elimination of Nuclear Weapons," *Unblocking the Road to Zero Nuclear Security Series*, no. China and India (March 2009): 12. The most elaborate statement of minimum deterrence doctrine made so far, an interview given by then External Affairs Minister Jaswant Singh in 1999, reflected the same ambivalence.

<sup>55</sup> Rajesh Basrur, "Indian Perspectives," 12.

<sup>56</sup> Nuclear Threat Initiative, "Country Profiles / India."

<sup>57</sup> Nuclear Threat Initiative, "Country Profiles / India."

<sup>58</sup> Nuclear Threat Initiative, "Country Profiles / India."

<sup>59</sup> Nuclear Threat Initiative, "Country Profiles / India."

clarity of these last few points that provides India with some value to will of use, and consequently, contributes some value to its nuclear credibility.

## China

Chinese deterrent communications have been minimal, to say the least.<sup>60</sup> A combination of maintained ambiguity and secrecy, a professed distaste for nuclear weapons, and a latency of thought on deterrence have kept Chinese views sheltered from others.<sup>61</sup> Available sources indicate that it took nearly 20 years for the Chinese to develop a significant nuclear deterrence doctrine, and then another 20 years for it to become available to Western nations.<sup>62</sup> Therefore, over the last decade the US has learned much about Chinese nuclear deterrence evolution due to the availability of doctrine documents serving as proxy communications channels.

China's original deterrence communications focused on a minimum force embracing a notion of mutual strategic deterrence.<sup>63</sup> The minimum force draws roots from statements by Mao Zedong. He suggested that a few weapons would be sufficient for deterrence, and that China would use its limited atomic arsenal as a defensive weapon.<sup>64</sup> Deng Xiaoping supported this

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<sup>60</sup> M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security* 35, no. 2 (Fall 2010): 52. "Any assessment of Chinese leaders' beliefs about the utility of nuclear weapons and the requirements of deterrence must begin with the observation that primary source data remain scarce but are growing... military and security issues are among the most challenging because of the limited access to government documents and leadership statements. And within the study of Chinese military and security affairs, problems of data availability are most acute regarding nuclear issues, in part a reflection of China's decision to maintain ambiguity regarding multiple attributes of its force.."

<sup>61</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," 52. "A [second] broad constraint on the development of China's nuclear strategy and forces was the existence of a closed political environment that suppressed discussion and debate on such issues... both weapons development and doctrine were treated with intense secrecy for decades.."

<sup>62</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," 76. "Authoritative PLA publications indicate that by the early 2000s the Second Artillery had completed a "basic system of military theory" for nuclear operations. PLA materials clearly identified and developed, for the first time, the Second Artillery's "nuclear counterstrike campaign" (he fanji zhanyi). PLA materials clearly identified and developed, for the first time, the Second Artillery's "nuclear counterstrike campaign" (he fanji zhanyi)... PLA texts specifically identified houfa zhiren (striking after the enemy has struck) as a basic guiding principle for Second Artillery operations.."

<sup>63</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," 60. "During a speech to the Central Military Commission in 2002, Jiang Zemin stated, "International society attaches more and more importance to containing war or delaying the outbreak of war, and avoiding or reducing the devastation of war, through strategic deterrence (zhanlue weishe). Strategic deterrence has already become an important part of international military competition. The United States, Russia, Britain, France, and other nuclear powers all regard nuclear weapons as the core force of strategic deterrence." Authoritative articles by senior military scholars have continued to stress this view of nuclear weapons since Hu [Jintao] became general secretary of the CCP in 2002."

<sup>64</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," 63. In 1960 Mao suggested that a few weapons would be sufficient for deterrence, stating, "Our country in the future may produce a few atomic bombs, but we by no means intend to use them. Although we do not intend to use them, why produce them? We will use them as a defensive weapon." A few months after China's successful first nuclear test, Mao observed in an interview with Edgar Snow, "We don't wish to have too many atomic bombs

view with statements addressing China's retention of only a few weapons as a restraining force (*zhiyue lilian*).<sup>65</sup> After China's first test of a nuclear device in October 1964, Mao announced his embrace of a mutual strategic deterrent through the enactment of two policies (*zhengce*) guiding China's approach to nuclear weapons: a renunciation of the first-use option and opposition to arms races.<sup>66</sup> China attempted to stretch its deterrence credibility by blending a no-first-use policy with a minimum arsenal built intending not to waste too much money on unusable weapons.<sup>67</sup>

Through a combination of maturing thought and open communications, Chinese deterrence intentions have become clearer as of late. A 2006 white paper makes special mention that China continues to seek to "maintain a nuclear strategic deterrent" (*baochi he lilian de zhanlue weishe zuoyong*).<sup>68</sup> The most recent official documents show China's intent to continue pursuing a "self-defensive nuclear strategy" (*ziwei fangyu he zhanlue*).<sup>69</sup> While reiterating the original *zhengce* (two policies), the addition of "counterattack in self-defense" (*ziwei fanji*) and "limited development" of nuclear weapons (*youxian fazhan*) options add clarity to Chinese




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ourselves. What would we do with so many? To have a few is just fine." Chinese deployments are consistent with the belief that the security benefit from nuclear weapons increases much more quickly after a state acquires a small nuclear capability, and that additional capability confers little benefit, quoted in Jeffrey G. Lewis, "Minimum Deterrence," *Bulletin of the Atomic Scientists* 64, no. 3 (July/August 2008): 10-11.

<sup>65</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," 63. Deng Xiaoping offered the most complete statement of Chinese leadership beliefs about nuclear deterrence... "We have a few nuclear weapons. France also has a few. These weapons themselves are useful only for [creating] pressure. We have said many times that is the point of our few nuclear weapons! Only to show that we also have what they have. If they want to destroy us, they themselves will also suffer some retaliation. We have consistently said that we want to force the superpowers not to dare to use nuclear weapons. In the past, this was to deal with the Soviet Union, to force them not to use these weapons rashly. To have even only a few weapons after all is a kind of restraining force (*zhiyue lilian*)."

<sup>66</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," 56. "renunciation of the first-use option" attributed to Sr Col Yao Yanzhu, "China's Perspective on Nuclear Deterrence," *Air & Space Power Journal* XXIV, no. 1 (Spring 2010): 29.

<sup>67</sup> Yanzhu, "China's Perspective on Nuclear Deterrence," 29.

<sup>68</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," 77.

<sup>69</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," 77. A Chinese national defense white paper published in 2000 attempted to articulate the country's nuclear strategy. A 2006 and 2008 set of white papers followed, making the most complete official explanations of China's nuclear strategy.

strategy.<sup>70</sup> One further caveat adds refinement to the self-defense counterattack policy by making clear that this action is only for acts against a nuclear-armed state or conflicts involving Taiwan.<sup>71</sup>

Probably the best summation of China's communicated deterrence intentions comes from the following December 2006 statement describing its "defensive nuclear strategy."<sup>72</sup>

China's nuclear strategy is subject to the state's nuclear policy and military strategy. Its fundamental goal is to deter other countries from using or threatening to use nuclear weapons against China. China remains firmly committed to the policy of no first use of nuclear weapons at any time and under any circumstances. It unconditionally undertakes not to use or threaten to use nuclear weapons against nonnuclear-weapon states or nuclear-weapon-free zones, and stands for the comprehensive prohibition and complete elimination of nuclear weapons. China upholds the principles of counterattack in self-defense and limited development of nuclear weapons, and aims at building a lean and effective nuclear force capable of meeting national security needs. It endeavors to ensure the security and reliability of its nuclear weapons and maintains a credible nuclear deterrent force.

## Others

As a brief comparison to the satisfied and restrained arsenals, this section explores the communications of an embattled arsenal (Pakistan), a former arsenal (South Africa), and a questioned arsenal (Israel). First, Pakistan's pursuit of nuclear weapons lies in successive conflicts with India. Through successive decades, Pakistan glacially pursued its nuclear capabilities. Statements such as Pakistani President Z. A. Bhutto's 1966 "even if Pakistan had to eat grass, we will make the bomb"<sup>73</sup> communicated a Pakistani post-existential nuclear credibility. Its December 1971 defeat spurred Bhutto to instruct the country's nuclear establishment to build a nuclear device in three years.<sup>74</sup> However, it was not until the successful

<sup>70</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," 76. The 2008 white paper reiterated that China remains committed to its policy of unconditional no first use and that China will never enter into an arms race with any other country, quoted in Fravel and Medeiros, "China's Search for Assured Retaliation," 77. Additionally, it roughly outlines several stages of nuclear alert, quoted in Nuclear Threat Initiative, "Country Profiles / China / Nuclear," (last updated: December, 2011), <http://www.nti.org/country-profiles/china/nuclear/> (accessed 17 February 2012).

