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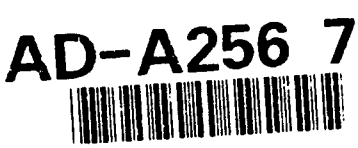

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THESIS

Non-Nuclear Deterrence in U.S. Strategic Policy:
Incentives and Limitations
by
Joseph J. Valenzuela
JUNE 1992

Thesis Advisor: David S. Yost

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92-28648

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS Unclassified
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/ AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION Naval Postgraduate School 6b. OFFICE SYMBOL *(If Applicable)* 38	7a. NAME OF MONITORING ORGANIZATION Naval Postgraduate School
6c. ADDRESS *(city, state, and ZIP code)* Monterey, CA 93943-5000	7b. ADDRESS *(city, state, and ZIP code)* Monterey, CA 93943-5000
8a. NAME OF FUNDING/SPONSORING ORGANIZATION 6b. OFFICE SYMBOL *(If Applicable)*	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS *(city, state, and ZIP code)*	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.

11. TITLE *(Include Security Classification)*
Non-Nuclear Deterrence in U.S. Strategic Policy: Incentives and Limitations. (U)

12. PERSONAL AUTHOR(S)
Valenzuela, Joseph, J.

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT *(year, month,day)*	15. PAGE COUNT
Master's Thesis	FROM TO	1992 June 18	143

16. SUPPLEMENTARY NOTATION
The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

17. COSATI CODES			18. SUBJECT TERMS *(continue on reverse if necessary and identify by block number)*
FIELD	GROUP	SUBGROUP	Non-Nuclear Deterrence; Strategic Conventional Weapons; Advanced Conventional Weapons; Deterrence

19. ABSTRACT *(Continue on reverse if necessary and identify by block number)*

THE THESIS ARGUES THAT SIGNIFICANT INCENTIVES AND SUFFICIENT MEANS EXIST FOR THE UNITED STATES TO FURTHER DEVELOP ADVANCED CONVENTIONAL WEAPONS TO ACCOMPLISH MISSIONS PREVIOUSLY RESERVED FOR NUCLEAR WEAPONS ON BOTH THE TACTICAL AND STRATEGIC LEVELS OF WARFARE. THIS CONCLUSION IS BASED ON A SURVEY OF (A) APPARENT INCENTIVES FOR AN INCREASED RELIANCE ON ADVANCED EXTENDED-RANGE CONVENTIONAL WEAPONS, (B) POTENTIAL CAPABILITIES AND LIMITATIONS OF SUCH WEAPONS, AND (C) POSSIBLE STRATEGIC IMPLICATIONS OF A GREATER EMPHASIS ON SUCH WEAPONS. INCENTIVES EXAMINED INCLUDE (A) THE DELEGITIMIZATION OF NUCLEAR DETERRENCE, (B) ENVIRONMENTAL, TECHNICAL, AND SAFETY CONCERNS ASSOCIATED WITH NUCLEAR WEAPONS, (C) THE DECLINING CREDIBILITY OF THREATS TO USE NUCLEAR WEAPONS IN MILITARY OPERATIONS IN THE MORE PROBABLE STRATEGIC CONTINGENCIES IN THE FORESEEABLE FUTURE, AND (D) THE MORE CREDIBLE THREAT OF DISCRIMINATE ADVANCED CONVENTIONAL WEAPONS. CURRENTLY AVAILABLE WEAPONS TECHNOLOGY CAN BE DEVELOPED TO STRIKE A BROAD RANGE OF TARGETS PREVIOUSLY THOUGHT VULNERABLE ONLY TO NUCLEAR WEAPONS AT COSTS COMPETITIVE WITH NUCLEAR ARMS.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT [X] UNCLASSIFIED/UNLIMITED [ ] SAME AS RPT. [ ] DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL David S. Yost	22b. TELEPHONE (Include Area Code) (408) 646-2579 22c. OFFICE SYMBOL Code NS/YO

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted
All other editions are obsolete

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Non-Nuclear Deterrence in U.S. Strategic Policy:
Incentives and Limitations.

by

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Lieutenant, United States Navy
B.A., University of Texas at Austin, 1984

Submitted in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS IN NATIONAL SECURITY AFFAIRS

from the

NAVAL POSTGRADUATE SCHOOL
June 1992

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Approved by: [redacted]
David S. Yost, Thesis Advisor

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Paul N. Stockton, Second Reader

