The Role of US Nuclear Weapons in the 21st Century

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
00 APR 2002	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
The Role of US Nuclear Weapons in the 21st Century	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Air University Maxwell Air Force Base, Alabama**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES
The original document contains color images.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**UU**	**78**	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std Z39-18

Disclaimer

The views expressed in this academic research paper are those of the author(s) and do not reflect the official policy or position of the US government or the Department of Defense. In accordance with Air Force Instruction 51-303, it is not copyrighted, but is the property of the United States government.

Table of Contents

Abstract

For over 50 years, US nuclear deterrence strategy protected the United States against Soviet expansionism and dominance. US nuclear weapons provided parity between overwhelming numbers of conventional Soviet forces and far fewer US and NATO forces. Far from being constant, however, US nuclear deterrence policy shifted during those years in response to geostrategic circumstances. The strategies of massive retaliation, flexible response, and mutually assured destruction each accomplished a similar mission – provide a deterrent against massive Soviet attack against the West. Nuclear deterrence was arguable at work during the de-escalation of the Korean War, the Berlin Crisis, and the Gulf War. For the last 50 years, US strategic planners found the most dangerous threat and the most likely threat to the US emanated from the same source – the Soviet Union. Planning was relatively straightforward. Today, US strategic planners are faced with a more uncertain world as the most dangerous threat to US survival remains a heavily armed Russia but asymmetric attacks from non-state actors using WMD has supplanted communist expansionism. US strategic deterrence must face both scenarios, now emanating from entirely different sources.

The relevance of US nuclear weapons remains sure. No other weapon provides the massive retaliatory capability in short order or the ability to attack large area targets without risk to US personnel. No other weapon provides the ability to attack deeply buried command and control facilities or to sanitize underground chemical or biological weapon facilities, minimizing collateral damage. The question is not whether nuclear weapons are relevant to the future strategic concerns of the US but how deterrence policy will again shift in response to new geostrategic circumstances. As nuclear weapons are moved from being the US strategic deterrent in and of themselves, these weapons must be placed as important elements of a broader strategic deterrence capability that includes defenses, infrastructure, and conventional weapons. To construct a new deterrent US planners must first overcome several inhibitors associated with nuclear deterrence including treaty obligations, recent trends in defining US adversaries, US capabilities, including revitalization of the nuclear weapons complex; and US credibility. This paper makes a number of succinct recommendations that if followed, will help establish a revised deterrence strategy that overcomes the many obstacles facing the current nuclear deterrence strategy while providing deterrence against the new realities of the New World Disorder. When the full weight of the American people, government, and military are applied against US adversaries, the US ideals of truth and freedom will prevail. There is role for nuclear weapons in the 21st Century but US leaders must seize the present opportunity to mold US dominance into deterrence rather than be forced into force employment.

Chapter I

Introduction

Since the dissolution of the Soviet Union and new security arrangements in Eastern Europe, many in this country and across the globe are renewing cries for nuclear disarmament. They raise the argument that with the outbreak of peace across Europe and the democratization of the Former Soviet Union, the world is a safer place, ready for the eradication of the scourge of nuclear weapons. Though perhaps desirable under certain conditions, such is not likely. This paper will show that today, more than ever, the maintenance of a national nuclear deterrent should remain a cornerstone of US national defense policy into the foreseeable future. The relevance of nuclear weapons to US national defense will be shaped by the recognition of an entirely new geopolitical environment, a national determination to overcome inhibitions regarding the use of nuclear weapons should such become necessary, and a renewed commitment to build the deterrent to meet tomorrow's requirements and not those of yesterday. After presenting some important lessons learned from the Cold War, there follows an analysis of the future strategic environment, recognition of inhibitors to maintaining a nuclear deterrent, conclusions to chart a path forward, and finally, a succinct set of recommendations that will provide a credible nuclear deterrent. Though outside the scope of this paper, the reader can review the history of the Cold War in many widely available works.[1] Some lessons learned from this important period of nuclear diplomacy are presented to help focus the formulation of a nuclear weapon policy for the 21st Century.

Lessons Learned #1 – Engage potential adversaries

Lesson one from the start of the Cold War regards distrust of the intentions of others. The US and Soviet distrust that began immediately after WWII implies that both states failed to decipher the true intentions of the other. The US should have realized that the Soviet Union was earnest in it's desire to build buffer states around its borders to prevent another surprise from the next Hitler that emerged in Europe. The Soviets were justifiably paranoid as they nearly lost their country to German advances in early 1941. Additionally, the US and the Soviet Union failed to engage cooperatively with each other. Rather than seek economic and diplomatic ties with each other, both nations believed the worst of each other and lost an opportunity to engage early in the rebuilding process.

For today, US diplomats must adopt a more sophisticated view of those nations that appear as adversaries. US leaders must attempt to see the world from the perspective of potential adversaries and understand their actions and words in light of their point of view. Such effort requires personnel trained in the cultures and languages of these nations and has already been identified as a weakness in US policy. The September 11, 2001 terrorist attacks on the US brought to the fore the lack of personnel devoted to human intelligence.

Lessons Learned #2 – Provide Flexibility to the Commander in Chief

During the Cold War period, US policy shifted from the doctrine of Massive Retaliation to Flexible Response under the Kennedy administration. Clearly, President Kennedy was not satisfied that during the Cuban Missile Crisis, his options were very limited. In fact he chose a combination of conventional military operations (naval blockade and planned conventional air strikes against Cuba) to stem the rising tensions between the superpowers. The thought of an all

out nuclear exchange with the Soviet Union or no military response was not sufficient to satisfy the national security requirements of the country and Kennedy called for change.

Today, US deterrence strategy should also be rethought in terms of options for the President. The current US arsenal has very little flexibility to deal with military needs short of all out nuclear war. In fact, the Intermediate Nuclear Forces (INF) treaty did away with most of the US tactical warheads that might have some application short of all out nuclear war. The current stockpile of tactical nuclear weapons consists of gravity bombs of significant yield that do not provide the flexibility a President may need to handle regional crises that this paper will examine.

Lessons Learned #3 – Increased Flexibility May Lead to Nuclear Use

The final lesson that this author will draw from the Cold War regards the US policy of Mutually Assured Destruction (MAD) that spanned the latter part of the Cold War. MAD provided stability. The assurance that both the US and Russia would be totally devastated made nuclear weapons "obsolete" or unusable. And in this case a tie game was fine with both countries. An interesting argument in favor of MAD suggests that as we provide flexibility and more usable nuclear warheads for use by the President, the likelihood of use increases. Flexibility and usability may promote the application of nuclear weapons for the first time since 1945. Therefore, when formulating a new deterrence strategy, policy makers must balance the flexibility and usability of our warheads against the increased risk that the United States may again be the sole nation to use these weapons in hostility.

The three lessons-learned cited above, must be considered as policymakers formulate nuclear weapon policy relevant to the 21st century. Coupled with an understanding of the new strategic environment that the US will likely face and the reality of many inhibitors to a new deterrence

strategy, US leaders will be equipped to formulate a truly relevant deterrence policy that is both capable and credible to protect US strategic interests around the world.

Chapter II

Future Strategic Environment

Before a credible nuclear strategy can be devised, one must understand the environment in which that strategy will be applied. In developing military courses of action, it is sometimes helpful to consider two important planning scenarios: the most dangerous enemy course of action; and the most likely enemy course of action. These two scenarios provide a good framework upon which to build a credible plan of action. One must plan for the most likely scenario, while maintaining the capability to react to the most dangerous scenario. In the case of nuclear war strategy, the Cold War presented a rather simple argument upon which US military doctrine was built. In the case of nuclear war planning, the most dangerous scenario (annihilation of the United States population and way of life) was well aligned with the most likely course of action (war with the Soviet Union and communism). Although US nuclear policy shifted over the last 55 years to some degree, the enemy was consistently identified as the Soviet Union. Furthermore, this enemy was to be confronted at every opportunity to stop the spread of world communism.

Today, the most dangerous threat to the United States remains the annihilation of its population and way of life, as the Russian state still maintains over 20,000 strategic and tactical nuclear weapons. Additionally, Russia maintains the ability to conduct a first strike attack on the United States as well as follow-on strikes as opportunities present themselves. Certainly the United States has the ability to retaliate and destroy Russia, but the damage to the United States

could not be undone – thus the current strategy of Mutually Assured Destruction. In contrast to the Cold War, however, one can argue that the most likely threat is no longer a war with Russia or even a war over Russian-sponsored communism. Rather, the United States is working again with Russia as an ally in the fight against world terrorism and is increasingly assisting Russia on the economic front. The US threat most likely to be encountered is now much more difficult to align with traditional all-out nuclear war. The probable encounters against terrorism, rogue states, and regional hegemonic states are among the many choices that a US national deterrence strategy must consider. With the scenarios of most dangerous and most likely courses of action no longer aligned, the United States may find itself having to continue to maintain strategic forces against a possible resurgent Russia while also committing significant resources to the more likely threats mentioned above. Holding two very divergent military postures simultaneously will not be inconsequential to the national purse, but may in fact be the only way of deterring aggression and maintaining US domestic peace in the 21st Century.

Global Trends Will Shape Deterrence

- US sole superpower status
- High-technology proliferation
- Near instantaneous communications around the globe

These are three global trends that will impact the formulation of US nuclear deterrence strategy and policy. This chapter will first review some of the possible future trends that the United States may confront and the specific ramifications of these futures on existing nuclear powers, emerging nuclear powers (rational and rogue), and non-state actors. This work will use some of the excellent works already done on alternate futures and apply the results to the arena of nuclear deterrence.

There are a number of good works in print on the subject of trying to determine the future context within which the US will have to operate.[2] Not surprisingly, none of these works are in precise agreement on what the future will look like, but there are common threads that appear in all of them. One can distill three primary trends that will likely dominate the world for the next 25 years or more: US economic/military dominance, the spread of high technology, and near-instantaneous global communications.

US sole superpower status is expected to remain firmly in place for at least the next 25 years. Russia will continue to work on stabilizing democratic reforms and a free market system while staying politically involved in regional issues in Europe and Asia. Russia will remain an important power as it draws down its nuclear arsenal. China is expected to remain inward looking as it protects its sovereignty and improves its internal economic system. China's autocratic political system will be an important place for US policymakers to engage in diplomacy. Finally, as the sole superpower, the United States will strengthen some friendships and alliances while further alienating certain regional powers across the globe. Asymmetric warfare against the United States will be the norm as smaller powers – both state and non-state – attempt to deter the US from interfering in regional conflicts. Asymmetric tactics will include attacks against US computer systems and will partially help drive the proliferation of weapons of mass destruction.

Second, the proliferation of high technology will continue as globalism creates a compressed world. Geographic dispersal will no longer be an obstacle to commerce, military action, or access to information. Furthermore, high-technology applications will skyrocket from information and communications into new areas such as biotechnology and control systems of practically every facet of human life through the use of microscopic nanotechnologies. The United States will have to purposely choose to stay at the forefront of technological innovation and change to maintain its

dominance. Although many once-low-technology countries will have access to information and knowledge comparable to the US, they will likely remain incapable of fully realizing the benefits of that information. For instance, knowing how to make an atomic bomb is a far different task than building an atomic bomb.

Third, global commerce and information will make communications around the globe nearly instantaneous. Widely different cultures and ideologies will be much more aware of the strengths, weaknesses, likes, and dislikes of their adversaries and allies.[3] These capabilities are ripe for asymmetric attacks in the areas of finance, communications, and trade. Nations that have limited military capabilities can garner the use of satellites, communication platforms, and other space-based assets to bolster their capabilities against the US. These aspects of globalism will also make way for the rise of non-state actors. In fact, one can expect a new sense of vulnerability that flows from the permeability of national borders.[4] It is likely that future adversaries, state and non-state, will use asymmetric techniques to attempt to deter US intervention in regional conflicts, intimidate US allies, and limit US aims when it becomes embroiled in a regional conflict.[5] Although globalism has its positive and stabilizing affects on states, it also carries significant liabilities. The United States will have to clearly safeguard its global systems as a matter of national security.

Lastly, the next 25 years will continue to see a period of great political fluidity. Fledgling democracies will stabilize and solidify their young republics while rogue states struggle to remain stable under the weight of internal rifts as well as external threats from regional powers and the United States. Recognized as a favorable trend, the "collapse of the communist ideology and abandonment of communist authoritarianism by most states of the former Soviet Empire" is inspiring, however, these struggling states are ripe for unrest and undemocratic regimes to seize power.[6] Additionally, focus of US policy will likely shift from a European centric focus to one of

increased diplomacy in Asia. In his testimony before the Senate Committee on the Budget, Dr. Andrew F. Krepinevich, Executive Director of the Center for Strategic and Budgetary Assessments said, "Another trend concerns the rise of great regional powers in East Asia. This, combined with the dissolution of the Soviet empire and the promise of an increasingly integrated European Union (EU), makes it likely that Asia will displace Europe as the focal pint of greatest economic (and military) potential and of US security concerns."[7] In many parts of the world, the bipolar backdrop of the Cold War will be replaced by more regional tensions. In particular, Asia will see regional conflict between Taiwan and Mainland China. The subcontinent will see tension between India and Pakistan. The Middle East will see tensions between Israelis and Palestinians and tensions in the Gulf involving Iran, Iraq, and Saudi Arabia. Finally, Europe will continue to struggle with the strength of the European Union and NATO versus the regional conflicts in the Balkans or in the once dominated eastern bloc countries.

The United States must deal with the trends cited above and the dangerous and uncertain future they portend. This paper suggests that the US response must be a proactive response that couples defensive measures and offensive action to safeguard its interests around the world. Particularly disturbing are the threats that emerge from these global trends including attacks using global information systems and the proliferation of WMD. The threat to US information systems is under significant analysis and study by various governmental institutions and is beyond the scope of this paper. Furthermore, the threats from WMD are also well known, but strategies to deter or respond to these threats through the US nuclear deterrence strategy do not appear in any national military strategy in any level of detail. This paper hopes to raise this issue to the forefront so that rational and workable solutions can be developed using the US nuclear arsenal as the correct tool for the task. This paper now turns to review how the United States should use its

leadership position to deal with the Permanent Five (P5) powers of the United Nations (those powers acknowledging the possession of nuclear weapons), other state actors that may acquire WMD in the near future, and non-state actors that may likewise attempt to acquire WMD.

Adversaries – Large and Small

As stated above, most works on the likely future geopolitical situation include a monopolar world with US superpower status unchallenged. Under these conditions, what should the relationship between the United States and the P5 be? The table below shows the relative nuclear weapon stockpile sizes of the P5.[8] These figures include operational, retired, and reserve warheads. Additionally, the US and Russian stockpiles contain no more than 6000 deployed

YEAR	U.S.	Russia	U.K.	France	China
2000	10,500	20,000	185	450	400

warheads as both countries recently met the START I treaty obligations that required no more than 1600 deployed nuclear delivery vehicles and 6000 accountable warheads.[9] The reader will note that the US and Russian nuclear arsenals are significantly higher than the actual number of deployed warheads. This difference can be reconciled by adding additional nuclear warheads for maintenance spares, destructive and non-destructive surveillance programs, as well as warheads placed in inactive status to hedge against reliability concerns that may arise in a part of the deployed nuclear force. The bottom line is that as long as US and Russian negotiations revolve around deployed nuclear warheads, the arsenals of both countries will remain much higher than the agreed upon limits. As further arms control negotiations consider overall stockpile sizes in addition to deployed systems, one can expect the stockpile sizes to be reduced commensurate with these negotiations.