<sup>71</sup> William J. Perry, Brent Scowcroft, and Charles D. Ferguson, U.S. Nuclear Weapons Policy: Independent Task Force Report No. 62, Independent Task Force Report (New York, NY: Council on Foreign Relations, 2009), 43.

<sup>72</sup> Perry et al., U.S. Nuclear Weapons Policy, 43-44.

<sup>73</sup> Nuclear Threat Initiative, "Country Profiles / Pakistan / Nuclear," (last updated: December, 2011), <http://www.nti.org/country-profiles/pakistan/nuclear/> (accessed 17 February 2012).

<sup>74</sup> Nuclear Threat Initiative, "Country Profiles / Pakistan."

May 1998 tests that Pakistan was able to declare nuclear weapons status.<sup>75</sup> Pakistan's communications of credibility focused primarily on its acquisition of capability.

In association, South Africa's communications also focused on its capability and not on its will of use. As discussed in previous chapters, South Africa's nuclear program maintained great secrecy. It would not be until redlines were crossed that the country's leaders would communicate their nuclear capabilities. Those redlines were never crossed, and following the August 1998 ceasefire between South Africa, Cuba, and Angola, South Africa's possession of nuclear weapons was announced along with their intention to dismantle them. Roelof Frederik "Pik" Botha, the South African foreign minister, announced that his nation had "the capability to make one [a nuclear weapon]" should it want to do so. When reporters asked if South Africa already possessed such a device, Botha refused to elaborate on his statement.<sup>76</sup>

One country that regularly refuses to elaborate on its nuclear weapons capabilities is Israel. The Israeli official posture is one of calculated nuclear ambiguity.<sup>77</sup> In a unique inverse, the Israelis are able to cultivate credibility by *not* announcing capability nor will. For the other two example nations, the credibility communications focus lands squarely in capability. There resides an implication that communicating credibility is deterministic. A nation must first communication capability before will. Crudely, a nation must possess nuclear weapons before they can convey how they might use them. This hypothesis most likely holds for arsenals and strategies ranging from nuclear primacy through post-existential deterrence.

### **Nuclear Superpower Deterrence Communications**

The two nuclear superpowers, having each embraced maximum deterrence strategies, maintain appreciable credibility. Both possess and communicate tremendous capability, even as they downsize their strategic forces under the New START Treaty. Over the course of the Cold War, they each professed a will to use these weapons when conditions dictated. They both went so far as to publicize that they would launch their weapons *before* receiving the effects of an attack on their respective homelands. Through word and deed, both countries adhered to the main characteristic of maximum deterrence—the possession of a force structure paired with operational and declaratory postures that compensate for the perceived lesser credibility of minimum deterrence.

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<sup>75</sup> Nuclear Threat Initiative, "Country Profiles / Pakistan."

<sup>76</sup> Nuclear Threat Initiative, "Country Profiles / South Africa / Nuclear," (last updated: November, 2011), <http://www.nti.org/country-profiles/south-africa/nuclear/> (accessed 17 February 2012).

<sup>77</sup> Group Capt Tim D. Q. Below, "US Nuclear Deterrence: An Opportunity for President Obama to Lead by Example," *Air and Space Power Journal* XXII, no. 4 (Winter 2009): 91.

While an in-depth history of Cold War communications between the U.S. and Soviet Union is beyond the scope of this study, a few present-day examples are worth exploring. The first focuses on declaratory communications by the post-Cold War Russians. First, in parallel to statements made in 2009 by President Obama, the 2010 Russian doctrine appears to reduce the role that nuclear weapons play in their national security policy.<sup>78</sup> However, in a near reversal of roles, the Russians are now leaning on their nuclear arsenal to provide security in place of a weakened conventional force. Official documents suggest that this reliance on nuclear weapons serves as a temporary “fix” until Russian conventional forces have sufficiently modernized and strengthened.<sup>79</sup>

While this may be a tactical level explanation of capabilities, it has not changed Russia’s basic beliefs on will of use. The 2010 military doctrine “allow[ed] for [nuclear weapon] use in situations when ‘the very existence of [Russia] [was] under threat.’” This change has brought Russia’s declaratory policy more in line with the policies of other nuclear weapon states.<sup>80</sup> It has also retained credibility parity between the two nuclear superpowers.

In comparison, many in the U.S. today believe Russia poses no realistic threat of a premeditated nuclear attack.<sup>81</sup> Regardless, the regularly communicated fundamental role of U.S. nuclear weapons is to deter nuclear attacks on the U.S., its allies, and its partners.<sup>82</sup> Akin to the MDS-adopting nuclear nations, the U.S. stresses that it would only consider the use of nuclear weapons in extreme circumstances to defend its vital interests or those of its allies and partners.<sup>83</sup>

As a point of clarity, at present, the U.S. is not prepared to adopt a universal policy of deterring nuclear attacks as the sole purpose of its arsenal. The vagueness of this policy roots in the U.S.’ practice of communicating a strategy of calculated ambiguity.<sup>84</sup> This practice has found valuable credence “when crafting statements to foes armed with chemical and biological

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<sup>78</sup> Nuclear Threat Initiative, “Country Profiles / Russia / Nuclear,” (last updated: December, 2011), <http://www.nti.org/country-profiles/russia/nuclear/> (accessed 17 February 2012).

<sup>79</sup> Nuclear Threat Initiative, “Country Profiles / Russia.” Moscow’s nuclear arsenal will continue to play a significant role in the country’s security for the foreseeable near future. This is due, primarily, to the extent of the task it faces in modernizing its conventional military forces.

<sup>80</sup> Nuclear Threat Initiative, “Country Profiles / Russia.”

<sup>81</sup> Below, “US Nuclear Deterrence,” 91.

<sup>82</sup> Department of Defense, Nuclear Posture Review Report, Recurring NPR (Washington, DC: Department of Defense, April 2010), vii.

<sup>83</sup> Department of Defense, Nuclear Posture Review Report, viii-ix. Additionally, the U.S. adopted a strengthened “negative security assurance” declaring that it will not use or threaten to use nuclear weapons against non-nuclear weapon states that are party to the NPT and in compliance with their nuclear non-proliferation obligations, quoted in Department of Defense, Nuclear Posture Review Report, 46.

<sup>84</sup> Woolf, Nuclear Weapons, CRS-10. U.S. policy statements sometimes offer the semantically different term “studied ambiguity” for calculated ambiguity. This term, consistent with the long-standing U.S. approach, conveys a policy of neither ruling in nor ruling out the possible use of nuclear weapons in any given circumstance.

munitions.”<sup>85</sup> Though ambiguous in detail, the clarity of potential redlines necessitating a U.S. nuclear response provides considerable confidence in a U.S. will of use already backed by a capable arsenal.

A declaratory communications strategy unique to the U.S. and Soviet Union (but not Russia) is the political obligation of extended deterrence. While the first two factors of credibility remain, an additional factor of commitment enters into play.<sup>86</sup> Credibility for extended deterrence now relies on the provider (*i.e.*, defender) to have not only an arsenal capable of response, and the will to respond, but also the commitment to respond when obliged by its political ties to the protégé (*i.e.*, protected nation). This commitment requires the defender to place “skin in the game.”<sup>87</sup> This becomes a point of contention when considering a set of successive retaliations that may result in an attack on Chicago or Washington with the original intent of defending Hamburg or Tokyo.

During the Cold War, the U.S. enhanced the credibility of its extended deterrence commitments by making clear to Soviet leaders that it viewed U.S. national security interests as being at stake along with those of its allies.<sup>88</sup> It is through statements like this that commit the U.S. to come to the defense of allies under nuclear attack. This commitment supports allied views of U.S. extended nuclear deterrence as an important aspect of their security.<sup>89</sup> Knowing that U.S. mainland targets were vulnerable to Soviet nuclear attacks showed considerable commitment to allied defense and by multiplication showed the Soviets a greater U.S. nuclear capability.