[redacted]
Thomas C. Bruneau, Chairman, Department of National Security Affairs

ABSTRACT

The thesis argues that significant incentives and sufficient means exist for the United States to further develop advanced conventional weapons to accomplish missions previously reserved for nuclear weapons on both the tactical and strategic levels of warfare. This conclusion is based on a survey of (a) apparent incentives for an increased reliance on advanced extended-range conventional weapons, (b) potential capabilities and limitations of such weapons, and (c) possible strategic implications of a greater emphasis on such weapons. Incentives examined include (a) the delegitimization of nuclear deterrence, (b) environmental, technical, and safety concerns associated with nuclear weapons, (c) the declining credibility of threats to use nuclear weapons in military operations in the more probable strategic contingencies in the foreseeable future, and (d) the more credible threat of discriminate advanced conventional weapons. Currently available weapons technology can be developed to strike a broad range of targets previously thought vulnerable only to nuclear weapons at costs competitive with nuclear arms.

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TABLE OF CONTENTS

I. INTRODUCTION 1

A. THESIS 2

B. DEFINITIONS 3

1. Strategic Conflict 3

2. Advanced Conventional Weapon 4

C. U.S. NUCLEAR REDUCTIONS INITIATIVES OF SEPTEMBER 1991 AND JANUARY 1992 6

D. SUMMARY 10

II. THE DELEGITIMIZATION OF NUCLEAR DETERRENCE 12

A. THE DECLINE IN CONFIDENCE AND U.S. DETERRENCE THEORY 13

B. THE CREDIBILITY GAP 21

1. The American Way of War. 22

2. The Morality of Nuclear Deterrence 25

a. The National Conference of Catholic Bishops 27

b. Critics of the National Conference of Catholic Bishops' Report 29

c. The Moral Dilemma and the American Way of War 30

C. NUCLEAR COERCION 33
D. ABSENCE OF U.S. ATTEMPTS OF COERCION 37
E. SUMMARY 45

III. TECHNICAL, ENVIRONMENTAL, AND SECURITY PROBLEMS ASSOCIATED WITH NUCLEAR WEAPONS 47
A. THE "NUCLEAR WINTER" EPISODE AND ENVIRONMENTAL AWARENESS 48
B. THE STATE OF U.S. NUCLEAR WEAPONS PRODUCTION FACILITIES 54
1. The Restart of the Savannah River Plant . . 57
2. Cleanup Requirements for DOE Nuclear Weapons Production Facilities 60
C. CONCERNS OVER THE SAFETY AND RELIABILITY OF CURRENT NUCLEAR WEAPONS 62
D. PROSPECTS FOR THE FUTURE 66
E. MILITARY LIABILITIES ASSOCIATED WITH NUCLEAR WEAPONS 69
F. SUMMARY 72

IV. THE STRATEGIC IMPLICATIONS OF ADVANCED CONVENTIONAL WEAPONS: THE EMERGING THREAT AND "CONVENTIONAL DETERRENCE" 76
A. THE TRADITIONAL SCENARIO 78
B. DETERRENCE THEORY 80
1. Extended Versus Direct Deterrence 83

2. Past Failures of Conventional Deterrence and So-Called "Nuclear Deterrence Successes" . . 88
3. Escalation Control 90
C. CONVENTIONAL DETERRENCE 92
D. SUMMARY 97

V. CAPABILITIES AND LIMITATIONS OF ADVANCED CONVENTIONAL WEAPONS 98
A. TECHNICAL FEASIBILITY 100
B. MILITARY FEASIBILITY 108
C. CONCEPTS OF USE AND DEVELOPMENT 113
D. SUMMARY 115

VI. ANALYSIS 117
A. UNCERTAINTY OVER THE FUTURE OF THE AMERICAN NUCLEAR ARSENAL 118
B. THE "REED REPORT" 122
C. STRATEGIC CONVENTIONAL WEAPONS 125
D. SUMMARY 127
E. RECOMMENDATIONS 129

VII. CONCLUSIONS 131
A. INCENTIVES FOR THE SUBSTITUTION OF ADVANCED CONVENTIONAL WEAPONS FOR NUCLEAR WEAPONS. . . . 131
B. CAPABILITIES OF ADVANCED CONVENTIONAL WEAPONS . 133
C. SUMMARY 134
INITIAL DISTRIBUTION LIST 135

I. INTRODUCTION

During the 40-plus years of the Cold War the military arsenals of the United States and the Soviet Union were aimed at each other for purposes of deterrence and coercion. The nuclear forces of the United States bore an important share of the responsibility to deter attack on the United States and its vital interests. U.S. nuclear forces were used not only to deter nuclear and non-nuclear attack on the United State. and its vital interests, but also to influence the decision-making of adversaries, as was the case in Korea and Berlin under President Eisenhower.