With US/Soviet stockpiles considerably larger than any peer competitor, the bipolar world made sense. As START negotiations continue, however, there is a point at which the stockpiles of the other three nuclear powers become considerations in further negotiated warhead reductions. In fact, recent meetings between President George W. Bush and Russian President Vladmir Putin have indicated that the two countries will likely reduce deployed delivery vehicles and warheads to between 1700 and 2200 accountable warheads. Working against the downward trend however, is the continued weakening of the Russian conventional forces and increased reliance on nuclear weapons as force equalizers.[10] Most encouraging are statements from Secretary of State Colin Powell, "that the United States expected to meet Russian's demand for a "legally binding" agreement on reducing nuclear warhead, whether that takes the form of a treaty approved by Congress or some less formal document…"[11] In contrast to the earlier START I and START II treaties that include limits on deployed nuclear warheads, without limits on stockpiles warheads, *The New York Times* reported that the Russians desire "that Washington destroy any excess warheads and not simply store them as the Bush administration has proposed."[12] Should arms control talks continue to call for stockpile reductions as well as deployed warhead limitations, nuclear arms control arrangements will become increasingly dramatic in terms of real changes to the geo-strategic landscape. Furthermore, military planners maintain that the negotiations remain strictly between the US and Russians until the two countries near the 1000 warhead mark. At that point, the remaining members of the P5 must be included to fully appreciate the strategic implications of further warhead reductions.

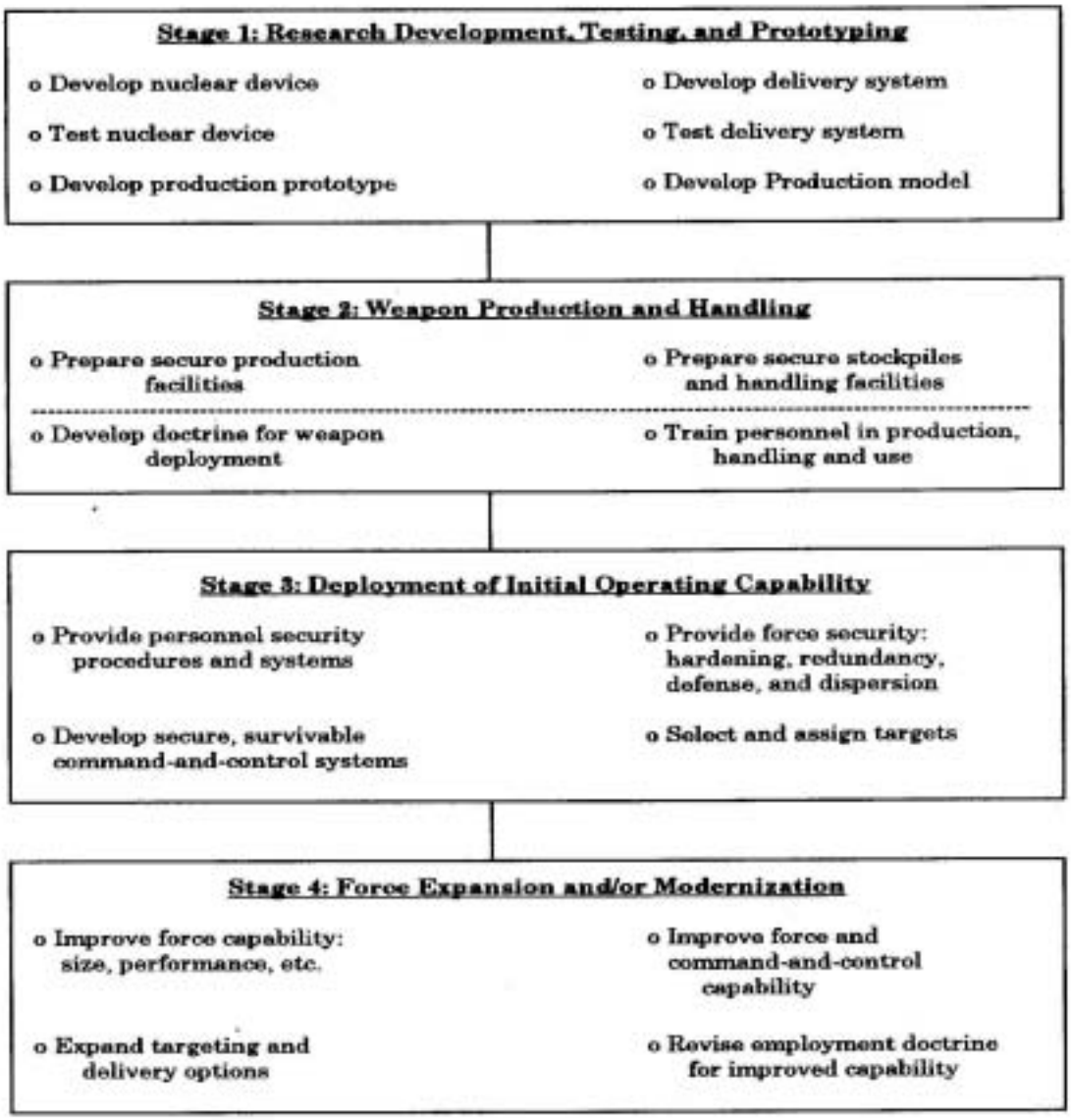
For the next 10 years, the nuclear warhead reductions will take place between the United States and Russia apart from the other P5 country actions. Thereafter, France, Britain, and China must be included in any further talks of stockpile reductions. Regarding China, *Aviation Week*

and Space Technology recently published an article that cites the Commission on America's National Interests.[13] The commission notes that China has continued to modernize its strategic forces including mobile solid-fuel ballistic missiles but says that these efforts are consistent with China's existing policy of minimal deterrence. China's current ICBM, the CSS-4, is capable of striking continental US targets[14], but the commission saw concern not in China's modernization programs but in the strained political atmosphere in the region with Taiwan. One would argue then that although the United States need not focus strategic nuclear planning against China, it must engage her economically and diplomatically to keep regional tensions in check while shaping China's future as a friend of the United States.

Concerning Britain's nuclear arsenal, the United States continues to work closely with Britain as a strategic ally. The two countries have significant cooperative programs involving nuclear weapons that reflect the longstanding and continuing relationship they enjoy. In the foreseeable future, Britain will remain a close ally and friend to the United States.

Outside the P5, it is instructive to understand the reasons that countries and non-state actors would try to obtain nuclear weapons as well as other weapons of mass destruction. Building and maintaining a nuclear arsenal is quite an expensive undertaking. William Kincade, in his occasional paper on nuclear proliferation, identified a group of potential proliferators of nuclear weapons that included India, Pakistan, Iran, Iraq, Libya, and North Korea. Israel is believed to also have nuclear weapons despite its silence on the issue. Kincade reminds the reader that there is a vast difference between having some knowledge of building or acquiring a nuclear weapon and the resources to actually field a credible threat. In the chart below taken from his paper, Kincade annotates the dividing line between adversaries that have some knowledge of nuclear warhead design versus the capability to field a credible threat.[15]

MAJOR STAGES IN NUCLEAR FORCE DEVELOPMENT AND DEPLOYMENT



A state or non-state actor that seeks to develop a nuclear weapon force must be prepared to spend significant amounts of money to build a reliable weapon and then prepare it for use in a delivery system. Considering that none of the proliferating nations listed earlier is particularly flush with cash to spend on the military, one can ask whether their leaders are indeed rational actors – a key element of nuclear deterrence theory.

Consistent with deterrence theory, rational is defined as describing an action that is consistent with the actor's values, whatever these may be.[16] The term rational does not mean moral, nor is it opposite of crazy or reckless. The term implies that the actor considers the costs and benefits of his actions and operates within his value system to compare those costs and benefits. As Wilkening and Watman note, regional powers "are willing to take substantial risks because they frequently enter crises out of a desire to avert some loss, e.g. a loss of territory, power relative to external threats, or the regime's hold on domestic political power."[17] The authors also note the regional opponents resolve since these crises typically involve significant core interests. Lastly, the regional powers may calculate that their ability to inflict significant costs on the United States will outweigh any US interests in their area. In his senate testimony, Dr. Krepinevich went on to testify that "US power-projection operations will become more difficult to execute as even second-rank military powers develop and deploy anti-access/area-denial capabilities, putting fixed, forward bases (and perhaps maritime forces in the littoral) at high risk for destruction."[18]

Leaders of proliferating nations then, choose to develop nuclear weapons for several reasons. Second-tier powers, in an attempt to protect themselves against larger powers, rely upon nuclear weapons as the great equalizer for the weak to deter the strong. According to Avery Goldstein, "as long as they believed that superpowers valued possible gains less than they feared potential losses, second-tier powers need to field only a minimum deterrent force."[19] Although Goldstein's discussion speaks particularly to second-tier states during the Cold War (Britain, France, and China), one can apply these lessons to lesser rate powers today in the more likely regional power setting. No longer do second-tier states fear superpower capabilities, but a similar mindset can be found in smaller regional powers concerned about nuclear capable regional hegemons.

And finally, state and non-state actors may seek nuclear weapons and other WMD for the sake of national prestige. Most recently, India and Pakistan both detonated nuclear devices and signaled that they were regional powers that the United States and other world leaders needed to take seriously. There is increasing pressure from these nations to play a larger part, for instance, in the United Nations, no longer sitting by as the P5 maintain permanent seats on the Security Council. Pakistan and especially India are indeed regional powers that must be carefully consulted before conducting security operations in South Asia. As the United States observed in the recent attacks against the Taliban regime in Afghanistan, the nuclear weapons of these regional powers give pause to even the United States before moving military forces into their respective sovereign lands or the region.

Weapons of Mass Destruction Proliferation

Turning attention now to the specific threats posed by smaller state and non-state actors that are possible proliferators, it is necessary to examine the status of their WMD programs, delivery vehicle capabilities, along with their future prospects and probable targets that the US may consider for preemptive attack.

In the Middle East, the US has known of Israel's possession of nuclear weapons since 1967 after its first nuclear test, but Israel remains silent of the status of its forces till this day. Israel's possession of nuclear weapons has thus far been restrained as neither the 1973 war, the Gulf War, or terrorism has led to use. Regarding threats to Israel's survival Stuart Cohen writes,

> "Thanks to the peace process, the conventional ground and air forces of Israel's immediate neighbors present a less immediate thereat to the country than do two the categories of enemy-sub-conventional forces and weapons of mass destruction. The former consists primarily of Hamas-led intransigents based in the Palestinian Authority and Hizbullah units operating in southern Lebanon. Their ability to endanger Israeli soldiers and civilians has transformed what was for long considered a minor irritant into a major operational burden."[20]

Israel is determined to have the capability to deter aggression by neighboring Arab states and pro-Palestinian groups.

Iran and Iraq will pose ballistic missile threats to the United States within the next 15 years. These threats involve few missiles with poor accuracy, lower yield, survivability, reliability, and range-payload than faced in the Cold War. Some believe that these weapons will deter US intervention in regional crises and that their deterrent value is not in their effectiveness, but in the threat of their use. Some analysts state that the probability of nuclear weapon use is actually greater now than in the Cold War and will continue to grow. Projections predict that US territory is probably more likely to be attacked with weapons of mass destruction from non-missile delivery means than by missiles, primarily because non-missile delivery means are less costly, easier to acquire, and more reliable and accurate. However, in regional contexts, these missiles are likely to grow in importance and attractiveness. Iran is very active in missile and WMD development programs and is seeking foreign missile, nuclear, chemical and biological technologies. Iran's program is one of the largest in the Middle East, with Iran already deploying hundreds of short-range ballistic missiles aimed at Iraq. Recently deployed, the 1,300 km Shahab-3 medium range missile can now reach into Israel, most of Saudi Arabia and Turkey.[21] Iran has plans for longer-range missiles as well but claims that they are intended for space delivery vehicle use only and not for military use. Iran has been buying from Russia, China, and North Korea but is becoming self-sufficient in production of these systems. US intelligence sources see Iran's concerns as mainly regional but the United States will likely be within its ballistic missile range within 15 years. However, shorter range systems could be used if moved within striking distance of the US by ship or by deployment to lands closer to the mainland.[22]

Iraq continues to pose a serious threat in WMD. The chemical weapon program during the 1990s "demonstrated that a wide variety of delivery platforms can be used to disseminate chemical agents. They can range from the unsophisticated plastic bags used by the Aum Shinrikyo to ballistic missiles, on which Iraq had loaded chemical warheads. Iraq also had chemical munitions for its rockets, aerial bombs, and artillery, as well as aerial spray tanks."[23] Furthermore, Iraq has reportedly tested a short-range liquid-fueled ballistic missile capable of carrying chemical or biological agents as recently as July 2000, in spite of ongoing world scrutiny over its WMD efforts. During the 1980-1988 Iran-Iraq war, in which both sides involved used ballistic missiles hurled at each other's capital in the "War of the Cities," Iran used chemical weapons against Iraq in retaliation for Iraqi use and to this day, Iran considers these weapons to be force multipliers. The Department of Defense has determined that Iran's program now includes the production of blister, blood, and choking agents and is working on nerve agents.[24] Syria and Libya also are believed to have chemical weapons. In Syria's case, these stockpiles are possible force multipliers against Israel.