### Conclusions

The communications between nations in a traditional two party deterrence contract focus on each nation’s credibility to deter. That credibility rests in their capability and their will of use. The displays of arsenal size or stature communicate a nation’s capability. This may be a weapons system test, a demonstration of increased alert readiness, or the sustainment and modernization of a nation’s arsenal. Communications are more opaque about the will to use nuclear weapons. They tend to come from national leaders who make statements about securing national sovereignty. Determining a nation’s will tends to be difficult since most nuclear nations exercise

<sup>85</sup> Perry et al., U.S. Nuclear Weapons Policy, 16.

<sup>86</sup> Dr. Stephen E. Wright, “Ten Propositions Regarding Extended Nuclear Deterrence” (presentation, 2012 AETC Symposium, San Antonio, TX, January 12, 2012). For extended deterrence, Credibility = Capability \* Will \* Commitment.

<sup>87</sup> Dr. Stephen E. Wright, “Ten Propositions Regarding Extended Nuclear Deterrence” (presentation, 2012 AETC Symposium, San Antonio, TX, January 12, 2012).

<sup>88</sup> David S. Yost, “The US Debate on NATO Nuclear Deterrence,” *International Affairs* 87, no. 6 (2011): 1405.

<sup>89</sup> Perry et al., U.S. Nuclear Weapons Policy, 13.

the declaratory status of calculated ambiguity. This places haziness on will, and thus makes computing a nation's nuclear response credibility difficult.

The material presented above provides a source for drawing a few conclusions about communications and credibility. First, Western nations appear to be more open and forthcoming in their declaratory strategies. Though they retain varying levels of calculated ambiguity, they readily profess those redlines that require a nuclear response. Second, in generating nuclear credibility, capability is a first principle. Without the threat of a functioning nuclear weapon delivered in retaliation, a country has no capability and therefore no credibility. For credibility, the acquisition of some nuclear capability is the more costly and technical aspect, while it is also the much easier category to communicate. Will of use must be expressed by national leaders, must hold to appreciated redlines, and must be consistent.

### **Characteristics Assessment**

In the table below, the study summarizes the characteristics found for the credibility categories of capabilities and will displayed by the four case-study MDS-adopting nations. The analysis further subdivided each category to highlight the nuances of that nation's deterrence communications credibility. While not all-inclusive, the paragraphs to follow draw attention to some of the commonalities and divergences between the four nations. A snapshot assessment paint the two satisfied arsenal Western nations, the UK and France, as clear in communicating their capabilities and deliberately ambiguous in communicating their will with regard to the use of those capacities. It paints the two restricted arsenal Eastern nations, India and China, as ambiguous or lacking in communicating capabilities while clear in communicating their will to use their nuclear forces.

The first category reviewed examines findings related to the capability and associated subdivisions of nuclear arsenals. Of the five general findings, the first is that the two Western nations communicate with clarity their arsenal sizes and compositions, while the two Eastern nations are lacking in communications regarding their arsenals. The second finding is that of the four nations examined, only France is lacking in open communications on its arsenal's alert status. While the reason is unknown, the author speculates that it may have something to do with France's undefined "sufficiency" of response. An alternative suggestion is that France's arsenal status relates to its massive retaliation policy and not as an issue of sufficiency.

The third finding is a turnabout from the previous. In a rare sharing of details, France is the only nation to profess a fixed yield to its arsenal. The other nations do not openly communicate this level of fidelity about their capabilities.

The fourth finding focuses on timing, specifically when a nation would strike relative to attacks on its homeland. China is the only nation to communicate with clarity, and their message is of retaliation only. By contrast, through implication and interpretation, the assumption is that the UK and France are both first- and second-strike nations. As is becoming a trend, India has no policies or statements from which to draw a conclusion. An analysis of their arsenal projects a possible first-strike force against Pakistan and a secure second-strike force against China.

The final finding is an amalgamation containing the remaining issues of maintenance, infrastructure, and popular support for nuclear weapons. An assessment finds these subdivisions are of lesser importance to their communication of credibility due to limited statements regarding their impacts. Based on limited findings, both the UK and China communicate taking the necessary actions to maintain a minimum arsenal. This is a continuation from one of Chapter 2's findings that nuclear weapons are costly. The other point worth mentioning focuses on an East/West divergence, specifically in the Eastern pursuit of denuclearization. The two Eastern nations actively pursue disarmament actions, while the two Western nations receive moderate or higher support from their population in maintaining their arsenals. The assessment is Eastern nations seek to rid the world of nuclear weapons while Western nations will retain them until existential security threats are alleviated.

The capabilities review showed a contrast between Eastern and Western communications. Western nations' communications tend to be clear. Eastern nations' tend to be ambiguous or limited. Ironically, there appears to be a reversal in the contrast between East and West with regard to the ability to communicate will. With regard to will, the Western nations are deliberately ambiguous on their policy for use whereas the Eastern nations are clear on use, but mixed (China deliberate, India haphazard) in their delivery. A second reversal returns the Western nation to clarity in communicating what adversarial actions will generate a nuclear response (crossing of redlines, typically infringement upon vital interests) whereas the Eastern nations are mixed in communication but share the idea that a response will be conducted following a strike on the homeland.

The next two findings abandon the East/West groups for a majority-rules collection. With regards to what extent a nation will respond to an unacceptable action committed against it, three of the four nations provide communicated criteria, although ambiguous (*e.g.*, unacceptable, limited). The UK is notably absent in communicating response criteria. The author believes there may be some tie to the UK being both a first- and second-strike nation, and as such, requires the nation to perform calculations with regard to strike and response options. The one subdivision of will where all four nations provide communication is through a codification of

nuclear doctrine. Through some form of official documents or statements, each nation provides its adversaries with a general understanding of actions and reactions.

The final set of findings for communicating will combines the constraints on use with the restraints of non-use. Unfortunately, the messages communicated spread across the board. The only commonalities are the Eastern nations being constrained to no-first-use policies and the Eastern nations plus the UK only being willing to use nuclear weapons against other nuclear weapons nations (see caveats).

In summation, general statements about the four MDS nations paint the Western nations as being clear in communicating capabilities while being deliberately ambiguous in communicating will to use their arsenals. As a reversal, the Eastern nations are ambiguous or lacking in communicating capabilities while being clear in communicating will to use their weapons. However, as the chapter introduction mentions, deterrence is a contract between two parties. An effective evaluation of deterrence communication requires dropping generalities and embracing the nuances of each nation entering into the deterrence contract.



**Table 3: MDS Nation Deterrence Credibility Communications Characteristics**

| Characteristics                                                                             | Countries Assessed                              |                                                     |                                           |                                                  |                          |                          |
|---------------------------------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------|-------------------------------------------|--------------------------------------------------|--------------------------|--------------------------|
|                                                                                             | UK                                              | France                                              | India                                     | China                                            | Soviet Union/<br>Russia  | U.S.                     |
| Capability/Capabilities                                                                     | Satisfied Arsenals                              |                                                     | Restrained Arsenals                       |                                                  | Maximum Arsenals         |                          |
| • Clear on size                                                                             | Yes (<200)                                      | Yes (<300)                                          | No                                        | No (minimum)                                     | Yes (New START)          | Yes (New START)          |
| • Clear on composition                                                                      | Yes (monad)                                     | Yes (dyad)                                          | No                                        | No                                               | Yes (New START)          | Yes (New START)          |
| • Clear on alert status                                                                     | Yes (reduced)                                   | No (unclear on what “sufficiency” implies)          | Yes (minimal)                             | Yes                                              | No                       | Yes                      |
| • Selectable Yield                                                                          | Unknown                                         | No                                                  | Unknown                                   | Unknown                                          | Unknown                  | Unknown                  |
| • Strike capability (first-strike, secure-second strike)<br>*NWS = nuclear weapons state(s) | Both - implied from allowed strikes against NWS | Both – implied from refused embrace of no-first-use | Unknown                                   | Secure-second strike                             | Both                     | Both                     |
| • Maintenance actions                                                                       | Adequate for sustainment                        | Unknown                                             | Unknown                                   | Limited development                              | Adequate for sustainment | Adequate for sustainment |
| • Enterprise actions                                                                        | Adequate for sustainment                        | Unknown                                             | Pursues redundancies for survivability    | Limited development for lean and effective force | Adequate for sustainment | Adequate for sustainment |
| • Nuclear weapons value to population (vehemently, moderate, other)                         | Moderate                                        | Vehemently                                          | Other – persistent pursuit of disarmament | Other – persistent pursuit of disarmament        | Vehemently               | Moderate                 |