With the end of the Warsaw Pact and the disintegration of the Soviet Union some have questioned whether any realistic threats to the United States and its vital interest exist anymore. The shift from a bipolar to a multipolar world, however, has not eliminated all threats to the United States or its vital interest; the threats have simply become more diffuse. In such a changed world environment can the United States continue to rely so heavily on its nuclear arsenal to deter its potential enemies?

In the last decade of the Soviet/American confrontation some experts in the United States and the Soviet Union observed that advanced conventional weapons could potentially perform certain missions previously assigned to nuclear

weapons. Proponents of such a move perceived several benefits in the replacement of nuclear weapons by advanced conventional weapons in the areas of morality, damage limitation, escalation control, and war termination. If these advantages existed in the era of Soviet/American confrontation, clearly many of the same advantages would also apply in the new multipolar world. In light of changes in the types and scope of threats to the United States, two questions need to be addressed. Should the United States continue to develop advanced conventional weapons for missions previously assigned to nuclear weapons? Is a greater reliance on "conventional deterrence" possible?

A. THESIS

The thesis examined here is that significant incentives and sufficient means exist for the United States to further develop advanced conventional weapons to accomplish missions previously reserved for nuclear weapons both on the tactical and strategic levels of warfare. For the past forty-plus years the term *strategic* has been synonymous with *nuclear*. The following pages will show that strategic conflict can and will include advanced conventional weapons. The thesis will show that, because of the maturation of a number of key technologies, the substitution of advanced conventional weapons for many missions reserved for nuclear weapons is now both possible and desirable.

Before one can justify the cost associated with the research, development, and deployment of advanced conventional weapons, one must ask several salient questions:

-- Are there reasons for lessening American reliance on nuclear weapons? Are advanced conventional strategic capabilities desirable?
-- What are the probable consequences of non-nuclear strategic weapons on deterrence?
-- Are advanced conventional strategic capabilities feasible?

The thesis will, therefore, examine (a) apparent incentives for an increased reliance on advanced conventional weapons, (b) possible implications of such weapons, and (c) potential capabilities and limitations of such weapons.

B. DEFINITIONS

1. Strategic Conflict

The term "strategic conflict" has since 1945, in the United States and most other Western powers, been synonymous with nuclear conflict. According to Carl Builder,

> For some strategic conflict is defined by its scope: it means general *nuclear* war . . . For others, it is defined by its potential consequences - a war that could destroy entire societies. Still others associate strategic conflict with the use of particular weapons - those carrying nuclear explosives and having intercontinental range. . . . More helpful here may be Webster's definition of strategic conflict as warfare designed . . . to strike

an enemy at the sources of his military, economic or political power.[1]

Thus, Webster's definition of strategic conflict will be used for the purpose of this thesis.

2. Advanced Conventional Weapon

The term advanced conventional weapon applies to a complete weapon system based on technologies such as sensors, munitions, advanced information systems, communication systems, and missile defense. For the purposes of this thesis, however, advanced conventional weapon will refer to extended-range cruise missiles, ballistic missiles, and guided munitions of great precision, discrimination, and control, that possess a near-zero circular error probable (CEP)[2] and allow sufficient standoff capability to ensure a high degree of survivability for the launch platform. "Ideally, standoff means I can shoot you, but you can't shoot me. At a minimum, however, standoff should keep my multimillion-dollar airplane

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[1]*Webster's New Collegiate Dictionary*, (Springfield, MA: Merriam, 1981), 1141, in Carl Builder, *The Prospects and Implications of Non-nuclear Means for Strategic Conflict*, Adelphi Paper 200 (London: International Institute For Strategic Studies, 1985), 2. (Emphasis in original)

[2]Circular Error Probable (CEP) - the radius of the circle around the intended target within which there is a 50 percent probability that a weapon aimed at the target would land within.

and the pilot in it from getting bagged by a fifty-ruble gun."[3]