Chemical and Biological Weapons: Possession and Programs Past

Known	Probable	Possible	Former
Iran - Chemical	China – Chem/Bio	Algeria - Chemical	Canada – Chem/Bio
Iraq - Chemical	Egypt – Chem/Bio	Cuba - Chemical	France – Chem/Bio
Libya - Chemical	Ethiopia - Chemical	Iraq - Biological	Germany – Chem/Bio
	Iran - Biological	Israel - Biological	India - Chem
	Israel - Chemical	Libya - Biological	Japan – Chem/Bio
	N. Korea - Chemical	N. Korea - Biological	S. Africa – Chem/Bio
	Pakistan - Chemical	Pakistan - Biological	U.K. – Chem/Bio
	Russia – Chemical	Russian - Biological	USA – Chem/Bio
	Syria - Chemical	Sudan – Chem/Bio	Yugoslavia - Chemical
	Taiwan - Chemical	Syria - Biological	
		Taiwan - Biological	
		Vietnam - Chemical	

25

Known- where states have either declared their programs or there is clear evidence of chemical or biological weapons possession
Probable- where states have been publicly named by government or military officials as 'probable' chemical or biological weapons possessors or as producing chemical or biological weapons
Possible- where states have been widely identified as possibly having chemical or biological weapons or a CBW program by sources other than government officials
Former- where states have acknowledged having a chemical or biological weapons stockpile and/or CBW program in the past

In Asia, North Korea has a motivation to acquire nuclear weapons or the suspicion that it has nuclear weapons to encourage war to unite the South with the North. If unsuccessful, the North could threaten the escalation of nuclear war to at least settle on terms that maintain the status quo. Furthermore, such threats make the need to threaten Chinese intervention much less important and therefore much less risky for North Korea. Nuclear weapons can become the "last ditch" defense rather than escalation of a war with Chinese intervention.[26] Regarding chemical weapons, defectors report that "North Korea produces twenty different chemical agents for use in weapons at more than a dozen sites." Estimates suggest an existing stockpile of 1,000 to 5,000 tons of agents with twice that amount in annual production capability.[27] Other states in Asia such as Japan, are considered to possess "virtual arsenals" that although they do not exist, can be built in relatively short time frames as a result of the technological capabilities of the state. Japan certainly has the technological expertise and

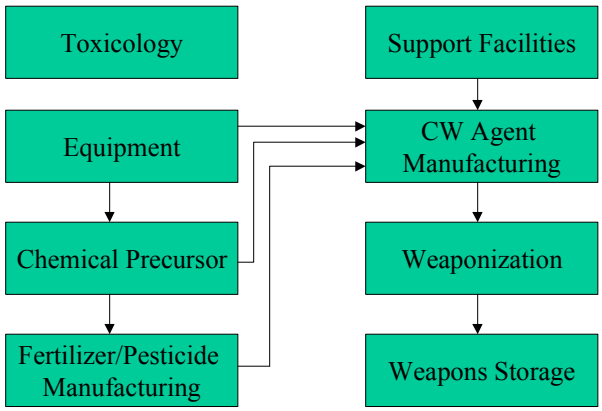
materials to build a nuclear arsenal should it desire to do so.[28] China's nuclear arsenal remains relatively small with only about 300 strategic weapons deployed and the remaining warheads in storage. China does possess a triad but only 4 land-based ICBMs are estimated as capable of reaching the United States.[29] As stated earlier, China is expected to remain focused on internal growth with regional concerns and is not expected to be a direct threat to the US in the next 15 years.

In South Asia, the Pakistan-India duel is expected to remain the hot spot in the region. Pakistan has retained its nuclear program and the recent events in Afghanistan have resulted in the US lifting previously imposed economic sanctions against the country. Analysts estimate that the Indian nuclear weapons program is larger and more diversified than the Pakistani program and will eventually lead to an asymmetric advantage for India. Pakistan's relatively incapable conventional forces also lead to the conclusion that they would go nuclear earlier in a conflict of national survival as compared to India. Hence, the nuclear arsenals in this volatile area may be less stabilizing than larger conventional forces.[30] India and Pakistan both claim that their nuclear arsenals are for minimum deterrent value only, although the definition of "minimum" has not been disclosed. Additionally, India has led the formulation of nuclear use policy with a declared "no first use" policy while Pakistan has not disavowed first use. Realizing the dangers of accidental nuclear launch or mistaken opponent activities, both countries have agreed to confidence building measures to ensure that their nuclear arsenals are not inappropriately alerted and perhaps used. But as recent events have shown, tensions run high and potential intentional use cannot be discounted.

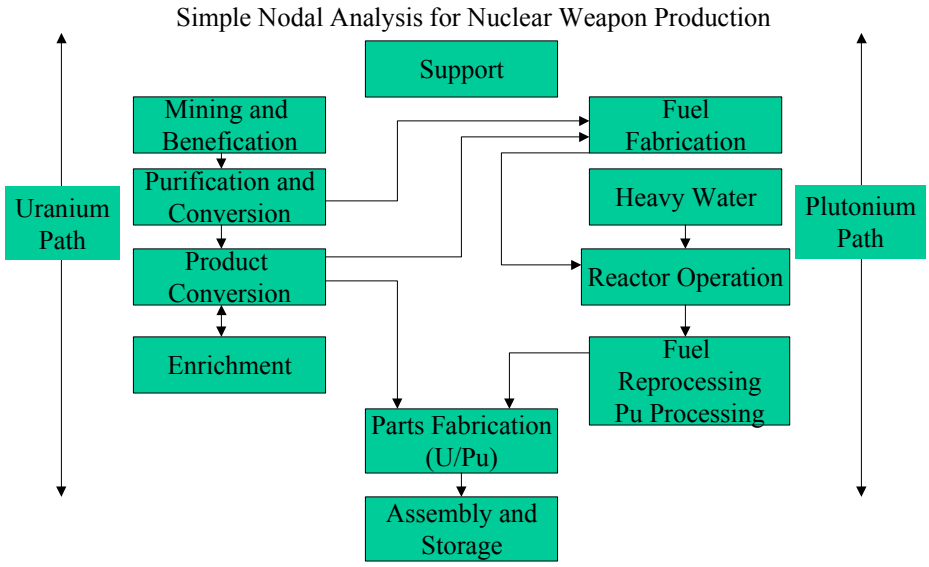
Regarding the use of biological or chemical weapons (BCW) experts admit that the threat is pervasive. "With modern advances in biotechnology and pharmaceutical manufacturing, there is a

threat of attack against US society from a growing number of nations and terrorist units."[31] As the case with nuclear weapons, experts remind the reader that there is a vast difference between making some chemicals and deploying a chemical weapon. The chart below represents a simple nodal layout of the steps necessary to produce chemical and nuclear warheads and is a useful way of preparing target sets for possible preemptive strikes. Classified details of such charts are used to plan and execute military operations in the ongoing fight on terrorism.

Simple Nodal Analysis for Chemical Agent Weaponization



32



Non-state actors pose serious new challenges to deterrence. For the 33 terrorist groups currently on the US list as foreign terrorist organizations, the entire spectrum of WMD is a concern including a variant of a nuclear weapon called a radiological weapon.[33] These so-called "dirty weapons" are terror weapons that would be intended not for their mass casualty capabilities, but for their sheer terror. They are devised by taking any radiation producing elements and wrapping them in an explosive device. When the device is detonated, the radiological material is spread as far as the explosive and prevailing winds will carry it. Materials such as cesium-137, uranium, plutonium, and a host of other contaminants are readily available from commercial sources or waste fuel from reactors and would not require the precision purification and treatment facilities that traditional nuclear bomb material requires. The simplicity of the weapon makes its simple to build and difficult to find using traditional intelligence methods and analysis techniques. *U.S. News & World Report* recently ran a story as well as major television news channels that reported that al Qaeda terrorist group safe houses contained notebooks containing information on

building nuclear weapons.[34] Although these data are easily found on the Internet and in open source literature, they do point to the terrorist desire to obtain information about making a nuclear device – a desire that could more easily be satisfied with a radiological bomb. *The Christian Science Monitor* recently compared the efforts of Al Qaeda and the Japanese terrorist group, Aum Shinrikyo, which placed nerve agent in the subway station in Japan, noting that both organizations are well funded and persistent.[35] The chart below represents a simple nodal layout of the steps necessary to produce chemical and nuclear warheads and is a useful way of preparing target sets for possible preemptive strikes. [Classified details of such charts are used to plan and execute military operations in the ongoing fight on terrorism.]

DATE	CIRCUMSTANCES	NUCLEAR MATERIAL
9 Oct 92	Russian police intercept highly enriched uranium at train station in Podolsk. Material taken by worker at scientific lab in the city.	1.5 kg HEU
May 93	HEU discovered in a bank vault in Lithuania embedded in a shipment of beryllium.	100 grams HEU
29 July 93	Russian security forces arrest two naval servicemen attempting to smuggle material from naval base.	1.8 kg HEU
Mar 94	Russian agents in St. Petersburg arrest three people attempting to sell HEU.	3 kg HEU
10 May 94	Police in Tengen, Germany stumble upon plutonium in a businessman's apartment in a separate investigation.	6 grams Pu
Jun 94	Russian authorities investigate a tip from a naval officer and find HEU stolen from a shipyard in 1993.	4.5 kg HEU
13 Jun 94	Undercover police in Germany arrest a Slovakian trader selling HEU from Obninsk, Russia.	800 mg HEU
10 Aug 94	Undercover German police perform a sting and recover material from Obninsk, Russia on a flight to Munich.	360 gm Pu 560 gm MOX
14 Dec 94	Czech police arrest a Russian trader, a Czech physicist, and a Belarusian in Prague with stolen materials.	2.7 kg HEU
8 Jun 95	Russian undercover agents arrest three people including a worker from Elektrostal, Russia.	1.7 kg HEU
Dec 97	Russian inspection team visits physics institute in Sukhumi, Georgia and discovers missing inventory materials that have not been recovered.	2 kg HEU
29 May 99	Bulgarian customs officers discover materials hidden in a car crossing into Turkey. Material obtained form Moldova.	10 grams HEU
19 Apr 00	Police in Batumi, Georgia arrest four residents with material from an unknown source.	920 grams HEU

[36]

Given time and money, Al Qaeda is likely to at least be able to purchase or steal the materials needed to fashion a crude radiological weapon. The September 11, 2001 attacks on the World Trade Center and Pentagon should leave no doubt that with the means available, the terrorist organization is likely to employ such a weapon of pure terror. Furthermore, the September 11,

2001 attacks make the US State Department look silly when it recently published its *Patterns of Global Terrorism-2000* stating, "While the threat continues, 2000 saw the international community's commitment to counter-terrorism cooperation and ability to mobilize its resources grow strong than ever. As a result, state-sponsored terrorism has continued to decline, international isolation of terrorist groups and countries has increased, and terrorists are being brought to justice." [37] Indeed, this statement seems ridiculous given recent terrorist attacks. It is much too early to claim victory over terrorism or even success in rolling back the terrorist threat to the United States and the world. UN Security Council resolutions will do nothing to stop the terrorist threats against America unless backed by force – a lesson the United States seems bound to have to learn time and again.

According to the US State Department web-site on terrorism, Iran, Iraq, Syria, Libya, Cuba, North Korea, and Sudan continue to be the seven governments that the US Secretary of State has designated as state sponsors of international terrorism. Iran remained the most active state sponsor of terrorism in 2000. It provided increasing support to numerous terrorist groups, including the Lebanese Hizballah, HAMAS, and the Palestine Islamic Jihad (PIJ), which seek to undermine the Middle East peace negotiations through the use of terrorism. Iraq continued to provide safe haven and support to a variety of Palestinian rejectionist groups, as well as bases, weapons, and protection to the Mujahedin-e-Khalq (MEK), an Iranian terrorist group that opposes the current Iranian regime. Syria continued to provide safe haven and support to several terrorist groups, some of which oppose the Middle East peace negotiations. Libya at the end of 2000 was attempting to mend its international image following its surrender in 1999 of two Libyan suspects for trial in the Pan Am 103 bombing. (In early 2001, one of the suspects was convicted of murder. The judges in the case found that he acted "in furtherance of the purposes of…Libyan Intelligence Services.")

Cuba continued to provide safe haven to several terrorists and US fugitives and maintained ties to state sponsors and Latin American insurgents. North Korea harbored several hijackers of a Japanese Airlines flight to North Korea in the 1970s and maintained links to other terrorist groups. Finally, Sudan continued to serve as a safe haven for members of al-Qaeda, the Lebanese Hizballah, al-Gama'a al-Islamiyya, Egyptian Islamic Jihad, the PIJ, and HAMAS, but it has been engaged in a counter-terrorism dialogue with the United States since mid-2000.[38]

[39]

Faced with a host of potential regional conflicts and numerous terrorist factions the United States must use all elements of national power to bring pressure upon these groups to deter aggression against America.

Lessons Learned – Future WMD threats will be limited

Review of the status of the P5 nuclear nations and the status and projection of capabilities of smaller nations leads to the conclusion that US planners will be unlikely to face another Soviet Union-type threat in the foreseeable future. Instead, the US is likely to face nations or non-state actors that hold a small number of less reliable and less capable WMD. And although these weapons are significant to the safety and security of the general public, they do not represent threats of survival to the United States of America as a sovereign state. However, these threats may negatively impact the US way of life in areas such as electoral victories at polls, legal intrusions by the state, abandonment of civil liberties and privacy, the existence of habeas corpus, and prohibitions of Posse Comitatus, thereby changing American institutions and values (the American Way of Life). Even under limited threats of WMD use, however, US deterrence planners have a more difficult job, planning deterrent strategies against a much broader range of adversaries, while remembering the very large nuclear stockpile that still exists within the borders of Russia.

Notes

[1] See David M. Kunsman and Douglas B. Lawson, *A Primer of U.S. Strategic Nuclear Policy*, Sandia National Laboratories, Albuquerque, NM, 2001 and Joseph M. Siracusa and David G. Coleman, "Scaling the Nuclear Ladder: Deterrence from Truman to Clinton," *Australian Journal of International Affairs*, Vol. 54, No. 3, 2000, 277-296, and Michael O. Wheeler, "The Evolution of U.S. Nuclear Policy and Posture: Background to 2001," Science Applications International Corporation, October 2000.

[2] The author resolved commonalties from six works regarding trend analysis including, US Special Operations Command Alternate Futures Study, John Gies, 2001, and *Strategic Assessment 1999, Priorities for a Turbulent World*, Institute for National Strategic Studies, National Defense University, Wash. D.C., 1999, and *Joint Vision 2020*, US Government Printing Office, Wash. D.C., June 2000, and Jacquelyn K. Davis and Michael Sweeney, *Strategic Paradigms 2025: U.S. Security Planning for a New Era,* Brassey's, NY, 1999, and Michio Kaku, *Visions*, 1997, and *Strategic Challenges for the Bush Administration: Perspectives from the Institute for National Strategic Studies*, National Defense University Press, Wash. D.C., 2001.