| <b>Will of Use</b>                                                                                           | <b>UK</b>                                       | <b>France</b>                                                  | <b>India</b>                                                        | <b>China</b>                                                     | <b>Soviet Union/<br/>Russia</b>                             | <b>U.S.</b>                                                 |
|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Statement(s) of use (clear, ambiguous, confused)</li> </ul>           | Ambiguous                                       | Ambiguous                                                      | Clear                                                               | Clear                                                            | Ambiguous                                                   | Ambiguous                                                   |
| <ul style="list-style-type: none"> <li>Condition of statement (deliberate, haphazard)</li> </ul>             | Deliberate                                      | Deliberate                                                     | Haphazard                                                           | Deliberate                                                       | Deliberate                                                  | Deliberate                                                  |
| <ul style="list-style-type: none"> <li>When or why of use</li> </ul>                                         | Redlines – vital interests, including alliances | Redlines – vital interests, extreme conditions of self-defense | Unknown – retaliation for WMD strikes on population or armed forces | Redlines – counterattack in self-defense, defense of Taiwan      | Unknown – vital interests, counterattack in self-defense    | Redlines – vital interests including alliances              |
| <ul style="list-style-type: none"> <li>Type of response (first-strike, retaliatory second strike)</li> </ul> | Both                                            | Unknown                                                        | Retaliatory second strike                                           | Retaliatory second strike; first strike for protection of Taiwan | Both                                                        | Both                                                        |
| <ul style="list-style-type: none"> <li>Degree of response</li> </ul>                                         | Unknown                                         | Unacceptable damage                                            | Unacceptable losses                                                 | Effective limited retaliation                                    | Unknown – able to range from limited to unacceptable damage | Unknown – able to range from limited to unacceptable damage |
| <ul style="list-style-type: none"> <li>Codified doctrine of use</li> </ul>                                   | Yes                                             | Yes                                                            | Yes                                                                 | Yes                                                              | Yes                                                         | Yes                                                         |
| <ul style="list-style-type: none"> <li>Codified popular support</li> </ul>                                   | Unknown                                         | Yes                                                            | Unknown                                                             | Unknown                                                          | Unknown                                                     | Unknown                                                     |

| (continued)                                                             | UK                                         | France                                                                                                                 | India                                           | China                                                                    | Soviet Union/<br>Russia | U.S.                                                  |
|-------------------------------------------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------------|-------------------------|-------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Constraints of use</li> </ul>    | Unknown                                    | No; not limited by nature of threat, identity of state concerns, or means employed; does not subscribe to no-first-use | Subscribes to no-first-use; minimal deployments | Subscribes to no-first-use; no pursuit of arms race                      | Unknown                 | Intends not to use against state-executed CBW attacks |
| <ul style="list-style-type: none"> <li>Restraints of non-use</li> </ul> | No use against non-nuclear NPT signatories | Not for war-fighting; not to be used against non-state actors                                                          | No use against non-nuclear weapons states       | No use against non-nuclear weapons states nor nuclear weapons-free zones | Unknown                 | No use against non-nuclear NPT signatories            |

Source: Author's Original Work

## Conclusion

### Policy Options and Future Considerations for the U.S. Adopting an MDS

*To assert confidently that US nuclear weapons no longer are valuable for deterrence purposes, however, is to claim knowledge about how varied contemporary and future leaders in diverse and often unpredictable circumstances will interpret and respond to the distinction between nuclear and nonnuclear threats.*

– Keith B. Payne  
*On Nuclear Deterrence and Assurance*

The U.S. nuclear arsenal's fundamental purpose is to deter adversaries from attacking the U.S. and its interests from adversary nuclear arsenals, or other forms of weapons of mass destruction (WMDs).<sup>1</sup> Robert Haffa observed that "prudence dictates that the United States maintain and sustain its deterrent capabilities for some time until it can conclude that the nuclear arsenals of Russia and China threaten no more harm to the U.S. mainland than do those of Great Britain and France."<sup>2</sup> In contrast, President Obama called for a world without nuclear weapons.<sup>3</sup> The debate today seeks to determine what arsenal, using what strategy, and by what means of communication the U.S. will convey its threats of compellence – deterrence or coercion – to prevent an attack by WMDs. Unfortunately, the policy debate on these issues lags behind efforts to reduce the U.S. nuclear arsenal to levels that approach those of nations employing minimum deterrence strategies. In fact, the U.S. policymakers are charting a course to back into a minimum deterrence strategy by default, rather than by design. This concern is at the core of this research project.

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<sup>1</sup> Policymakers argue that nuclear weapons remain the only weapons in the U.S. arsenal that can hold at risk the full range of targets valued by an adversary. Some DoD officials find value in their ability to threaten to impose costs and deny benefits to an adversary in an exceedingly rapid and devastating manner. Former senior defense officials add that they provide an ability to prevent defeat in a conventional war and deter conventional war between major powers. Additionally, those same officials add that nuclear weapons guard against blackmail by other nuclear-armed states and help preserve U.S. military capability to project power. Commentators add that the U.S. strategy incorporates several additional objectives in its nuclear deterrent including efforts to deter state-sponsored acts of nuclear terrorism, dissuade other major powers from engaging in arms competition, prevent nuclear proliferation by reassuring allies through extended deterrence commitments, and provide a general 'insurance' against future strategic threats to a range of 'vital interests'.

<sup>2</sup> Robert P. Haffa, Jr., Ravi R. Hichkad, Dana J. Johnson, and Philip W. Pratt, Deterrence and Defense in "The Second Nuclear Age," Analysis Center Papers (Los Angeles, CA: Northrop Grumman Corporation, March 2009), 14-15.

<sup>3</sup> Barack H. Obama, "Remarks in Prague, Czech Republic," Daily Compilation of Presidential Documents 00228 (April 5, 2009): 3, <http://www.gpo.gov/fdsys/pkg/DCPD-200900228/pdf/DCPD-200900228.pdf> (accessed 4 January 2012).

This study examines four nations that embraced variations of a minimum deterrence strategy. Using the debate framework of what arsenal, what strategy, and what communications, the study examines the choices made by the United Kingdom, France, India, and China. As the study results will show, two states limited their nuclear programs because their policymakers were satisfied by the status of their arsenals. The other two states restrained their efforts, resulting in MDS programs. An understanding of how each nation determined arsenal, strategy, and communication of its nuclear will and capabilities provides the insights reflected in the findings, recommendations, and implications that follow in this chapter.

## **Findings**

### **Definitions and Strategies**

For this study, the definition of deterrence has not changed; however, the discussion redefines the arrangement between it, coercion, and compellence. The relationship is better characterized by rearranging compellence as the umbrella term, a term placed over the top of deterrence and coercion due to its definition as a means of pressuring or influencing other nations.<sup>4</sup> Compellence uses the exertion of pressure through the employment of deterrence and coercion.

Deterrence's definition remains as the tacit agreement between two parties for the maintenance of a status quo and a discouragement to act otherwise. With deterrence, there is a communicated threat that if the adversary deviates from the status quo, the deterrer will punish them. Opposite of deterrence is coercion. Coercion is the act of returning the relationship to the status quo when the adversary has deviated; that is, when they have crossed specified redlines. Coercion also qualifies as the act of changing the agreement's conditions to a new status quo, regardless if the adversary deviated from the previous one. In nuclear matters, the nations of the world maintain deterrence's status quo daily. Since no adversary nations have crossed deterrer-specified redlines, the need to use nuclear coercion to reestablish the status quo has not been required.