Notes

[3] *Strategic Assessment 1999, Priorities for a Turbulent World*, Institute for National Strategic Studies, National Defense University, Wash. D.C., 1999, p4.
[4] Jacquelyn K. Davis and Michael Sweeney, *Strategic Paradigms 2025: U.S. Security Planning for a New Era,* Brassey's, NY, 1999.
[5] Dean Wilkening and Kenneth Watman, "Nuclear Deterrence in Regional Contexts," Santa Monica: Arroyo Center, RAND, 1994, p 33.
[6] *Strategic Appraisal 1997: Strategy and Defense Planning for the 21st Century*, editors Zalmay M. Khalilzad and David A. Ochmanek, RAND, 1997, p. 42.
[7] Andrew F. Krepinevich, Jr., Testimony before the Senate Committee on the Budget, February 12, 2001.
[8] Robert S. Norris and William M. Arkin, *NRDC Nuclear Notebook*, vol. 56, no. 2, March/April 2000, p. 79.
[9] Press Release, Department Of State, 5 Dec 01.
[10] *Strategic Appraisal 1996*, ed. Zalmay Khalilzad, RAND, 1996, p. 75.
[11] The New York Times, "Powell Says U.S. Plans to Work Out Binding Arms Pact," Todd S. Purdum, February 6, 2002.
[12] Ibid.
[13] Paul Mann, Aviation Week & Space Technology, July 31, 2000, Vol. 153, No. 5, p66.
[14] John Cappello, Gwendolyn M. Hall, and Stephen P. Lambert, "TRIAD 2025: The Evolution of a New Strategic Force Posture," *Nuclear Deterrence and Defense: Strategic Considerations*, USAF Institute for National Security Studies, February 2001, p. 17.
[15] William H. Kincade, "Nuclear Proliferation: Diminishing Threat?", INSS Occasional Paper 6, USAF Institute for National Security Studies, US Air Force Academy, Colorado, December 1995, p 26.
[16] Willie Curtis, "The Assured Vulnerability Paradigm: Can it Provide a Useful Basis for Deterrence in a World of Strategic Multi-Polarity," *Defense Analysis*, Vol. 16, No. 3, Dec 2000, p. 244 quote of Stephen Maxwell, "Rationality in Deterrence", *Adelphi Papers*, 50, London: Institute for Strategic Studeis, 1968, p. 1.
[17] Wilkening and Watman, 247.
[18] Krepinevich.
[19] Avery Goldstein, *Deterrence and Security in the 21st Century: China, Briatin, France, and the Enduring Legacy of the Nuclear Revolution*, Stanford, CA, Stanford University Press, 2000.
[20] Stuart Cohen, "Israel's Three Strategic Challenges," *Middle East Quarterly*, Dec 99, Vol. 6, No. 4, p 45.
[21] *Strategic Challenges for the Bush Administration: Perspectives from the Institute for National Strategic Studies*, 35.
[22] Robert D. Walpole, testimony before the International Security, Proliferation and Federal Services Subcommittee of the Senate Government Affairs Committee, September 21, 2000.
[23] *The New Terror*, eds. Sidney D. Drell, Abraham D. Sofaer, and George D. Wilson, Hoover Institution Press, Stanford, CA, 1999, p 15.
[24] Ibid., 26.
[25] Center for Nonproliferation Studies, Monterey Institute of International Studies, Web-site, www.cns.miss.edu.
[26] *Strategic Appraisal 1996*, 174.
[27] *The New Terror*, 29.
[28] *Strategic Appraisal 1996*, 177.
[29] Ibid., 215.
[30] Ibid., 299.
[31] *The New Terror*, xviii.
[32] Ibid., 12.
[33] State press release, "Statement on Designation of Three Additional Foreign Terrorist Organizations, March 27, 2002, www. state.gov/secretary/rm/2002/9017.htm.
[34] David Kaplan, "Terror's Dirty Secret," *US news and World Report*, December 3, 2001, Vol. 131, No. 23.
[35] Peter Grier, "Loose Nukes," *Christian Science Monitor*, December 5, 2001, vol 93, issue 261.
[36] Data taken from "Trafficking of Nuclear Material: Significant Incidents," Christian Science Monitor, December 5, 2001, vol 93, issue 261.
[37] *Patterns of Global Terrorism –2000*, US Department of State, April 2001, www.state.gov/s/ct/rls/pgtrpt/2000/index.
[38] Ibid.
[39] Ibid.

Chapter III

Nuclear Deterrence

Nuclear deterrence theory has been debated since the birth of nuclear weapons and numerous books have been published that debate the utility of the theory to practical policymaking. Mark Clark, professor and chair of political science and director of the National Security Studies Program at California State University, San Bernardino, stresses the importance of useful theories when he writes,

> "The policymaker, however, needs the kind of urgent, practical knowledge that can help him or her decide whether to lift or enforce sanctions, strike militarily at certain production facilities, or stand down: decisions that affect the lives of citizens and soldiers of opponents and allies alike. Thus theory is frequently viewed as useful for the academy, while only practical knowledge serves policy. The best theories, however, should be practical in that their main ideas and conclusions help policymakers think through the larger problems they face."[40]

This paper will only discuss the main points of deterrence to provide a basic framework for discussion.

In one of the classic works regarding nuclear deterrence, William W. Kaufman describes deterrence in the most basic term as "preventing certain types of contingencies from arising."[41] To deter an aggressor, one must also communicate the consequences that the aggressor will suffer if it commits the aggression. In concert with communicating the costs of aggressive actions from one state to an aggressor, the issue of credibility becomes relevant. Specifically, the aggressor-state must believe that US capability and intentions, as well as costs to its nation associated with the

threat of nuclear actions are indeed credible. Kaufman says, "The enemy must be persuaded that we have the capability to act; that, in acting, we could inflict costs greater than the advantages to be won from attaining his objective; and that we really would act as specified in the stated contingency."[42] He goes on to explain that even after capability and cost issues are fulfilled, the intentions of the deterrer are perhaps the most delicate to be credible. He states that the aggressor "may be expected to use three main sources of information about the intentions of a country such as the United States: its record of performance in comparable contingencies during the recent past; the statements and behavior of its government; and the attitudes of public opinion, both domestic and allied."[43] A nations that seeks to deter aggression must display consistent public policy statements by government leaders, favorable public opinion (especially in democratic states) and corresponding national actions that support the credibility of the state to do those things that it has stated it would do.

More recent writings on deterrence by experts such as Robert Powell attempt to explain nuclear deterrence using game theory and brinkmanship. Using modern game theory, Powell shows how models that use discrete values for rewards and costs of nuclear exchanges can help underscore the theory of nuclear deterrence. And although he admits that these models often fall short of adequately explaining all nations' strategic choices for the obtaining or maintenance of nuclear weapons, they help one predict a state's possible actions given its level of resolve, the risks and rewards of escalation options from conventional to nuclear action, and several other more complex elements of statecraft.[44] Powell also discusses brinkmanship and captures the idea of uncertainty in a state's ability to control the escalation of war from conventional means to all out nuclear war. Brinkmanship then adds ambiguity and uncertainty to the neat and precise mathematical game models and may help explain why these realist models often fall short of

satisfactory explanations for state behavior. In particular, even in situations where states clearly have more to gain than the costs, ambiguity on the deterring state's possible responses may prevent the aggressor from ever starting down a path with no possible return.

Over the last 50 years the US nuclear deterrence strategy has evolved based upon geopolitical circumstances, US domestic economic conditions, and the agendas of the US heads of state. Accordingly, there is no reason to assert that today's environment of rising terrorism, failing communism and related state instability, and proliferation of Weapons of Mass Destruction (WMD) are anything other than the next forces to drive new nuclear deterrence policy. Furthermore, in his article "Does Deterrence Have a Future?," Lawrence Freedman, Professor of War Studies at King's College, London, asserts that the US evolving policy for nuclear weapons use and corresponding world stability "is as likely to be helped by a readiness to provide explicit warnings about the risks associated with a breach of a crucial limit as by matters being left ambiguous and uncertain, so that the limits only become apparent once they have been exceeded."[45] Once US leaders have grappled with the new challenges facing a deterrence policy, Freedman calls for a more overt statement rather than the ambiguity that was used periodically in nuclear deterrence policies of the past.

A veteran of foreign policy, Henry Kissinger, issued a similar call for a sound nuclear weapon use policy in 1957 when he wrote, "The test of strategic doctrine is whether it can establish a pattern of response – a routine – for the most likely challenges. The degree to which a society, in its relations with other groups, confronts situations which seem to it unexpected, reveals a breakdown of its strategic thought."[46] Kissinger called for sound thinkers to spend the time considering nuclear deterrence in light of the geopolitical circumstances and formulate a consistent

and planned policy with which others can almost predict the US response. Kissinger went on to say,

> "The basic requirement for American security is a doctrine which will enable us to act purposefully in the face of the challenges which will inevitably confront us. Its task will be to prevent us from being continually surprised. Our doctrine must be clear about the nature of our strategic interest in the world. It must understand the mode of Soviet behavior and not make the mistake of ascribing to the Soviet leaders a pattern of action in terms of our own standard of rationality."[47]

Kissinger's comments on a strategic doctrine to deal with the Soviets are as applicable to today's enemies as they were for the Soviets.

In his book, "The Second Nuclear Age," strategist Colin S. Gray contends that among several principal features of the present political environment is the probability that in the near future the United States is likely to find itself once again in a bipolar world. He discusses the present time as a "nursery of a succeeding bipolar era."[48] Gray follows the Clausewitzian thought that "no matter what impression to the contrary may be given by studies on the details of nuclear matters, nuclear policy and nuclear strategy are subject first and foremost driven by their political context."[49] He goes on to say that this bipolar world may include China, or other state with the same conclusion – "US ascendancy, primacy, is a wasting condition."[50] US nuclear deterrence should look to the future and make decisions now that will provide for defense in a scenario where indeed we return to a bipolar world. US policy then should include maintenance of a core intellectual thought and weapons infrastructure as a key for the future. Dennis M. Gormley pointedly recognized the importance of maintaining a core capability in nuclear weapons science when he says, "the nation's leadership must take concrete steps to sustain a strong nuclear deterrent. Leadership from the president and Congress is needed to support the Department of Energy's Stockpile Stewardship Program lest the nation's scientific talent erode even further."[51] And finally regarding this point, Robert McNamara and Thomas Graham maintain that it may still be early to

discount the Russian threat to the US. They write, "For the foreseeable future Moscow and Washington will remain at least potential adversaries, as evidenced by the nature of Russian objections to American missile defense plans. President Vladimir Putin has already said that a Bush-led breakdown in the ABM Treaty would provoke Russian to increase its nuclear capability, a point echoed by Vladimir Rushailo, secretary of Russia's Security Council, in reacting to Mr. Wolfowitz's recent Senate testimony."[52] And although the Russians have seemingly accepted the US pullout from the ABM, their desire to use legal, binding agreements to reduce both nations' nuclear stockpiles suggests remaining reservations toward US intent.

The Age of the Regional Hegemon

A second factor that will help shape evolving nuclear deterrence strategy is the rise of regional actors possessing nuclear or other WMD. Colin s. Gray includes this factor as one of his six features of the "second nuclear age."[53] Additionally, Gormley recalls, "an Indian general argued that the primary lesson from the Gulf War for the developing world was the necessity to confront American conventional dominance with nuclear weapons. Thus, WMD proliferation is in part an asymmetric response to America's conventional dominance. Serbia's capitulation in Kosovo is likely to reinforce the motivation of potential US adversaries to acquire WMD."[54] Although these examples involved state actors, non-state actors as well may have the means to asymmetrically challenge a US that is unwilling to use its nuclear arsenal. In an article discussing the possibilities of conventional weapon deterrence, Edward Rhodes reminds us that "Many potential adversaries are, at least at times, undeterrable. The nature of conventional deterrence is that it regularly fails, even in cases in which commitments to respond are 'clearly defined, repeatedly publicized, and defensible, and the committed state gives every indication of its intention to defend them by force if necessary.'"[55] Rhodes points to situations that may require a nuclear deterrent to deter a state

that is not deterred by conventional forces, regardless of the overwhelming strength of the US in this area.

Finally, the US must openly commit to a nuclear deterrence strategy that considers each of the issues above. It must clearly state its nuclear policies if deterrence is to work in this multipolar environment. As Gormley recounts the 1998 findings of the DSB [Defense Science Board],

> "This panel of outside experts found that, with one exception, declaratory policy adequately reflected the importance of robustly underwriting the concept of nuclear deterrence against a range of threats. The exception lay in the area of policy statements on deterring weapons of mass destruction with nuclear threats. Here the DSB concluded that declaratory policy was more ambiguous than seemed useful, particularly regarding the issue of threatening nuclear responses against nonnuclear states that might brandish biological or chemical threats."[56]

This shortcoming should be remedied.

Although ambiguity has always accompanied US nuclear deterrence regarding when, where, and how they may be used, US policy must be clear to deter undesired behavior. In fact in several instances, the US has undermined its ambiguity by openly revealing that it has never seriously considered using nuclear weapons since Hiroshima and Nagasaki. One case in point was after the 1991 Gulf War where David Wood recalls, "Eventually, the United States issued a veiled warning. But no explicit threat of nuclear retaliation was made or even considered. 'Among ourselves, we said if he used chemicals we would not respond with nuclear weapons,' said Brent Scowcroft, Bush's national security adviser. Instead, the White House would have intensified non-nuclear air strikes against Baghdad."[57] Situations like this remove ambiguity and provide more certainty that nuclear weapons will not be used. Such open communications of our intent should be significantly limited if our credibility regarding nuclear policy is to be maintained. Policymakers must carefully review the modern strategic environment and develop a clear nuclear deterrence policy that will deter escalation of war that includes the use of nuclear weapons or other

WMD. This paper asserts that formulation of a nuclear deterrence policy is not only possible, but also necessary to continue the record of deterring nuclear war and the use of WMD in the 21st Century.

Armed with the some lessons learned from the Cold War (the old geopolitical context) and the outlook for the geopolitical context for the next 15 years, this paper now addresses hindrances to maintaining a nuclear deterrent to address this world disorder. First, there is a review of some relevant treaties that apply to how the United States builds the nuclear deterrent to be consistent with these state obligations. Second, this will be followed by an assessment of recent US statements identifying probable adversaries toward which US deterrence policy must be effective. Third, this paper will review the status of the nuclear deterrent by reviewing the US capabilities and credibility.

Inhibitors to a New Deterrent – Treaties

The need to prevent the proliferation of nuclear weapons was evident from the first days of the nuclear era. As early as November 15, 1945, the United States, Canada and the UK proposed the elimination of atomic energy for destructive purposes. In fact, the United States offered the Baruch Plan of 1946 that advocated placing all nuclear resources under international ownership and control.[58] This plan failed and by 1964, the Soviet Union, the UK, France, and the Peoples Republic of China, became nuclear-weapon states. Nuclear power plant technology was burgeoning and it was estimated that by 1985 more than 300 nuclear power reactors would be operating, under construction, or on order. As these nuclear reactors produced not only power, but plutonium, it was estimated that by 1985 the quantity of plutonium being produced worldwide would make possible the construction of up to 15 to 20 nuclear bombs daily. As the major powers neared an acceptable draft of the Non-Proliferation Treaty (NPT), the concerns of the non-nuclear

powers centered particularly on two main issues: the need for safeguards to detect and deter the diversion of nuclear materials from peaceful to weapons use; and the need for assurances that renunciation of nuclear arms would not place them at a permanent military disadvantage and make them vulnerable to nuclear intimidation.[59]

To satisfy non-nuclear state concerns over the issue of safeguarding nuclear materials, each of the nuclear states eventually placed their nuclear sites under the same inspection regime as the non-nuclear states. Regarding security assurances, in 1968 the United States, the Soviet Union, and the United Kingdom submitted a tripartite proposal that security assurances take the form of a U.N. Security Council resolution, supported by declarations of the three powers. The resolution, noting the security concerns of states wishing to subscribe to the Non-Proliferation Treaty, would recognize that nuclear aggression, or the threat of nuclear aggression, would create a situation requiring immediate action by the Security Council, especially by its permanent members. In addition to this "positive" security assurance, the United States in 1978 issued a policy statement on "negative" security assurances stating, "The United States will not use nuclear weapons against any non-nuclear weapon state party to the NPT or any comparable internationally binding commitment not to acquire nuclear explosive devices, except in the case of an attack on the United States, its territories or armed forces, or its allies, by such a state allied to a nuclear weapon state, or associated with a nuclear weapon state in carrying out or sustaining the attack."[60] The treaty entered into force on March 5, 1970 and was signed by 185 countries including Iran, Iraq, Libya, and North Korea. India, Pakistan, and Israel are among the countries that did not sign the agreement. In the 1995 NPT extension conference the United States renewed the negative assurance statement through Secretary of State Warren Christopher, signaling the advantages available to states that choose to remain non-nuclear. Recommendations to depart from the NPT

must be balanced against the loss of both positive and negative security assurances that have proved effective at limiting nuclear weapon proliferation to many signatories of the treaty.

The Comprehensive Test Ban Treaty (CTBT) also has implications for US nuclear deterrence strategy. The CTBT bans all nuclear explosions in order to constrain the development and qualitative improvement of nuclear weapons, end the development of advanced new types of nuclear weapons, contribute to the prevention of nuclear proliferation and the process of nuclear disarmament; and strengthen international peace and security. Compliance with the CTBT raises serious questions on the extent to which US nuclear weapons can confidently be modified to more closely fit with emerging missions of deterrence or possible use if deterrence fails.

Enroute to a true CTBT, in July 1992, President George Bush determined that the United States would not conduct nuclear tests to develop new nuclear weapon designs for force modernization purposes. The Congress then imposed an eight-month moratorium on U.S. nuclear weapon tests and restricted subsequent tests even for safety and reliability purposes. In August 1995, President Clinton announced that U.S. support for a "true zero yield" Test Ban Treaty would be conditioned on six safeguards including: a successful Stockpile Stewardship Program; maintenance of modern nuclear laboratory facilities and cutting-edge research programs; the ability to resume nuclear testing if necessary; improving treaty monitoring capabilities; and developing broad intelligence capabilities. Another safeguard of paramount importance included an escape clause that specified that if a high level of confidence in the safety or reliability of a nuclear weapon type deemed critical to our nuclear deterrent can no longer be certified, the President, in consultation with Congress, would be prepared to withdraw from the Test Ban Treaty to conduct whatever testing might be required.[61]

In October 1999, the US Senate failed to ratify the CTBT raising speculation both in the US and abroad as to the message that the Congress was sending to the world. Apart from the Senate action, as of early 2002 the CTBT has been signed by 160 countries and ratified by 69, but cannot enter into force until the United States ratifies it and India, Pakistan, and North Korea join the other signatories. The Test Ban Treaty makes it very difficult for countries with nuclear weapon programs to modernize crude single-stage designs into sophisticated thermonuclear designs.[62]

Inhibitors to a New Deterrent – Who is the Enemy?

Efforts to thwart the proliferation of WMD and especially Biological and Chemical weapons have been characterized as "working by not succeeding." Richard N. Haass, Director of Foreign Policy Studies, Brookings Institution writes,

> "The BCW threat is not going away and appears to be getting worse. BCW offer a less difficult and less expensive production options than either advanced conventional weapons or nuclear weapons (NW). They are also easier to conceal. And they can be used in both traditional settings (battlefields) and against civilian targets as a form of terrorism. Indeed, it is possible that US advantages in other forms of warfare may have the result of increasing the desirability of this option to states and other actors."[63]

Haass makes the unpopular observation that US strengths are driving our potential enemies, state and non-state, to cheaper, more easily achievable, asymmetric forms of warfare in WMD and BCW in particular.

What is the role that nuclear deterrence may play against state and non-state WMD use? As stated earlier, deterrence involves the capability of US nuclear warhead effectiveness and the credibility that the US would use them. Some critics point to the ambiguity in US nuclear strategy as purposefully concealing actual intent and therefore supporting the credibility that nuclear weapons would be used in a conflict. This paper contends, however, that many analysts and political figures have confused strategic ambiguity with poor planning. It is the contention of the

author that not only are US adversaries left with ambiguous ideas of whether the US will employ nuclear weapons in a given scenario, but the US policymakers are as unsure as probable US opponents. US officials do not have a clear nuclear use policy and therefore are just as confused as our allies and probable opponents. The US Executive Branch can and should certainly use ambiguity to keep enemies off-guard, but it must have a credible and clear nuclear policy upon which to base policy and a framework upon which to build options and weigh costs and benefits of conventional versus nuclear strikes.

Another impediment to the establishment of a nuclear deterrent is the relatively recent record of US fighting against rogue leadership rather than opponent populations. For instance, in the Gulf War, President George H.W. Bush declared that the United States was at war with the regime of Saddam Hussein and not the Iraqi people.[64] Just this year, President George W. Bush proclaimed similarly that America was at war with the Taliban regime and the terrorists of Al Qaeda as well as all terrorists around the world; not with people of Afghanistan or Muslims around the world.[65] While these statements are clearly intended to maintain support of world public opinion as well as that of the American people, they are a sharp contrast to America's attitude in WWI and WWII. The European allies and the United States were at war with the countries of Germany and its allies in WWI and with Germany, Japan, and Italy in WWII – that is the people and leadership of those countries. Hence, at the end of the war, total surrender was expected and the victors demanded significant reparations, carefully crafted restrictions, and admissions of guilt from the countries that committed the aggression. By targeting the US fight merely with the leadership of opposition countries, the American leadership is making it very difficult to ever justify the use of nuclear weapons in retaliation for enemy actions against the United States, regardless of how devastating they may be. It is difficult to imagine a case where a

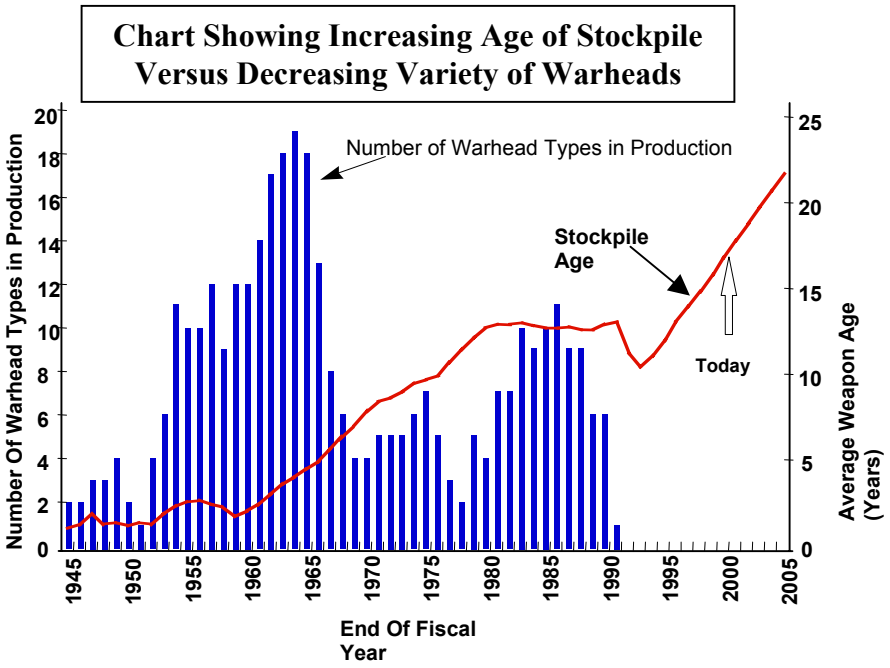
nuclear weapon is the weapon of choice to retaliate against a single leader or regime for crimes committed. On the other hand, if the United States acknowledged the fault of a country's general population in allowing its leaders to remain in power while committing crimes and inhumanity against its own population as well as the world, it would appear that there would be more sufficient justification to use a nuclear weapon and retaliate against heinous acts. A nuclear weapon is indiscriminant in who it kills and targets must therefore be relatively large to meet the demands of the law of proportionality in US attacks.

Inhibitors to a New Deterrent – US Capabilities

Another inhibition to the establishment of a nuclear deterrent involves the capability of the United States. When discussing the elements of a valid deterrent, the capability and credibility factors, most analysts simply assume that the United States has unlimited capability. Arms Control efforts have been aimed at reducing US and Russian stockpiles for years. In December 2001, the United States and Russia celebrated the successful attainment of START I levels as each country met its obligation of having less than 6000 strategic delivery vehicles in active deployment.[66] The world recognized this goal as a major milestone in arms control and applauded the two countries as they vowed to decrease their warhead counts to between 1700 and 2200 warheads. As stated earlier in this paper, while the specific details of the Putin-Bush agreement were not hammered out, the world recognized that the general direction of stockpiles was headed in the correct direction: down. More significant perhaps than the details of this agreement was the Russian reaction to the US announcement on December 12, 2001 that the US would pull out of the 1973 ABM treaty – long heralded as one of the most important arms control agreements in history. The fact that Vladmir Putin barely commented on the US decision may point in part to a new attitude of trust between the two countries. But are US capabilities as unlimited as many assume?

This author would suggest that since the end of nuclear testing in 1990 and the indefinite extension of nuclear warhead life-cycles, the US capability to maintain confidence in its stockpile of nuclear weapons is more uncertain each year. The National Nuclear Security Administration, under the Department of Energy, is responsible for the safety and reliability of the US nuclear stockpile. With nearly 10 years since the last nuclear test, and nearly all US warheads on operational duty beyond their anticipated life-spans, many in the Department of

67



Defense and Department of Energy are growing concerned at the viability and reliability of these weapons. In fact, NNSA analysts have been talking for several years about how they might go about picking the choicest of the lot if asked by the President to prepare a select group of weapons for deployment. And although the Secretaries of Energy and Defense, along with the Directors of the National Laboratories, have signed annual certification letters to the President for the past 6 years saying "all is well," concerns are growing. Affectionately known as the Annual Certification Process, each year the experts in the DoD and DOE notify the president as to whether the stockpile has any defects that require an underground nuclear test to diagnose and perhaps repair.

This process, originally part of the Clinton escape clause in the Comprehensive Test Ban Treaty, known as Safeguard F, has given the nation's best and brightest scientists and military planners the opportunity to advise the President on the health of the stockpile.[68] Each year these reports become increasingly controversial as every word and sentence are carefully crafted to tell the President that there are growing concerns, but that the stockpile remains healthy, able to meet all military requirements.[69] Nonetheless, if DoD were called to use a nuclear warhead today or tomorrow, the DoD and DOE would not likely simply call a random warhead into service. The decision on which specific tail number would be called upon would likely be held at the highest level within the DoD and DOE to ensure the warhead that was selected was most likely to work as advertised. Imagine the ramifications should a president call a nuclear warhead into action and it fail to detonate and achieve a nuclear yield. The capability of the entire US arsenal would then be suspect and the US nuclear deterrent would be shattered. This point cannot be overstated for on it hinges assumptions about power, status, and prestige in world politics and military capability.

In one respect then, it is to the advantage of the United States not to have to use a nuclear weapon and thereby keep its perceived capabilities intact around the world. Should a US weapon not function properly, US allies and prestige would be dealt a severe blow and rogue actors would be emboldened to act against the US quickly, while it tried to regain its edge. In this scenario, the US would be pushed to use other nuclear warheads to show that the deterrent was still intact. A failed US nuclear event would provide opponents a window of opportunity either against the US or against regional opponents that the US can no longer protect with its nuclear deterrent, although US conventional strength may still pose a deterrent value. Scenarios like these make the stakes in a nuclear threat even higher than they appear without such concerns. With an already high threshold to use a nuclear weapon, scrutinizing a cost-benefit analysis becomes more skewed with

the possibility that the stockpile would not perform. The capability factor then becomes a credibility issue and we are back into the conundrum of the nuclear deterrent.

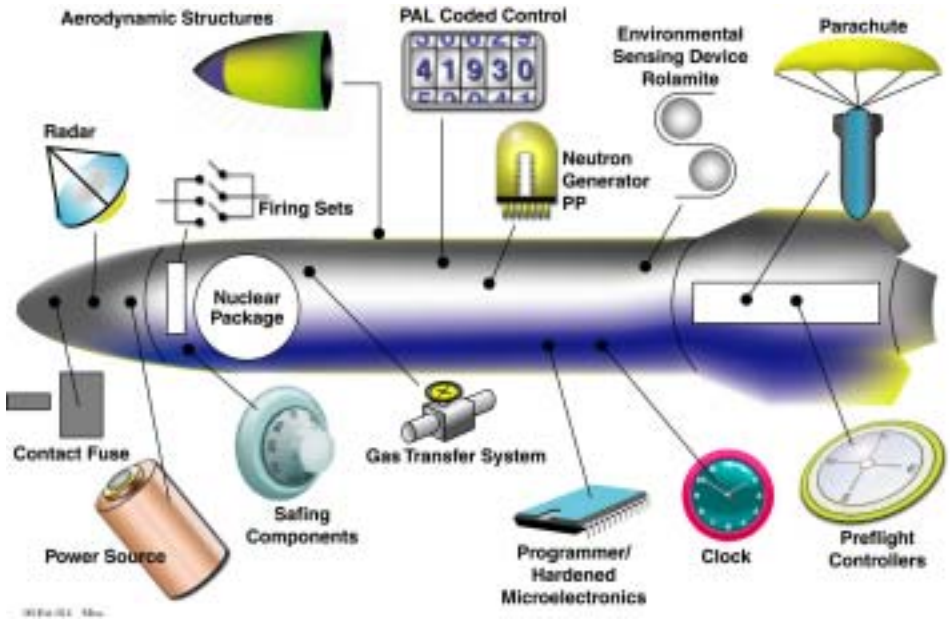
Repairing the nuclear stockpile is something that can not be done quickly or easily. The United States needs the people and the manufacturing and experimental infrastructure to care for the nuclear stockpile and maintain the capability behind the nuclear deterrent. Recent estimates indicate that only 10% of the nuclear weapon scientists have any experience while the US was actively building and testing new weapon designs. Additionally, in its 1999 report, the Chiles Commission observed that the average age of those supplying critical skills to the weapons program is 48 years—a population considerably older than that for the average U.S. high-tech industry.[70] For those young scientist that have chosen to start careers in the nuclear laboratories, the labs are not exercising the full range of skills needed to develop sound scientific judgement. The nuclear labs are limited to performing warhead maintenance and not working on new warhead designs that would better serve to maintain our design capabilities for the future or to pass on these skills to a new generation of designers/engineers. Furthermore, recruiting and retention of young scientists and craftsman in the manufacturing complex are showing reason for concern. Fewer college graduates are showing interest in nuclear weapons work as a career, and younger scientists at the three national laboratories responsible for this work are leaving for higher paying and more secure jobs in the civilian sector.[71] Without a clear path to a satisfying career in national defense, laboratory workers are looking elsewhere to find meaningful work for the security of their families as well as their professional desires.

Workers at the national laboratories have based their future prospects on two very visible pieces of evidence. First, they have observed the "back-burner" approach given to nuclear weapons under the Clinton Administration, from the disdain of the military, to the unimportance

placed on nuclear weapons in political discourse and foreign policy. Secondly, employees of the nuclear weapon laboratories have watched as budgets for the DOE Defense Programs have consistently under-funded the Stockpile Stewardship Program in both the experimental and scientific side of the house as well as the manufacturing side of the house. Although budgets have gone up over the last few years, they have nonetheless remained insufficient to accomplish what needs to be done. The call for strong leadership, clear priorities, first-rate equipment and facilities, sufficient and stable funding, and a firm national commitment to stockpile stewardship must be heard to attract, train, and retain new generations of outstanding scientists and skilled technicians.