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<sup>4</sup> Schelling considers deterrence and compellence as partners under the umbrella of coercion, whereas Pape drops the umbrella and juxtaposes deterrence to coercion. The author blended the two, but swapped Schelling's compellence and coercion terms. The umbrella of compellence was chosen based on the definition of compel as "to cause to do or occur by overwhelming pressure." For more, see Merriam-Webster.com Dictionary, s.v. "deterrence," "coercion," "compel," <http://www.merriam-webster.com/> (accessed 1 May 2012).

The conduct of nuclear deterrence requires a nuclear strategy. That strategy springs from policy options that express not only the strategy but also the force or arsenal composition.<sup>5</sup> While there is a continuum of policy options for nations to choose from, this study explored strategies in the region between minimum and maximum deterrence.<sup>6</sup> The study found that Russia (employing the former Soviet Union's arsenal) and the U.S. currently embrace maximum deterrence strategies.<sup>7</sup> The study also found that all other nuclear weapons nations embrace some variation of minimum deterrence strategies, and tend to lean closer to the minimum end of the continuum versus the maximum end.

The study concluded that a true minimum deterrence strategy (MDS) maintains four characteristics. First, a nuclear weapon's primary purpose is to deter attacks against the homeland. Since the weapon has no other purpose outside of its unanticipated use, policymakers therefore hold nuclear weapons as 'instruments of last resort' and thus minimize their emphasis in statecraft. Next, an MDS arsenal is 'used' only in times of failed deterrence, and not for preemptive or preventative coercion. Therefore, the arsenal must remain secure and be designed for second-strike retaliations. Deterrence literature refers to this as a no-first-use policy, although not every country with an MDS declares such a rule.

The third characteristic is that nations structure their MDS arsenals to ensure second-strike capabilities. Due to low arsenal numbers, the default targeting strategy focuses on countervalue targets with only a small reserve for re-strike efforts. Dovetailed to the retaliation-only arsenal is the lack of need for a force to maintain high alert rates. For this final characteristic, only the retaliation force needs to maintain alert rates commensurate with the desired response time determined by policymakers.

The research found that some nations adopted 'minimum plus' deterrent strategies. These nations achieved their 'pluses by variations in capabilities or strategy. Some nuclear states

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<sup>5</sup> Policy options for nuclear deterrence express not only a nation's strategy and arsenal composition, but also the arsenals employment strategies, targeting schemes, and communications of capabilities and will of use.

<sup>6</sup> Nuclear deterrence policy options span a continuum from post-existential deterrence to nuclear primacy. Arranged from 'low-to-high' with respect to arsenal size: post-existential, existential, minimum, maximum, primacy.

<sup>7</sup> A maximum deterrence strategy maintains several characteristics in opposition to a minimum deterrence strategy. For a maximum, a large arsenal is necessary and must be composed of a variety of delivery means, ideally stocked to maintain parity with the adversary. The arsenal must be secure for both second-strike retaliations and first-strike initiations, and must maintain high alert rates. The arsenal's composition must maintain capabilities to target and destroy an enemy's nuclear forces. That is, a maximum deterrence strategy nation must subscribe to counterforce targeting in an effort to blunt the enemy's second-strike retaliation. Additionally, policymakers must emphasize the role nuclear weapons play in statecraft, and most likely will communicate an ambiguous declaratory policy reflecting the nation's nuclear capabilities and will of use.

have larger arsenals than others, but articulate a survival-only strategy for their arsenals. Other nuclear powers with small arsenals extend their deterrent capabilities with strategies, for example, of extended deterrence. In short, the ‘plus’ accounts for nations employing arsenal compositions, employment strategies, targeting schemes, or communications that go beyond the minimum.

The question of why states pursue nuclear weapons capabilities led to another interesting finding, especially when one considers that the two Cold War superpowers extended nuclear deterrence to many protégé nations.<sup>8</sup> The research concluded that nations pursue nuclear weapons for two reasons: security and prestige. Most nations pursue the weapons for security. They see the possession of a nuclear arsenal as a means of maintaining national sovereignty against those who may threaten it, without reliance on a third party that might or might not come to their defense in a survival confrontation. Some nations pursue the weapons for prestige, either on the national or international stages. Great national pride accompanies possessing nuclear weapons, and their acquisition allows entry into a very restricted club. Regardless of the primary reason for acquisition, all nations possessing them reap the benefits from both reasons.<sup>9</sup>

### **Adopting an MDS**

This study examined the four cases, each MDS-adopting nation along with the limited information occasionally provided by the other nuclear weapons nations. The examinations focused on each nation’s pursuit of an MDS, the arsenal pursued because of this strategy selection, and the communications made supporting their strategy choice. While there are similarities among all four, and between subgroups of the four, each nation pursued a different path to its version of an MDS. The study concluded that either the overwhelming cost of the nuclear weapons or the embrace of an ideology of nuclear minimization dictated strategy choice and arsenal size. Regardless of path traveled, the UK, France, India, and China embraced variations of an MDS, and individually tailored their strategies and arsenals to their perceived security requirements.

The study showed that the UK did not adopt an MDS by design; rather, it was by default, owing to the overwhelming cost of nuclear weapons coupled to a perceived reduction in national

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<sup>8</sup> Extended deterrence is a defensive commitment by a nuclear weapons nation to provide nuclear deterrence, and if necessary nuclear coercion, on behalf of an ally or partner (protégé). Extended deterrence has two benefits. The first is that it assures allies and partners and strengthens those relationships. The second is that the protégé has no requirement to possess nuclear weapons. The nonproliferation of nuclear weapons or technology is an opportune by-product of the extended offer. See Kurt M. Campbell, “Nuclear Proliferation beyond Rogues,” *The Washington Quarterly* 26, no. 1 (Winter 2002-03): 15.

<sup>9</sup> Nations initially seeking security do not refute the prestige granted by possessing the weapons. The reverse is true for those nations initially seeking prestige, they do not refute the security gained.

security concerns.<sup>10</sup> Finding the costs of maintaining the arsenal and accompanying nuclear enterprise too great, the UK made drastic cuts to its forces and found itself backing into an MDS by means of default, and not by design.

The study concluded that at present, the UK's arsenal serves to provide security against perceived and unexpected threats (to include nuclear blackmail and nuclear terrorism), along with providing extended deterrence to the other member-nations of NATO as a nuclear capabilities provider. In doing so, the UK clearly communicates its capabilities including the refusal to embrace a no-first-use policy, while obfuscating its will of use through the declaratory policy of calculated ambiguity.<sup>11</sup>

In contrast, the study found that France sought a minimum strategy and accompanying arsenal from the beginning. The French based their strategy on achieving 'sufficiency' against an unspecified adversary while protecting their vital interests. Furthermore, the study found that the employed strategy required a smaller arsenal than one the French could actually afford, but one that is appropriate and based on cost and the lack of a strategic requirement to enter into a great power nuclear arms race. France will continue to maintain its arsenal for both security concerns and to support its regional and global political ambitions.<sup>12</sup> The French arsenal, deemed 'sufficient' by French policymakers, supports a strategy that openly communicates a robust refusal to embrace a no-first-use policy.<sup>13</sup> The study shows that like the UK, France clearly communicates its capabilities, but remains ambiguous on the conditions of arsenal use.

The study found that India's nuclear pursuit stands in contrast to the other three case-study nations. India initially pursued nuclear weapons not for security reasons (following their

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<sup>10</sup> The UK initially sought a near-maximum deterrence strategy and accompanying arsenal. Multiple delivery means and an obligation to support NATO's nuclear planning group through extended deterrence resulted in an arsenal well beyond the minimum necessary for UK sovereign protection. Additionally, whether from uncertainty in America's support through extended deterrence, or to provide the Soviet's with a security dilemma by possessing an independent nuclear decision-making center, the UK developed a strategy and accompanying arsenal that was far beyond its twenty-first century security needs. Post-Cold War drawdowns in the light of lesser existential threats forced the UK to examine its nuclear strategy and arsenal.

<sup>11</sup> The only items of clarity are the UK's willingness to use nuclear weapons when it finds its vital interests at stake (to include its alliance obligations), and its refusal to strike non-nuclear nations that are signatories to the Nuclear Non-Proliferation Treaty (NPT).

<sup>12</sup> Bruno Tertrais, "French Perspectives on Nuclear Weapons and Nuclear Disarmament," *Unblocking the Road to Zero Nuclear Security Series*, no. France and the United Kingdom (February 2009): 1.

<sup>13</sup> French leadership see nuclear retaliation as consistent with the right to self-defense, and that embracing a no-first-use policy would endanger that retaliation potential. While a low-numbers arsenal driven by an appreciation for the tremendous cost of nuclear weapons may appear to be an embrace of an MDS, France's offensively focused employment strategy and expansive countervalue targeting scheme enshrine it as a minimum-plus nation.

1962 defeat by the Chinese), but for national, and later international, prestige.<sup>14</sup> The study concluded that in compliance with a true MDS, India maintains a defensive posture defined by a policy of no-first-use and a non-use against non-nuclear weapons states, maintains a de-alerted and de-mated warhead status, and maintains absolute civilian control over the nuclear force.<sup>15</sup> While India's capabilities communications remain vague and limited, it shows consistent clarity regarding its will of use through statements of inflicting 'unacceptable damage' on its enemies if forced to retaliate with nuclear weapons.<sup>16</sup>

Finally, China gravitated heavily toward the characteristics of a true MDS. Since the October 1964 initial detonation, China has consistently asserted a nuclear doctrine based on a no-first-use concept and an arsenal characterized as a minimum deterrent against nuclear attacks in preservation of sovereignty.<sup>17</sup> Holding close to a true MDS, China's small arsenal maintains a capability only to destroy a few big cities in retaliation.<sup>18</sup> The study found that while Beijing remains nearly mum with communications on China's nuclear capabilities, the Chinese do clearly communicate their will to use nuclear weapons in retaliatory response counterattacks or in the defense of Taiwan.

The study conducted a few special excursions on lesser nuclear weapons states, particularly two that pursued an MDS and arsenal – one by design and one by default. Pakistan holds to its version of an MDS by default. While Pakistan's small arsenal may hold close a true MDS, the study found that the policymakers eschew a no-first-use policy while valuing their rapid dispersion first-strike capable arsenal.<sup>19</sup> In contrast, the suspicion surrounding Israel's nuclear strategy and arsenal, illuminated by Israel's ambiguity on both, lead to the conclusion that there must be an element of design to this strategy. The final MDS-adopting country, South Africa, is the only nation to acquire nuclear weapons and then step back and return to a zero-nuke

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<sup>14</sup> The 1974 peaceful nuclear explosion served as a demonstration of Indian technical capabilities. It took until 1989 for nuclear weapons to be developed (although covertly), and it was not until 1998 that India became a declared nuclear power. India's current arsenal serves to provide security against both nuclear-armed Pakistan and China.

<sup>15</sup> The one contradiction to a true MDS is India's statements about conducting an overwhelming response (sometimes termed "unacceptable losses") when it deems the use of nuclear weapons necessary.

<sup>16</sup> India's sole downfall in communicating its will of use stems from its haphazard announcements that tend to be muddled, incomplete, and inconsistently timed.

<sup>17</sup> China's initial pursuits of a nuclear arsenal stem from a perception that the U.S. was conducting "nuclear blackmail" against them.

<sup>18</sup> Maj Gen Pan Zhenqiang, "China's Nuclear Strategy in a Changing World Strategic Situation," *Unblocking the Road to Zero Nuclear Security Series*, no. China and India (March 2009): 30.

<sup>19</sup> International attention due to Pakistan's history of proliferation, questionable security of its arsenal, and ongoing animosity with India overshadows the fiscal and technical challenges necessary to produce a greater number of warheads.

posture.<sup>20</sup> Much like Israel, South Africa lacked communications on both its capabilities and will until the decision to return to conventional-only capabilities.

While each case-study nation independently arrived at its MDS variation, the study found several commonalities among them. First, the study categorizes the two Western nations (the UK and France) as being satisfied with their arsenals.<sup>21</sup> Lacking restrictions to finances (initially) or technical means, these two nations by design chose to place limits on their arsenals once they deemed them of sufficient size to meet policymakers' needs. In contradiction, the study categorizes the two Eastern nations (India and China) as possessing restrained arsenals. Due to excessive costs or the embrace of an ideology of minimization, these two nations capped their arsenals at the minimum necessary to achieve national objectives. The study found a third category, the embattled arsenal, and attributed it to Pakistan. Pakistan's struggle for both external security and internal survivability place its arsenal in the crosshairs of instability. While this category is highly unlikely for a future U.S. arsenal reduction, the arrival at a satisfied arsenal by design is preferred over a restrained arsenal by default, indicating at the very least some amount of forethought versus the serendipity of default.

Another comparison found in the study followed along East-West geographic lines examining communications on nuclear capabilities and will of use. The study concluded that Western nations exhibited clarity in communicating the capabilities of their respective arsenals. In contrast, Eastern nations were vague or absent in their communications. In comparison, Western nations were ambiguous on the matter of will of use, whereas Eastern nations were clear on the issue of purpose. While an definitive determination as to why this occurs was not determined, the author suspects that the Eastern nations' favor of nuclear abolition leads to the deterministic communications of first, a distaste for possessing nuclear weapons, and second, if they must exist, then they will be used for very definitive purposes and in very specific situations.

### **Recommendations**

For a study exploring nuclear deterrence, and specifically concerned with nuclear arsenal reductions, the natural recommendation is a suggestion regarding the next step in U.S. arms reductions. That target audience is not only policymakers, but also those charged in the various

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<sup>20</sup> It did so under improving conditions of national security.

<sup>21</sup> Malcolm Chalmers, "Introduction and Overview," Small Nuclear Forces: Five Perspectives, Royal United Services Institute for Defence and Security Studies (RUSI) Report (London: Whitehall Reports, December 2011), 4-7. There is a fourth yet unrecognized category, the nuclear aspirant. Having a desire for nuclear weapons capability yet lagging behind the embattled arsenals in terms of progress towards that goal defines this actor. Iran, Syria, and Saudi Arabia in response to an Iranian weapon and perceiving limited support from the U.S. provide good examples of nuclear aspirants. Haffa et al., Deterrence and Defense, 10.

Departments (Defense, Energy, and State) for formulating and then executing nuclear arms reduction negotiations and strategy. Therefore, the author recommends making the next stop in pursuing a world free of nuclear weapons at the level of 1,000 strategic weapons.

A reduction to 1,000 strategic weapons would maintain security against known and unexpected threats to the U.S. An arsenal this size remains double the size of other nuclear nations, except Russia, maintaining a numerical hedge against the other nuclear arsenal states. Significantly smaller numbers (*e.g.*, 500 or less) place U.S. security and prestige interests on par with additional nuclear nations and imperil U.S. nuclear security by making it possible for a combination of nuclear competitors to ally against it. In addition, very low numbers place extended deterrence options and commitments at risk as allies would rightly question U.S. commitment to their security, when its safekeeping has no cushion beyond survival requirements. Further, such a breakdown in extended deterrence could lead to nuclear proliferation as former protégés decide to look to their survival through the building of nuclear arsenals of their own. Finally, if the concerns over a reduced U.S. security are not concern enough, then pursuing an arsenal reduced to the number 1,000 has a certain ‘roundness’ that appeals to other commentators and analysts.<sup>22</sup> As several strategists observed, “[E]ven absent a detailed accounting of nuclear requirements indicating whether the United States needs tens or hundreds of nuclear weapons for deterrence, [a] quick assessment can provide confidence that the number will not exceed one thousand.”<sup>23</sup>

If policymakers chose to ignore this recommendation, the U.S. will likely depart on a path to ‘back into’ an MDS by default, rather than by design. While a couple hundred warheads *might* ensure an effective minimum deterrence, a thousand warheads are *more likely* to guarantee the effectiveness for both minimum deterrence (U.S. sovereignty) and extended deterrence (offered to allies and partners). With numbers at a 1,000 vs. in the low 100s, U.S. policymakers would retain policy options concerning future nuclear deterrence strategies and their implementation.

### Implications

The first implication projected beyond this study is that the deterrence concept does not change with smaller arsenals; however, strategy does. Deterrence tends to be relatively insensitive to changes in the size, configuration, and readiness of a nuclear force. The reason is

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<sup>22</sup> Stephen J. Cimbala, “Nuclear Arms Reductions, Abolition and Nonproliferation: What’s Ideal, What’s Possible, What’s Problematical?,” *Journal of Slavic Military Studies*, no. 22 (2009): 344.