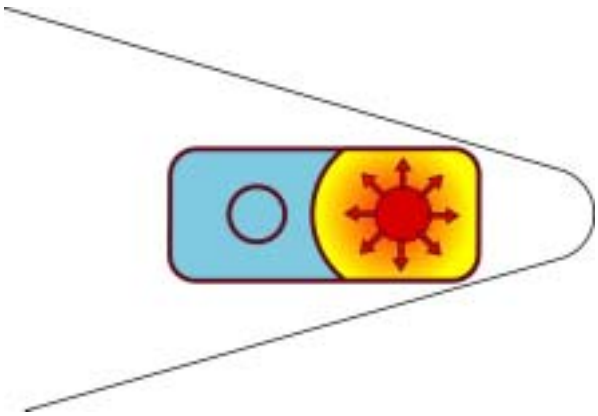
Regarding the manufacturing and experimental infrastructure to care for the nuclear stockpile, the US remains vulnerable. Each nuclear weapon consists of approximately 6,000 parts, the vast majority being non-nuclear. The nuclear weapons complex must retain the ability to replace each and every part of every weapon should the need arise, potentially with new technologies to replace sunset technologies. To date, the manufacturing capabilities within the DOE as well as the external commercial industries, remain inadequate for the task as the supplier base for parts and materials has withered aware in search of more lucrative business enterprises. Historically, stockpiled nuclear weapons were replaced by newer more modern ones approximately every eight years**.** In these cases, weapons were produced with sufficient spare parts that they could be repaired and returned for duty with little logistical problems. Today, with a stockpile that has remained in service longer than any time in US nuclear history, weapons are running or have run out of spare parts that are readily available. "Extra" weapons available because of treaty reductions and other government decisions are being used to keep front-line warheads up and

ready. Weapons from the 1960s and 1970s require parts from sunset technologies that are no longer available or from manufacturers that have gone out of business because of low demand.



72

On the nuclear component side, the problems are typified by the challenge of remanufacturing replacement plutonium pits (the trigger for modern two-stage thermonuclear warheads). Surveillance programs have already been changed to ensure enough pits are available for warfighting requirements. Surveillance testing on other components has also changed to help conserve low part supplies. The issue regarding pits has been ameliorated to some extent as experts agree that pits are aging more gracefully than initially anticipated with lifetimes between 50-60 years. However, sooner or later every warhead component will require repair or replacement and the nuclear weapon complex is simply not ready at this time. Without fail, experts that have assessed the state of the nuclear weapons complex have concluded that the physical



infrastructure has been allowed to deteriorate to unacceptably low levels. They consistently call for serious revitalization plans to ensure that the U.S. nuclear weapon production complex can meet future refurbishment and remanufacturing needs. [73]

Lastly, once warheads are assessed and repaired, can they be certified through testing, simulation and analysis to assure they will work as intended? Again, the answer is problematic. Fortuitously, all but a handful of the approximately 4000-6000 parts of a nuclear weapon, including all safety- and reliability-critical electrical, mechanical, and arming subsystems, are outside of the Nuclear Explosive Package (NEP) and can legally be tested using non-nuclear tests and experiments. However, certification of warhead survivability against the effects of other nuclear warheads is problematic without underground nuclear testing. While the reliability tests of the non-nuclear parts are relatively straight forward, there remain concerns about how these changes in close proximity to the NEP, affect the performance of the NEP.

During the Cold War, the U.S. conducted over 1000 nuclear test explosions to either conduct new warhead development or to examine certain warhead concerns or anomalies noted during underground nuclear tests. In some cases, the results of these tests surprised scientists that thought they understood the impact of a "minor" change in a warhead design – in some cases these were minor changes outside the NEP. Hence, the pessimism and conservatism of today's nuclear scientists.

Inside the NEP, even seemingly insignificant modifications may have unexpected consequences on warhead performance. Although the United States now maintains a stockpile of well tested, safe, and reliable warhead designs, future changes are sure to come. The experimental side of the nuclear weapons

complex must have tools to assess the impact of repairs or modifications to a warhead. Here again the nuclear weapons complex is vulnerable. Advanced experimental tools such as the Dual Axis Radiographic Hydrodynamic Test facility (DARHT), and the National Ignition Facility, are required to assist new supercomputers in modeling the impacts of changes in warhead designs so that these systems can ultimately be certified for use in the US nuclear stockpile. The funding levels in the Stockpile Stewardship Program (SSP) have caused multi-year delays in the building of critical scientific tools needed to allow modification of the existing stockpile for possible new applications in the 21st century. Critical to the training of our newest scientists and nuclear warhead designers, the Stockpile Stewardship Program aims to offset the loss of underground nuclear testing with new advanced experimental tools and unparalleled supercomputer capabilities/simulation. Scientists without the benefit of extensive underground nuclear test experience must apply these new advanced tools and simulation capabilities under the tutelage of senior designers and engineers before the retirements of these nuclear-test-era workers. Rather than drawing upon years of nuclear test experience to make judgements regarding the health of the nuclear stockpile, new scientists will draw upon these new tools and the lessons learned from those senior scientists that go on to retirement. The success of this "race" is not certain. It's failure is assured if we don't appropriately fund the program.

Finally, if US scientists were required to perform a nuclear test in order to diagnose or verify a repair to a nuclear weapon, the Nevada Test Site (NTS) would be required to perform such testing. Under the Clinton Administration and continuing into the Bush Administration, NTS readiness requirements have been set at a 2-3 year standby.[74] Nuclear scientists and policy analysts will admit that current ability to perform a complex test is at the end of that presidential-directed time limit of 3 years; simpler tests may be performed in less time. Additionally, current

so called "sub-critical" tests fail to exercise the full complement of functions necessary to be capable of restarting underground testing if required. These include specialties such as high-fluence nuclear diagnostic instrumentation, containment, design and emplacement of diagnostic equipment in a vertical shaft, drillback and radiochemical analysis.[75] The technicians, scientists, and tradesman required to perform these tasks are in many cases no longer around to perform a test if required. Special equipment, including large cranes and other one-of-a-kind equipment is currently not available because of maintenance problems from non-use or because of long lead-times to order new equipment. It is possible that if a test is needed to quickly determine whether a warhead would work, such a test could be performed sooner than in three years, but advanced tests with full instrumentation and pre-analysis of the warhead technical issues would stress the three-year time limit. A failure at the NTS would raise serious questions about the vitality of all US warheads and would seriously compromise the capability of the deterrence force.

The sky is not falling, but the US must take the steps now to ensure that the nuclear deterrent force remains credible and capable in the coming decades. The many dedicated professionals at the NNSA, the national laboratories, and DoD organizations know the things that must be done to maintain the deterrent. They simply must be given the guidance, leadership, and appropriate resources to do the job.

Notes

[40] Mark T. Clark, "How Nations Decide To Go Nuclear," *Orbis*, vol. 45, issue 3 (Summer 2001): 466.
[41] William W. Kaufman, *Military Policy and National Security*, (Princeton, N.J.: Princeton University Press, 1956), 17.
[42] *Ibid*., 19.
[43] *Ibid*., 19.
[44] Robert Powell, *Nuclear Deterrence Theory*, (Cambridge, N.Y.: University Press, 1990), 184.
[45] Lawrence Freedman, "Does Deterrence Have a Future?," *Arms Control Today*, October 2000, 8.
[46] Henry A. Kissinger, *Nuclear Weapons and Foreign Policy*, (New York, N.Y.: Harper & Brothers, 1957), 404.
[47] *Ibid*., 405.
[48] Colin S. Gray, *The Second Nuclear Age*, (Boulder, Colo.: Lynne Rienner Publishers, 1999), 39.
[49] *Ibid*., 39.
[50] *Ibid*., 40.
[51] Dennis M. Gormley, "Facing Nuclear and Conventional Reality", *Orbis*, vol. 44, issue 1 (Winter 2000): 117.
[52] Robert S. McNamara and Thomas Graham Jr., "Nuclear Arms Still Keep the Peace," *Washington Post*, 15 Jul 2001.

Notes

[53] Gray, 39.
[54] Gormley, 226.
[55] Edward Rhodes, "Conventional Deterrence", *Comparative Strategy*, vol. 19, issue 3, (Jul-Sep 2000): 221.
[56] Gormley, 226.
[57] David Wood, "Dying Doctrine?", *Army Times*, 11 September 2000.
[58] Treaty on the Non-proliferation of Nuclear Weapons, www.state.gov/www/global/arms/treaties/npt1.html.
[59] Ibid.
[60] Ibid.
[61] Summarized from Jonathan Medalia, "Nuclear Weapons Testing and Negotiation of a Comprehensive Test Ban Treaty," www.fas.org/spp/starwars/crs/92-099.htm.
[62] Ibid.
[63] *The New Terror*, 404.
[64] President George H. W. Bush, speech announcing the U.S. Attack of Iraq, Washington, D.C. January 16, 1991.
[65] President George W. Bush, speech announcing U.S. attack against Taliban, Washington, D.C. September 20, 2001.
[66] *United States Department of State START Treaty Final Reductions*, Press Release, December 5, 2001.
[67] Taken from working briefing materials from National Nuclear Security Administration (NNSA), 2002.
[68] President Bill Clinton, speech announcing US commitment to a CTBT, Washington D.C. Aug 11, 1995.
[69] Based upon author's personal experience as a staff officer assigned to both the United States Strategic Command and later, the NNSA.
[70] Taken from NNSA working papers
[71] NNSA working papers
[72] Picture taken from NNSA files.
[73] Picture taken from NNSA files.
[74] NNSA working papers
[75] Taken from working files of NNSA staff members.

Chapter IV

Conclusions: The Path Forward

The next chapter of this work will draw some conclusions from the lessons learned as depicted in the previous chapters and will provide some thoughts in establishing a 21st Century nuclear stockpile and an effective nuclear deterrence policy.

Many Americans today view the Cold War as synonymous with nuclear deterrence. Some modern thinkers on the subject of nuclear deterrence, however, correct this notion by stating that nuclear weapons in themselves do not represent deterrence, rather "nuclear weapons play an essential role within a credible deterrence strategy."[76] These modern-day deterrence advocates make a sound case for inclusion of defensive measures as well as offensive measures to formulate a new deterrence strategy. With time, they further assert that "the new logic shifts deterrence strategy away from mutual vulnerability and high numbers of offensive nuclear weapons toward a strategy based on protection and assurance, and much lower numbers of nuclear weapons."[77]

Regardless of how a discussion on new nuclear deterrence policy turns out, the United States cannot afford to lull itself into a sense of security from WMD threats. In *Transforming Nuclear Deterrence*, Dr. Barry Blechman, Chairman of the Henry L. Stimson Center, states,

> "Recent attempts by various U.S. officials to define explicitly a role for nuclear weapons in deterring CBW are also counterproductive. The formal adoption of any such role would not only fail to accomplish its stated goal, but could permit us to convince ourselves that we do not have to take the much harder step that are necessary to deal with chemical and biological threats through conventional means."[78]

Blechman goes on to paint a bleak picture of deterring non-state actors when he writes, "Although the possibility of a terrorist attack employing chemical or biological weapons exists, only their threatened use by national actors are deterrable."[79] But although non-state actors may not be deterrable in the classical sense, the Bush administration has signaled that it will hold states accountable for providing safe haven to terrorist groups. This policy may provide a deterrent value against non-state actors through indirect pressure from their host states.

As discussed earlier, it is useful to perform military planning against two important scenarios; the most dangerous and the most likely scenarios. During the Cold War, many would consider these threat scenarios to be nearly identical, or at least very closely pointing to the same threat – the Soviet Union. Today's geopolitical circumstances, however, have changed dramatically to the point where the most dangerous threat may still remain a large-scale nuclear strike from Russia, but the case for the most likely threat is different. Indeed, the world is filled with proliferation of WMD and delivery means on an increasingly sophisticated and ubiquitous degree. After the attacks on the United States of September 11, 2001, the most likely future scenario has shifted to asymmetric attacks against the US by non-state actors. Building a credible nuclear deterrence strategy against these two threat scenarios must be approached in similar fashion to previous deterrence strategies. The United States must present the capability to act against potential aggressors and the credibility that it will do so if provoked.

US capabilities must include the offensive capabilities to inflict unacceptable levels of damage upon an aggressor by targeting his highly valued areas of interest. Against the most likely threats cited early, non-state actors using WMD, these capabilities must be considered using all elements of national power, including nuclear weapons. US capabilities must also be displayed through active and passive defenses to deny the aggressor from the ability to achieve his aims. US

credibility must be supported by consistent government action across both the executive branch and legislative branch. The US notion of ambiguity of intent still has a role in deterrence, however, internal US policy must plan and exercise the full range of responses should the need arise. Too often in the past, ambiguity has actually been poor planning and refusal to think about the unthinkable. Nuclear weapons cannot remain a forbidden subject of discussion in strategic deterrence unless the US desires to remain self-deterred and vulnerable.

Chapter III of this paper enumerated several inhibitors to the maintenance of the US nuclear deterrent and each of these must be addressed in order to construct a new deterrent capability: treaties; definition of US adversaries; US capabilities, including revitalization of the nuclear weapons complex; and US credibility. Additionally, as nuclear weapons are moved from being the US strategic deterrent in and of themselves, these weapons must be placed as important elements of a broader strategic deterrence capability that includes defenses, infrastructure, and conventional weapons.

Path Forward - Treaties

US diplomatic efforts must continue to stem proliferation of WMD technologies, materials, and delivery systems. The NPT remains a cornerstone document in the effort to stem nuclear weapon proliferation and these efforts must continue. Countries that are signatories to the NPT yet show clear intentions and capabilities, contrary to their agreements, must be confronted by the international community. Other countries that remain aloof from the restrictions of the NPT should be diplomatically engaged to encourage their participation in the NPT. Iran, Iraq, Libya, and North Korea are examples of the first case while India, Pakistan, and Israel are examples of the second.

Regarding the CTBT, some claim that its ratification is a strong element of US nonproliferation efforts and should be immediately accepted by the Senate. Others state that a CTBT has dubious connection to nonproliferation efforts.[80] Countries seeking nuclear weapons can build crude devices without the need to test according to scientists in the NNSA. They argue that a CTBT has no correlation with the motivation to seek nuclear weapons. If one accepts, however, that support of a CTBT remains US policy, the United States should seek approval of a test ban that is only as restrictive as verifiably possible. A true zero-yield nuclear test ban prevents US scientists from conducting important nuclear weapon confidence tests and experiments that are needed to validate state-of-the-art computer codes. These codes are needed to model US warheads to predict problems and performance concerns, assess warhead viability, assess the impact of warhead modifications subsequent to repairs, and predict performance of possible new warhead and delivery vehicle designs. Although a nuclear test ban treaty would prevent US scientists from gaining new knowledge and fully validating codes at significant warhead yield levels, it likewise would prevent other states from similar benefits. The US has more to gain by limiting world-wide nuclear testing and proliferation than it does by continuing full yield nuclear testing – thus supporting the idea of a CTBT at verifiable levels. The problem arises, however, in treaty verifiability. A low-yield nuclear explosion in underground facilities may be impossible to detect. Therefore, while US scientists are hamstrung and concerned about the veracity of new codes without sufficient benchmark data, some nations that have signed the CTBT may be developing new weapons without detection. The NNSA should therefore be directed to reassess the CTBT and should support the lowest verifiable test limit possible. Furthermore, the current US testing moratorium should be modified from the present zero-yield limitation to the limitation presented by the NNSA/National position. Such a policy will provide beneficial low-yield nuclear test data

to the United States while limiting the possible benefit to test ban treaty signatories that are avoiding detection of nuclear weapon testing.

Path Forward – Define the Enemy

A second impediment to a deterrence strategy is the mindset that the United States may fight against aggressor regimes and governments, but not the populace of the state. This impediment appears to be a relatively recent phenomenon and may prove counterproductive in certain circumstances. President George W. Bush, in his speeches regarding the war on terrorism, has consistently maintained that states that support terrorism are to be held accountable to the same extent as the terrorists they harbor.[81] He has held to the notion that a state has responsibility over the terrorist activities within the state. Similarly, it is quite conceivable that a nation's populace should be held accountable for the policies and practices of its government. In other words, the populace of a state has responsibility to support righteous policies while resisting evil policies. Should a state populace prove complicit in atrocities and criminal actions performed by the state, the populace itself may in fact be an appropriate target. Dror, in his work *Crazy States*, argues that everyone does not necessarily desire the US model of life. Although many adversary state regimes may not be democratic, the will of the populace at large may well support the non-US state structure and should be held accountable for its criminal activities where such occur.[82] In such an instance, nuclear weapons are very appropriate to destroy large area targets that are relatively unprotected by either hardened facilities or natural terrain impediments. This paper makes no assertion that a state exists today that fits this description of a complicit populace, however, policymakers must refrain from denying this possibility.

US policymakers must continue to identify specific leaders, governments, and policies that are indeed criminal, corrupt, and appropriate for targeting. However, these policymakers must also call the population of the state to task for its support of the government. The population of a state must be held accountable for its role in state behavior. Thus, the F-111 raids into Libya in 1986

targeted Libyan Leadership. The attacks against Manuel Noriega targeted the police and leadership of Panama in 1989. The attacks against Iraq targeted the military forces and leadership of Saddam Hussein in 1991. And the attacks against Afghanistan targeted Al Qaeda terrorist facilities and leaders and Taliban government leaders in 2001-2002. In each case, US policymakers identified the specific leader, group of leaders, or government organizations that were responsible for violence against US and international interests. Tomorrow's conflict may well be against the people of country X that must be held accountable for their complicity in their state's illegal violence against US and international interests.

One can argue that US conventional military superiority makes nuclear weapons unnecessary against adversaries. There is no other weapon, however, that can provide retribution and destruction upon an adversary in short order. Use of nuclear weapons keeps US troops out of harm's way while inflicting devastating damage upon the adversary. Nuclear weapons may also be the appropriate weapon against deeply buried targets. Many countries are moving WMD facilities and command and control nodes into hard-to-reach underground facilities that conventional munitions simply cannot reach. In these cases, nuclear weapons provide one of only a few viable options to destroy these important targets.

The US can target adversary population centers in other less lethal ways such as destabilizing their domestic political situation,[83] or targeting specific domestic vulnerabilities that may well attain the strategic goals through indirect methods. The United States must recognize states that are moving toward escalating levels of aggression while they are still early in their political regimes.[84] This point was missed in years past regarding Nazi-Germany for instance, because the world lacked a framework upon which to analyze the threat. Indicators were present, but a

perceptive framework did not exist to identify Germany's movement toward "craziness" as it committed the Holocaust against the Jews.

Once a state is on a clear path toward aggression, US efforts should be aimed at preventing the state from developing the capability to act out its aggression outwardly. These efforts may include using economic support to US-friendly government leaders, military assistance, political transformation, or other element of US national power. Any US action, however, must avoid encouraging aggressive state behavior by rewarding its unacceptable activities and further encouraging more of the same.[85]

Discussing the strategy of deterrence, one must assume that adversaries possess some sense of rationality, albeit much different from Western rationality. In other words, non-state actors must perform some type of cost-benefit analysis to justify their actions to themselves and their followers. This justification may be martyrdom in heaven with Allah when they die for their cause. It is not necessary that the rational actor be rational in Western eyes, but only that he perform some cost-benefit analysis to which deterrence may have an impact. US strategists must determine the source of the non-state actor's benefits and their highly regarded values so that they can be undermined in US actions.[86]

The Path Forward - US Capabilities

A third inhibition to a strong US strategic deterrent is the decline in confidence in the reliability of the US nuclear stockpile. As discussed in Chapter III, the annual certification letters from the DoD and DOE have become increasingly contentious, as every word and sentence is carefully crafted to tell the President that there are growing concerns but that the stockpile remains healthy, able to meet all military requirements. [87] Concerns over the reliability of the nuclear stockpile serve to further self-deter the US, as any failure places the entire deterrent into question.

The path forward to address concerns over the reliability of the US nuclear stockpile requires action with respect to people and infrastructure.

Each year the nuclear laboratories report their reliability calculations for each warhead in the nuclear stockpile. These assessments are reported to facilitate United States Strategic Command war planning and expected damage assessments against targets. These figures are not statistically calculated each year but rely upon nuclear scientists' interpretation of nuclear warhead surveillance data. Scientists review previous years' data and new surveillance data to predict warhead reliability. This system is highly dependent upon the quality of the scientists, most of who are now above the age of 50. With college recruitment becoming more difficult, NNSA is grappling with how to attract and retain today's young scientists for the judgement they will require in 20 years.

Correcting these personnel problems in the nuclear laboratories revolves around the premise that our nation's talented people want to do meaningful work that provides stability and professional growth over a lifetime. The national laboratories at Los Alamos, Lawrence Livermore, and Sandia must be put to work on real weapons. This point was well articulated by the Foster Panel, a Congressionally mandated panel of distinguished nuclear weapons experts, when it filed its most recent report in 2001. The Panel called for a "national commitment to a robust program of hands-on innovative work."[88] Young scientists do not want to spend a career working on nuclear weapon systems that cannot be tested and therefore cannot be modernized. These scientists require experience in demanding engineering and physics areas to develop the scientific judgement needed to maintain the nuclear stockpile into the coming decades. One way to partially address this issue is to put these scientists and engineering and physics tools to work on problems that can be tested and solved experimentally – namely, design and development of

conventional precision weapons tailored to the strategic missions of the new century. Although the skills sets for conventional and nuclear scientists are not identical, this is one way to attract scientist to real work while exposing them to the challenges of nuclear weapon science and whetting their appetite for a career in the national laboratory system. Attacks against rogue states or against weapon caches of non-state actors will require precision strikes to minimize collateral damage, yet sufficiently lethal to destroy the target and the WMD hazards. The nuclear laboratories have advanced computational and experimental facilities and scientists that can apply nuclear warhead assessment tools to conventional weapons effects. In fact, these scientists are among the best equipped in the world to understand how to defeat the WMD threats and hazards that are likely to face the US as the international war on terrorism matures. Work on precision conventional weapons specifically designed to defeat strategic threats would provide much needed experience and confidence in both the new nuclear laboratory experimental tools as well as the scientists that interpret the data attained. The NNSA Stockpile Stewardship Program is perfectly suited to expand its application to these other important issues of national security while simultaneously providing the real-world mission and challenge that will help attract and retain America's best talent to national defense. Once in the national laboratory system, many of these young scientists will be exposed to the unprecedented challenges that stockpile stewardship entails and will likely be retained in the laboratories in both nuclear and conventional weapon areas.

Another area involving US nuclear weapon scientist that is ripe for improvement is within the NNSA Stockpile Stewardship Program. Over the next 10 years, over half of the US nuclear stockpile is scheduled for refurbishment – that is rebuilding/replacing parts of the nuclear warhead to extend its life for the next 20-30 years.[89] The term "refurbishment" has been used as a leftover from the Clinton Administration to stay away from the perception that the laboratories are

building new weapons – a definite career ending perception in the previous administration. Although there is no legal prohibition against building new warheads (except for warheads with yields below 5 kilotons) [90], the DoD and NNSA have been reluctant to sanction such efforts without a documented military requirement for a new capability. The DoD has not been willing to document the need for a new weapon because of the politics involved. In 1997 the last "new" weapon to be designed and fielded, the B61-11 (or B-61, mod 11), replaced the old behemoth B-53, the warhead with the largest yield that was targeted at hardened underground targets that could not be destroyed with smaller warheads. [91] Safety and reliability concerns provided sufficient motivation for both DoD and DOE to push for the B-53's retirement, once the B61-11 was operational. Sporting a new hardened outer case, the B61-11 employs the same nuclear inner parts as the other strategic B61-7 model but is capable of penetrating the earth to achieve nuclear effects similar to the much larger B-53. [92] Lastly, the B61-11 is a perfect example of how scientists used existing warhead components with a strong nuclear-test pedigree to field a new capability not requiring underground nuclear testing to verify operational performance.

Reenergize the Complex – Weapons of Limited Destruction

The NNSA nuclear laboratories should be authorized, in fact, be formally tasked, to provide low-risk options for new warhead designs to meet specific target requirements in the post Cold War era. Such work would reenergize an anemic weapons design and development program and provide the real-world work that will develop in our scientists the technical judgement needed for tomorrow. The nuclear laboratories have numerous studies and options to begin a new development program on short notice and should be authorized to do so to meet specific targeting requirements that cannot be acceptably attacked and destroyed using current conventional or

nuclear weapons. Senior NNSA officials consider taskings like the call for new weapons designs as deterrent factors in themselves.

One very recent example of a new tasking for the NNSA is the program known as the RNEP, or the Robust Nuclear Earth Penetrator. This program goes a step beyond the fielded B61-11 earth penetrator by exploring a host of options to reach harder and more deeply buried targets than reachable by the B61-11. NNSA officials have commented that the national debate and public awareness of the RNEP program is providing a measure of deterrence that has been missing for the last 10 years. The fact that the United States is discussing new uses for nuclear weapons that are germane to the issues of the day in Iraq and other rogue nations on the axis of evil, signals to our potential adversaries that the US remain committed to its nuclear forces. The ambiguity of US nuclear weapon use is stronger with the increased potential that weapons like the RNEP will provide. Similarly, other programs that allow the NNSA laboratories to design, perform limited tests, and field special use nuclear weapons will have a similar deterrent affect. In fact, the recent leaking of several details of the classified Nuclear Posture Review in the Los Angeles Times was barely noted by senior DoD officials and actually provides fodder for lively national debate on the entire issue of nuclear deterrence.[93] And all along, the nations of the world, potential adversaries and friends, are paying careful attention – another example of advertising US capabilities to provide true deterrence.

The state of the national infrastructure to maintain US nuclear deterrence capabilities is worse than the personnel issues. Over the past 12 years, the NNSA has closed 3 major installations and curtailed operations in several others including the Nevada Test Site, reducing the footprint of the nuclear weapons complex by almost 50%.[94] Because of the age of the current stockpile, most warheads are beyond their expected life, and spare parts are either in short supply or supplies are

completely exhausted. Additionally, many of these parts were manufactured using sunset technologies by companies that either do not produce them anymore or are now out of business. Finally, due to chronic under-funding over the last decade, many of the existing facilities within the nuclear weapon complex are in serious need of renovation or replacement.

The scientists and administrators of the NNSA are well aware of the issues and problems associated with the nuclear weapon production complex and experimental facilities. After making some strategic decisions regarding the composition of the nuclear weapon stockpile, full and stable funding must be provided for the NNSA budget, using its five-year budget plan. DoD's recent nuclear posture review recommended a new triad consisting of robust nuclear and conventional forces, active and passive defenses, and a responsive infrastructure.[95] Stable funding and several up-front decisions regarding stockpile size and composition will certainly be necessary to provide the responsive infrastructure that the new triad necessitates.

As mentioned earlier, the threats of the future will likely begin in regional contexts. These regional powers will continue to seek missile capabilities not to necessarily challenge the US, but to provide regional deterrence against enemy states in the same geographic area. Should the United States chose to become involved in a regional conflict, these same regional enemies may attempt to threaten US troops, allies, or US territory that can be reached by their missiles. Thus, missile defenses will serve a useful role although they will encourage smaller state and non-state actors to perhaps accelerate acquisition of innovative means to get around US defenses.

The US National Laboratories have been looking ahead at how existing warheads can be modified to produce more accurate weapons with lower nuclear yields, thus providing strike options currently not possible. For instance, if a biological weapon plant was detected in a state with hostile intent toward the United States, conventional preemptive attacks might spread the

toxin and cause horrific collateral damage. For this situation a very precise low-yield nuclear warhead with some penetrating capability would be capable of entering within a few meters of the target, while raising the temperature of the facility to sufficient levels to kill any toxins in the area of the fireball. With the toxin destroyed, there would be significantly less collateral damage. This gives the President options that are not available with conventional weapons at this time.

Additionally, such modifications provide new military capabilities without significantly changing the Nuclear Explosive package (NEP). The NEP consists of the nuclear trigger and secondary stages of a nuclear warhead normally produced from uranium and/or plutonium. The Los Alamos and Lawrence Livermore laboratories are extremely reluctant to make any change to the NEP that cannot be certified for use without an underground nuclear test.

In the case of the B61 modification that provided earth-penetrating capability (B61-11), Los Alamos and Sandia worked together to successfully mate the existing NEP with the newly designed Sandia components to provide a new and safer option to attack hard-to-kill targets. Los Alamos scientists were very careful to ensure that B61-11 operation would fall within the testing pedigree established during the era of underground nuclear testing. [96]

One key element of the NNSA nuclear weapons complex is the Nevada Test Site. As discussed earlier this site remains in standby mode, with mandated recall to be nuclear test capable within 24-36 months. In actuality, the NTS will take the full 36 months to conduct a fully instrumented nuclear test. [97] It is difficult to imagine that the United States could afford to wait 36 months to test a nuclear device, should its operational capabilities be called into question. NTS readiness must be reassessed and fully exercised at intervals consistent with realistic national security needs. The sub-critical testing program currently underway within existing mine shafts should continue, as it exercises many of the required nuclear test functions.

Another aspect of US capabilities includes the use of appropriate defenses to protect US interests from attack. Critics against defenses abound. Charles Glaser asserts that a world in which the United States has perfect or near-perfect defenses is less secure than living under MAD.[98] Although Glaser's argument applies to a bipolar world with the Soviet Union, the principles can be applied to today's environment of smaller regional actors and non-state actors. Perfect or near-perfect defenses, similar to those in the proposed missile defense system, have two predominant shortfalls. First, these defenses will not stay perfect, and second, they encourage an opponent to seek innovative ways around the defense through technological advances or through delivery means that remain undefended against. We may assume that for the small state or non-state aggressor, US defenses will remain sufficiently perfect to destroy the small number of missiles that may attempt to land on US territory before they can pose a threat of high-casualties. For the second case, however, perfect missile defenses would not be able to stop a clandestine innovative attack, such as a ship with WMD entering a US harbor near a major city. Perfect defenses actually serve as incentives for actors to find these innovative attack methods to avoid US strengths. Additionally, these low-technology innovative attack options can be acquired more quickly and are also much less difficult to acquire and less costly than ballistic missile technologies. Although the attainment of perfect missile defense will not stop low-technology attacks, it will likely stop ballistic missile attacks. And because an adversary is capable of using low-tech options, regardless of whether the US has ABM defenses or not, it remains advantageous for the US to possess ABM defenses for those countries that do seek ballistic missiles.