<sup>23</sup> Hans M. Kristensen et al., Robert S. Norris, and Ivan Oelrich, *From Counterforce to Minimal Deterrence: A New Nuclear Policy on the Path Toward Eliminating Nuclear Weapons*, Occasional Paper No. 7 (Washington, DC: Federation of American Scientists/The Natural Resources Defense Council, 2009), 3.

that deterrence is a contract that relies on a threat of action should the status quo be interrupted by the adversary. As long as the threat exists, and remains credible, deterrence with 100 weapons or 10,000 weapons makes no difference.

What policymakers must categorically understand is that an arsenal reduction affects available policy options. In the case of a designed U.S. adoption of an MDS, with U.S. security guaranteed, the most strident policy option forfeited is the ability to provide extended deterrence to allies and partners. Beyond that, U.S. drawdown decisions will truncate or forfeit available policy options for the employment of U.S. nuclear capabilities. Those impacts include the loss of a first-strike strategy, reducing the U.S. to a retaliation-only second-strike nation. Additionally, arsenal reductions will affect targeting scheme options, reducing the myriad counterforce and countervalue variations available today to potentially a true countervalue-only/counter-city targeting scheme. Finally, the reduction or loss of nuclear employment capabilities will significantly reduce policy options regarding strategic communications. When a nation's arsenal is of a certain composition, communicating ambiguity about its capabilities and will to employ becomes a poor bluff. The warnings above highlight the point that nuclear policy options retained today are likely to become nuclear policy default positions tomorrow if the U.S. unwittingly backs into an MDS.

The next implication projects a concern for security veiled as a concern for prestige. A U.S. arsenal reduction to some point near yet fewer than 1,000 strategic weapons will require policymakers to reevaluate existential adversaries. While all examined MDS-adopting nations hold arsenals below 500 strategic weapons, a U.S. approach to parity at the low end of arsenals results in a condition where nations seeking to challenge the U.S. as a nuclear power require considerably less arsenal growth to increase from 300 to 500 weapons, than from 300 to 1,000 weapons. If this hypothetical occurs and the U.S. is no longer a nuclear superpower, then its security becomes threatened by nations previously thought to be 'lesser' nuclear powers.

Finally, and a corollary to the previous point, a proposed U.S. strategic nuclear arsenal drawdown accompanying the adoption of an MDS is likely to provide U.S. nuclear parity with the other nuclear weapons nations. Tom Sauer offers a troubling analysis that forecasts, dating back to 1945, the emergence of a new nuclear weapons state approximately every six to seven years.<sup>24</sup> Before considering the next U.S. strategic nuclear arsenal reduction, policymakers must embrace the following two ideas. The first, that nations acquiring nuclear weapons in the near

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<sup>24</sup> Tom Sauer, "A Second Nuclear Revolution: From Nuclear Primacy to Post-Existential Deterrence," *The Journal of Strategic Studies* 32, no. 5 (October 2009): 753.

future are likely to have small arsenals.<sup>25</sup> The second, that as nuclear arsenal numbers decrease, the risk to stable deterrence increases or discrepancies in the numbers of weapons held by different countries really start to matter.<sup>26</sup> The reduction in force levels is leading to situations where the number of weapons maintained by a nation might begin to make significant impacts on core deterrent missions. Additionally, the chance of a nuclear war involving an exchange of only a handful of nuclear weapons becomes significant and continually increasing.<sup>27</sup> For policymakers and pundits alike, a policy-driven drastic reduction in the U.S. nuclear arsenal will spur the reduction in deterrence and coercion options.

### Future Research

**Nuclear Zero.** During both the research and writing of this study, several interesting yet tangential topics were uncovered. The first is arguably the most pertinent to this study. There is a need to define succinctly and agreeably a meaning for nuclear weapons zero. Some take it to mean no deployed weapons; others no stockpiled or assembled weapons.<sup>28</sup> Some view the agency in control (civilian versus military) making a distinction, others that an international body could control them but none at a national level. While this idea seems simple on the surface, its complexity lies in the deeper issues of hair-trigger mobilization and rebuilding plans or affording great power status based on economic and conventional military superiority.<sup>29</sup> Defining zero the number is easy, understanding and describing the geopolitical stage when embraced unilaterally is the challenge.

**Deterrence Destabilizing Actions.** According to Tom Sauer, there are five current trends undermining the potentially stabilizing effect of nuclear deterrence: horizontal proliferation, the nuclear taboo, international law, the risk of nuclear terrorism, and missile defense.<sup>30</sup> Each one of these topics has and will continue to receive research and reviews in appropriate academic journals. The author suggests adding a singular focused topic, an evaluation of deterrence against 'rogue' states.<sup>31</sup> Paired with this topic is the idea that if

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<sup>25</sup> Ward Wilson, "The Winning Weapon? Rethinking Nuclear Weapons in Light of Hiroshima," *International Security* 31, no. 4 (Spring 2007): 178-179.

<sup>26</sup> Lawrence Freedman, "British Perspectives on Nuclear Weapons and Nuclear Disarmament," *Unblocking the Road to Zero Nuclear Security Series*, no. France and the United Kingdom (February 2009): 56.

<sup>27</sup> Wilson, "The Winning Weapon?," 179. "Critics of minimum deterrence also argue that it could promote proliferation among America's allies. The more states with nuclear weapons, the more chance that they will be used." Matthew Rendall, "Nuclear Weapons and Intergenerational Exploitation," *Security Studies* 16, no. 34 (October-December 2007): 549.

<sup>28</sup> Sverre Lodgaard, "Toward a Nuclear-Weapons-Free World," *Daedalus* 138, no. 4 (Fall 2009): 142.

<sup>29</sup> Group Capt Tim D. Q. Below, "US Nuclear Deterrence: An Opportunity for President Obama to Lead by Example," *Air and Space Power Journal* XXII, no. 4 (Winter 2009): 93.

<sup>30</sup> Sauer, "Second Nuclear Revolution," 752.

<sup>31</sup> Haffa et al., *Deterrence and Defense*, 17.

deterrence fails or is determined to be unachievable, where does preventive military action against these states fall relative to deterrence and coercion. As part of this research, an additional suggestion is to explore the definition of ‘rogue state.’ If a nonnuclear nation pursues nuclear weapons, would the current nuclear weapons states or the international community consider them as rogue? Not only would rogue need redefining, but also the research would include examining Kurt Campbell’s list of ten specific reasons that could lead nonnuclear nations to reconsider nonproliferation.<sup>32</sup>

**Nuclear Warfighting.** Chapter 4 alluded to nuclear weapons nations possessing the potential to conduct limited nuclear warfighting. Debate during the era of mutually assured destruction revolved around the possibility of one side being able to control a nuclear conflict to the extent of not suffering an unacceptable level of damage while still meeting strategic objectives.<sup>33</sup> If curiosity remains as to the conduct of a limited nuclear war, the author offers two ideas for consideration. The first is determining if there is an incentive to limit the geographical area of their use. That is, if the two superpowers elected to fight, might they refrain from conducting nuclear attacks on their respective territories?<sup>34</sup> The second idea is how to conduct nuclear warfighting with the potential involvement of ballistic missile defense capabilities. Part of the Cold War stability grew from both nuclear superpowers having treaty-driven limits to anti-ballistic missile (ABM) capabilities. With U.S. investment in ABM capabilities designed to protect against rogue or accidental launches, does the balance of terror change when considering limited nuclear warfighting?

### Concluding Thoughts

This study does not offer a formulaic answer to the question of how many nuclear weapons the U.S. arsenal should contain; rather, it looks to reinvigorate the discussion of what it might mean to the U.S. if it opts for a minimum deterrence strategy. That adoption could be either by design, or by default. For three of the case study nations examined (France, India, China), their adoption was by design. For the fourth (the UK), it was initially by default followed by a reexamination of arsenal sustainment costs, resulting in a transition to a by-design strategy.

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<sup>32</sup> Kurt M. Campbell, “Nuclear Proliferation beyond Rogues,” *The Washington Quarterly* 26, no. 1 (Winter 2002-03): 13.