The use of defenses is also necessary to allow the US to project military power into regional conflicts. As stated earlier in this paper, regional adversaries are likely to raise the cost of US intervention in regional contexts to the point that US policymakers will back down, fearing

casualties and loss of US popular support. Regional defenses that provide protection to deployed military forces and American allies will greatly reduce the capability of an adversary to meet its goals through the use of WMD. In such a case, the probability of WMD use is diminished, as the adversary may fear the probable retaliation from first-use of WMD.

The Path Forward - US Credibility

The second part of a deterrent strategy centers on credibility. Aggressors must know that the United States will use its military force, including nuclear weapons, to back its interests and values. The United States will assure that its deterrence strategy remains credible and hence intact, by overtly targeting high value areas of potential state and non-state actors, consistently vocalizing US policy, and including conventional weapons in the strategic deterrent.

During the 1962 Cuban Missile Crises, the Soviet representative to the UN was publicly embarrassed when the United States presented photographs of Russian missile sites in the final stages of construction.[99] With the entire world aware of its hostile acts, the Soviets had no way to garner support for its open hostility to US demands to back off from the brink of war. Today, US intelligence sources have reams of data showing clear signs of WMD proliferation among countries that have signed nonproliferation treaties and agreements. The United States must take the initiative and expose these intelligence findings as evidence that rogue states are either directly supporting WMD proliferation or are providing safe haven for non-state groups with similar intentions. Nodal analysis tools may be used to find and target critical nodes in WMD proliferation and to dismantle aggressor actor capabilities. These targets must be considered high value targets, as they directly incapacitate the aggressor's offensive capabilities.

In addition to affecting aggressor capabilities, US planners should also target high value areas for a particular threat. This action requires unparalleled integration between intelligence

collection agencies, DoD, and other agencies with special expertise, such as the Center for Disease Control. The government response in dealing with WMD aggressors must be a coordinated effort using all possible avenues to address the threat. An effective US effort against proliferating aggressors must incorporate all elements of US power, including public diplomacy, use of international organizations, economics, intelligence, arms control, defense peacetime engagements, security relationships and overseas presence, humanitarian operations, unconventional military operations, limited military intervention, and classical military operations.[100]

The US record in pulling these disparate elements together into a coherent national strategy, however, is spotty at best. Too many instances have pointed out the unnecessary compartmentalization of information even within the Executive Branch of the government, with the September 11th incidents as the most painful recent example. In that case, CIA files listing suspects of known terrorist organizations were not available to the Maryland State Trooper who pulled over one of the jet hijackers a few days before the suicide mission or to the State Department representatives who granted visas to incoming Islamic terrorists. [101] Clearly the Bush Administration must task a lead agency to develop a coherent national security program.

Along with establishing a coherent US national security response using all elements of national power, the US must speak with one voice as it conducts its affairs of state. Tightly coupled to coherent US policy is the idea that diplomats, other high-ranking government officials, and US policymakers must each be aware of US policy and must understand and vocalize the contribution that their own organizations play toward the overall accomplishment of national security. Without a doubt, when US power is properly focused on national security issues, US credibility is increased. Once articulated, the US must back up its policy unequivocally. Military

and non-military operations must be fully endorsed by the President and allowed to bring the full weight of the US government against aggressors. The disastrous policies of the Vietnam war remain transfixed in the minds of military leaders. And more recent events like the Kosovo air campaign indicate that White House micro-management with military affairs is far from a thing of the past. The Clinton Administration, in a throwback to Vietnam, insisted that all targets be approved by the President, opening the door for other nations to do likewise.[102] Additionally, air operations were gradually increased in tempo to attempt to bring Slobodan Milosevic to his knees. These tactics cost lives and credibility, as key targets against the Serbian center of gravity could not decisively be attacked. Other time-critical targets were moved by the time approval was received, and thousands of Albanian Kosovars were killed in ethnic cleansing while US power was incrementally increased. While the use of military force is always subjugated to political will,[103] the military must have the freedom to conduct operations with minimal White House intervention. US civilian leadership must trust and understand military doctrine or risk the inappropriate use of US military force. The Bush administration will face a crossroads as it remains to be seen whether the Bush team will indeed make the fight on terrorism, "the focus of this Administration."[104]

Some might argue that a more credible US posture could increase possible use of CBW because leaders of adversary countries would pre-delegate release authority to lower levels of command. According to Scott Sagan, a well-known critic of US nuclear policy, adversaries concerned about the US decapitation of a state's command and control will pre-delegate to lower-level officers the authority and capability to strike back in that case.[105] Thus, the decision to use WMD will reside with these lower level officers, who are considered harder to deter than a national leader. Gulf War reports of nuclear detonations by military personnel were actually

incidents involving conventional munitions. However, the extraordinarily large explosions caused personnel to misinterpret the US munitions that were used. Such errors, if committed by the adversary, could lead to disastrous effects. Sagan asserts that US nuclear threats work counterproductively in arms control goals as well as WMD proliferation[106] and may actually serve to back a President into a corner. Should the US President explicitly promise to attack adversaries with nuclear weapons in response to WMD attacks against the US, the argument maintains that in order to maintain US credibility, a President will be pushed into a potentially bad decision to protect future credibility. Sagan's argument does not hold up historically or in this author's experience regarding the perceptions of foreign military officers. First, Sagan admits that the threat of nuclear weapons did deter Iraq from using chemical weapons in 1991.[107] And although this threat was not verbalized, the movement of B-52 aircraft into the theater of operations was verbal enough to make the point. There is no evidence that nuclear threats during the Gulf War, the Berlin Crisis, or the de-escalation of the Korean War ever served to embolden adversary state leaders to test US resolve. In fact, this author's conversations with international officers at the Air War College indicate that American foreign policy and actions in conflict appear to them as inconsistent and unpredictable. Just as Americans seem to miscalculate the actions of other nations because we are stuck in the US Western way of perceiving events, these foreign countries cannot accurately predict when the US will go to war and when it will not. Accordingly, US nonuse of nuclear weapons, even after reiterating threats of use, does not make it any easier for an adversary, that does not fully appreciate US interests and ideology, to be able to discern a change in US resolve to use nuclear weapons in the future.

Finally, although this argument appears to support the American policy of ambiguity in nuclear weapon use, the reader will recall that too often, US ambiguity is not purposeful but is a

result of unclear policy, poor planning, and leadership failure to consider the "unthinkable." As discussed earlier, strategic surprises perpetrated against the US should be viewed as failures in US strategic planning. Simply stated, US leaders must think about the "unthinkable" to appropriately craft policy and strategic decisions.

The third area impacting credibility of US deterrence policy is the inclusion of conventional weapons in the strategic deterrent. Nuclear weapons have increasingly become unusable weapons, with the only two attacks against Japan in 1945. With over 55 years of nonuse, the credibility of nuclear strikes grows dimmer with each passing crisis. Recent examples, like the B-52 movements to Diego Garcia and verbal warnings to Saddam Hussein that his use of chemical or biological weapons against US troops would incur the most devastating response, have been muted by revelations that the US never had the intent of using nuclear retaliatory strikes. A US deterrence strategy then, resting solely on nuclear weapons, is destined to become less viable and credible as one crisis after another points to a non-verbalized policy of "no first use." Additionally, US conventional weapons have evolved from dumb to smart to brilliant over the past 15 years or so.[108] Today's pinpoint accuracy and improved munitions drastically increase the type of targets that can adequately be destroyed using conventional means. A new US deterrence strategy must include all legal weapons appropriately applied against the right targets. In the Cold War, the terms "strategic weapons" and "deterrence" were shorthand for nuclear weapons. Today, however, a broader deterrence strategy must protect against the most dangerous threat against the US and the most likely threat – two very different threats. Just as nuclear weapons must be considered appropriate weapons for certain targets and situations, so a strategic deterrence must include conventional weapons that may have strategic effects. A conventional weapon that destroys a chemical production facility, sparing the US a major chemical attack, is a strategic

preemptive strike. So conventional weapons can be strategic if their effects have strategic impact. A comprehensive strategic deterrent will consider all the elements of national power in determining how to execute a national strategic deterrence policy.

The path forward then for the United States is promising. Nuclear weapons provide capabilities that no other weapon can match. Each of the inhibitors to establishing a credible nuclear deterrent is surmountable provided the nation's leaders step up to the challenge and think the unthinkable. There are appropriate cases in which nuclear weapons are the weapon of choice and this country must establish a clear framework upon which decision can be made regarding the deterrent value or employment of these weapons.

Notes

[76] Cappello, Hall, and Lambert, 453.
[77] Ibid., 21.
[78] Robert Joseph and Barry Blechman, "Deterring Chemical and Biological Weapons," *Transforming Nuclear Deterrence*, National Defense University Press, 1997, p. 13.
[79] Ibid., 14.
[80] Private Communications with high-ranking NNSA officials, 12 April 2002.
[81] George W. Bush, State of the Union address, January 2002.
[82] Dror, 14.
[83] Ibid., 10.
[84] Ibid., 76.
[85] Argument summarized from Dror, *Crazy States*.
[86] Ibid., 83.
[87] NNSA working papers, 2002.
[88] Foster Panel Report to Congress, 12.
[89] NNSA working papers
[90] Public Law 103-160, Section 3136.
[91] US Strategic Command working papers, 1997.
[92] Private Communications with scientists of Sandia and Los Alamos National Laboratories, 2001.
[93] William M. Arkin, "Nuclear Warfare; Secret Plan Outlines the Unthinkable," Los Angeles Times, Mar 10, 2002.
[94] Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management, DOE/EIS-0236, US Department of Energy, September 1996.
[95] NNSA working paper regarding the Nuclear Posture Review, 2002.
[96]Private Communications with scientists of Los Alamos National Laboratory, 2001.
[97] Private Communications with NNSA staff, 2001 and U.S. Department of Energy, *Stockpile Stewardship Program*, 30-Day Review, November 23, 1999, p. 2-8, p. 6-4.
[98] Discussion from Charles L. Glaser, *Analyzing Strategic Nuclear Policy*, Princeton University Press, Princeton, NJ, 1990.
[99] www.historychannel.com/cgi-bin/frameit.cgi?p=http%3A//www.historychannel.com/speeches/archive/speech_290.html
[100]*Strategic Assessment 1996*, *Instruments of U.S. Power*, Institute for National Strategic Studies, National Defense University, Wash. D.C., 1996.
[101]Del Quentin Wilber, Caitlin Francke and Michael James, "Md. Caught a Hijacker Speeding Days Earlier; O'Malley Cites Case as Law Enforcement Failure to Share Data," The Baltimore Sun, Dec 12, 2001.
[102] Wesley K. Clark, *Modern War*, PublicAffairs, New York, N.Y. 2001.

Notes

[103] Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 87.
[104] Telephone conversation between President George W. Bush and Governor Pataki and Mayor Giuliani, September 13, 2001, www.whitehouse.gov/news/releases/2001/09/20010913-4.html.
[105] *The New Terror*, 430.
[106] Ibid., 436.
[107] Ibid., 426.
[108]John Carey, Catherine Yang, Otis Port, and Christopher Palmeri, "From Smart to Brilliant Weapons," Business Week," issue 3752 (October 8, 2001): 62.

Chapter V

Recommendations

Armed with some lessons learned from the Cold War in which the US nuclear deterrence strategy helped keep the peace for over 50 years, this paper raises the call for a new nuclear deterrence strategy that will keep the peace for the next 50 years. First, this paper reviewed the likely future strategic environment in terms of both trends and specific threats posed by countries large and small. Next, it brought to the forefront several factors that inhibit the formulation of a relevant nuclear deterrence strategy – factors that must be overcome. Finally, this paper described many specific ways that each of these inhibitors could be dealt with to craft a new nuclear deterrence strategy that will serve the US in this New World Disorder. This final section of the paper will succinctly recap the major recommendations presented in Chapter IV for ease of reference.

The Cold War nuclear deterrence strategies served to protect the US from both the most dangerous and most likely enemy courses of action, both of which emanated from the Soviet Union. The US faces a more uncertain future than ever before - a future in which the most dangerous and most likely enemy courses of action no longer lead to the same potential adversary. Instead, any US nuclear deterrence strategy must protect against a resurgent Russia, still armed with over 20,000 nuclear warheads, and the most likely enemy course of action in asymmetric attack from regional state or non-state actors. Though these scenarios are indeed very different,

the US must protect against both simultaneously. It is not time to push nuclear deterrence aside. Today, more than ever, maintenance of a national nuclear deterrent should remain a cornerstone of US national defense policy into the foreseeable future. The formulation of this deterrent must be shaped by the recognition of an entirely new geopolitical environment, a national determination to overcome inhibitions regarding the use of nuclear weapons, and a renewed commitment to build the deterrent to meet tomorrow's requirements and not those of yesterday. US capabilities must include the offensive capabilities to inflict unacceptable levels of damage upon an aggressor by targeting his highly valued areas of interest. Against the most likely threats cited earlier, non-state actors using WMD, these capabilities must be considered using all elements of national power, including nuclear weapons. US capabilities must also be displayed through active and passive defenses to deny the aggressor from the ability to achieve his aims. US credibility must be supported by consistent government action across both the executive branch and legislative branch. The US notion of ambiguity of intent still has a role in deterrence, however, internal US policy must plan and exercise the full range of responses should the need arise. Too often in the past, ambiguity has actually been poor planning and refusal to think about the unthinkable. Nuclear weapons cannot remain a forbidden subject of discussion in strategic deterrence unless the US desires to remain self-deterred and vulnerable.

In order for the United States to maintain both a credible deterrent and deterrence strategy it must:

- The President should publicly release new guidelines for possible use of US nuclear weapons including: US preemption/response to WMD attacks against US citizens, forces, and territories; use against special targets that cannot be held at risk using conventional forces such as hard and deeply buried targets (command and control

bunkers, WMD-related facilities, etc); and US preemption/retaliation against targets that require destruction in very short order.

- The President and Cabinet should hold periodic high-level command exercises to rehearse realistic scenarios leading to possible nuclear weapon employment
- Establish active and passive defenses to thwart WMD use against the US
- Engage potential adversaries through a coordinated total government approach using all elements of national power - diplomacy, economic means, and other elements of US national power.
- Confront treaty violators (NPT, CWC, BWC, etc.) in international fora
- Seek a Nuclear Test Ban Treaty at the lowest verifiable levels of yield
- Encourage populations of potential adversary states to avoid complicity in their governments' hostile activities – hold these populations accountable where appropriate
- Take preemptive actions against rogue states to deny them WMD capabilities
- Broaden the charter of US nuclear labs to leverage their technologies and expertise through design and testing of strategic conventional weapons
- Task the NNSA to develop a series of low-risk options for new warhead designs to meet emerging threats such as the RNEP.
- Reinvigorate the DOE/NNSA nuclear weapons complex by fully funding the Stockpile Stewardship Program and its associated infrastructure
- Review Nevada Test Site readiness and align its status with national security requirements. Perform high-fidelity nuclear test simulations to exercise all required skills.

- Continue to develop ballistic missile defenses for both protection of deployed US troops and the US homeland
- Demand a new level of integration of all elements of US national power to thwart WMD coercion against US interests