<sup>33</sup> Lawrence Freedman, “The First Two Generations of Nuclear Strategists,” in *Makers of Modern Strategy: from Machiavelli to the Nuclear Age*, ed. Peter Paret, Gordon A. Craig, & Felix Gilbert (Princeton, NJ: Princeton University Press, 1986), 762.

<sup>34</sup> Malcolm Chalmers, “The United Kingdom: A Status Quo Nuclear Power?,” *Small Nuclear Forces: Five Perspectives*, Royal United Services Institute for Defence and Security Studies (RUSI) Report (London: Whitehall Report, December 2011), 18-19.

In his 1983 book titled *The Nuclear Future*, Michael Mandelbaum posited that the nuclear future would be much like the past. The reason that the nuclear future would follow a middle path, he argued, was that the alternatives, disarmament and war, were “either too difficult to achieve or too terrible to risk.”<sup>35</sup> While adopting an MDS lacks disarmament’s advantage of limiting the spread of nuclear weapons, it does suggest a lowering of the risk of war.<sup>36</sup>

There is a near-endless supply of promises that a small U.S. nuclear arsenal will be adequate to deter. The offering of these promises hint that deterrence functions as precise and formulaic.<sup>37</sup> In stark contrast, nuclear deterrence is a subjective concept. Someone wishing to understand deterrence must explore questions about ‘how much is enough’ and how do parties communicate both capabilities and will. Ultimately, that someone must explore the effectiveness of nuclear weapons to maintain deterrence.<sup>38</sup> While some believe that conventional deterrence may be adequate for numerous future occasions, there remains sufficient historical evidence demonstrating how nuclear deterrence has helped to prevent conflict or escalation in the past.<sup>39</sup> The middle path of a by-design U.S. adoption of a tailored MDS may be a sufficient answer to the questions posed above and a guarantor national security for the US, its allies and partners.

For the U.S., actions taken to reduce radically the nuclear arsenal, or even achieve a nuclear-zero condition, however defined, represent positive values and hopes for Americans and the global community. However, policymakers must ensure they review every aspect of such a decision, to include potential consequences of being wrong at zero nukes. This study highlights many, but certainly not all, of the considerations a nation attends to in a decision to adopt a minimum deterrence strategy. Let all who read this text hope that policymakers make such a decision by thoughtful design and not serendipitous default, or worse, by whim reflected in a politically expedient sound bite.

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<sup>35</sup> Haffa et al., *Deterrence and Defense*, 3.

<sup>36</sup> Rendall, “Nuclear Weapons and Intergenerational Exploitation,” 545.

<sup>37</sup> Payne, “Maintaining Flexible and Resilient Capabilities,” 16. The predictable formula of deterrence include factors believing that the stakes involved in future crises are already well-known, and that all future opponents have the necessary perceptions, goals, motivations, values, determinations, culture, governing worldview, and mode of communication and decision making.

<sup>38</sup> Jeffrey G. Lewis, “Minimum Deterrence,” *Bulletin of the Atomic Scientists* 64, no. 3 (July/August 2008): 41.

<sup>39</sup> Payne, “Maintaining Flexible and Resilient Capabilities,” 22.

## Appendix A

### Doty Nuclear Arsenal Reduction Schedule

Doty's exercise begins with the assumption that deterrence would be restricted to a single mission – that is, to deter the use of nuclear weapons, or, if that fails, to be capable of retaliation in kind. It then adds the assumption that damage resulting from forbidden first use or in retaliation would not exceed that of larger past wars. The explosive power used in each of the world wars and the Vietnam war is estimated to be just under 2 MT. Hence, Doty chose 2 MT as the minimum deterrent, although 1 MT might be more appropriate, as damage from nuclear weapons would surely be compressed in time relative to a conventional war. Assuming an initial U.S. (or Russian) arsenal size of 512 MT, Doty conducts a series of 5 year quartering reductions resulting in the achievement of the targeted 2 MT arsenal after four rounds and 20 years.<sup>1</sup>

#### A Schedule for Reductions to a Minimum Deterrent by Russia and the United States

| Step                                                                      | Duration    | Yield in MT | (# of weapons in arsenal)<br>If Weapons Were 15 kT | (# of weapons in arsenal)<br>If Weapons Were 100 kT |
|---------------------------------------------------------------------------|-------------|-------------|----------------------------------------------------|-----------------------------------------------------|
| 0                                                                         | 2010 – 2015 | 512         |                                                    |                                                     |
| Adjustment Reductions Begin (Reductions Between the U.S. and Russia-Only) |             |             |                                                    |                                                     |
| 1                                                                         | 2015 – 2020 | 128         | 8,533                                              | 1,280                                               |
| 2                                                                         | 2020 – 2025 | 32          | 2,133                                              | 320                                                 |
| All Nuclear States Join                                                   |             |             |                                                    |                                                     |
| 3                                                                         | 2025 – 2030 | 8           | 533                                                | 80                                                  |
| 4                                                                         | 2030 – 2035 | 2           | 133                                                | 20                                                  |
| Further Reductions?                                                       |             |             |                                                    |                                                     |
| 5                                                                         | 2035 – 2040 | 0.5         | 33                                                 | 5                                                   |

*Source: Doty, with computations completed by the Author*

<sup>1</sup> Paul Doty, "The Minimum Deterrent and Beyond," *Daedalus* 138, no. 4 (Fall 2009): 135.

## Glossary

Counterforce Strikes: Strikes targeted against an enemy's forces, traditionally their nuclear forces.<sup>1</sup>

Countervalue Strikes: Strikes targeted against what an enemy regime holds dear, traditionally cities or population centers.<sup>2</sup>

Declaratory Strategy: A country's stated plan for using nuclear weapons in the perceived imminence or actuality of a nuclear war."<sup>3</sup>

First Strike: A first strike is not simply the first salvo of the exchange. It is an attack directed against an adversary's means of retaliation. First strikes reduce or remove an adversary's capabilities to retaliate, and thus a successful first strike would be one that either destroyed all of the enemy's nuclear forces on the ground or else intercepted them en route before they could reach their targets. First strikes aim to eliminate all the nuclear weapons of the opponent in one (preemptive) blow.<sup>4</sup>

Negative Security Assurance: A guarantee given by the five Treaty on the Non-Proliferation of Nuclear Weapons (NPT) nuclear-weapon states (China, France, the Soviet Union/Russia, the UK, and the U.S.) not to use or threaten to use nuclear weapons against states that have formally renounced them.<sup>5</sup>

No-First-Use Policy: A pledge on the part of a nuclear weapon state not to be the first to use nuclear weapons in a conflict or crisis. No-first-use guarantees may be made in unilateral statements, bilateral or multilateral agreements, or as part of a treaty creating a nuclear-weapon-free-zone.<sup>6</sup>

Positive Security Assurance: A guarantee given by a nuclear weapon state to a non-nuclear weapon state for assistance if the latter is targeted or threatened with nuclear weapons.<sup>7</sup>

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<sup>1</sup> Tom Sauer, "A Second Nuclear Revolution: From Nuclear Primacy to Post-Existential Deterrence," *The Journal of Strategic Studies* 32, no. 5 (October 2009): 747.

<sup>2</sup> Sauer, "Second Nuclear Revolution," 747.

<sup>3</sup> Dennis M. Drew and Donald M. Snow, *Making Twenty-First-Century Strategy: An Introduction to Modern National Security Processes and Problems* (Maxwell AFB, AL: Air University Press, 2006), 172.

<sup>4</sup> Edward A. Corcoran, "Strategic Nuclear Weapons and Deterrence," (November 29, 2005), <http://www.globalsecurity.org/wmd/library/report/2005/sndeterrence.htm> (accessed 5 April 2012).

<sup>5</sup> Leonard S. Spector and Aubrie Ohlde, "Negative Security Assurances: Revisiting the Nuclear-Weapon-Free Zone Option," April 2005, [http://www.armscontrol.org/act/2005\\_04/Spector\\_Ohlde](http://www.armscontrol.org/act/2005_04/Spector_Ohlde) (accessed 21 February 2012).

<sup>6</sup> Nuclear Threat Initiative, "Country Profiles / India."

<sup>7</sup> Nuclear Threat Initiative, "Country Profiles / China / Nuclear," (last updated: December, 2011), <http://www.nti.org/country-profiles/china/nuclear/> (accessed 17 February 2012).

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