The Soviets would have probably equated the term advanced conventional weapon, as it is used in this thesis, with the term "high-accuracy weapons."[4] High-accuracy weapons were defined by the Soviets as those:

> in which the precision of determination of target coordinates, the time for reaction of weapons, and the quality of guidance permits destruction of a target on the first shot or launch with a probability not less than .6 in real time.[5]

Another Soviet description included "the principle of 'one shot (launch)-one hit.'"[6]

While improved accuracy is required, to fulfill the definition of advanced conventional weapon, there also must be sufficient destructive capability in the warhead to ensure a high probability of kill. This is accomplished through

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[3]Edgar Ulsamer, "Hard Call on Technology." *Air Force Magazine*, April 1986, 59, cited in Paul Kozemchak, "New Guidance for Nuclear and Nonnuclear Weapons," in Fred S. Hoffman, Albert Wohlstetter, and David S. Yost, eds., *Swords and Shields, NATO, The USSR, and New Choices for Long-Range Offense and Defense* (Lexington, MA: Lexington Books, D.C. Heath and Company, 1987), 268.

[4]Notra Trulock III, Kerry L. Hines,and Anne D. Herr, *Soviet Military Thought in Transition: Implications for the Long Term Military Competition* (Arlington, VA: Pacific-Sierra Research Corporation, May 1988), 35.

[5]Lt. General V.G. Reznichenko, *Taktika*, [Tactics-87] (Moscow: Voyenizadt, 1987), 23, in, Ibid.

[6]Colonel Dmitriy Belskiy, under "Observer's Opinion":"Weapons Trial on Live Testing Ground," *Sovetskaya Rossiya*, in Russian 21 March 1991 First Edition, 5, translated in *FBIS Daily Report- Soviet Union*, 27 March 1991, 4.

several technologies that already exist, or are on the foreseeable horizon (e.g., insensitive warheads, fuel air explosives [FAEs], shaped charges and cassette type warheads with various submunitions).

C. U.S. NUCLEAR REDUCTIONS INITIATIVES OF SEPTEMBER 1991 AND JANUARY 1992

The question whether advanced conventional weapons can replace and/or are needed to replace nuclear weapons has been made more important with the unilateral nuclear reductions that the United States has announced. If American nuclear weapons are going to be eliminated, how will the United States accomplish the missions that were assigned to those nuclear weapons that are being eliminated or withdrawn? Do we need to replace those weapons?

President Bush announced on 27 September 1991 that he intended to eliminate all ground-launched tactical nuclear weapons and to eliminate most tactical nuclear naval weapons. Furthermore, the President announced his decision to withdraw and store all nuclear Tomahawk Land Attack Missiles (TLAM-N). His decision effectively eliminated much of the tactical nuclear arsenal from the operational inventory.[7] How will the

[7]See President, Address. "Address to the Nation on Reducing United States and Soviet Nuclear Weapons," *The Weekly Compilation of Presidential Documents* (30 September 1991) vol. 27, no.39, 1348-1351.

missions previously assigned to tactical nuclear weapons be accomplished?

If, as many have claimed, U.S. tactical nuclear weapons demonstrated U.S. resolve to support allies with strategic nuclear forces, will the removal of large numbers of weapons signify less resolve on the part of the United States? And if tactical nuclear weapons were needed to deal with deficiencies in both American military capabilities and those of allies, what (if anything) can replace those tactical nuclear weapons that are removed or destroyed? For while tactical nuclear weapons have been reduced and the immediate threat of attack by the former Soviet Union has been all but eliminated, the military requirements that caused the United States to rely so heavily on tactical nuclear weapons have not been entirely eliminated. The answer to the military requirements that tactical nuclear weapons fulfilled may well lie in technologies that allow many missions previously assigned to tactical nuclear weapons to be accomplished by advanced conventional weapons. It is also possible that some missions assigned to strategic nuclear forces could be performed by advanced conventional weapons. Reasons to consider such an option include the possibility of future nuclear weapons scarcity caused both by unilateral arms reductions, arms control agreements, and by technical difficulties currently faced with the production of critical components of nuclear weapons.

In his State of the Union address of January 1992 President Bush announced that:

> After completing 20 planes for which we have begun procurement, we will shut down further production of the B-2 bomber. We will cancel the small ICBM program. We will cease production of new warheads for our sea-based ballistic missiles. We will stop all new production of the Peacekeeper missile. And we will not purchase any more advanced cruise missiles.[8]

He also announced that he had informed President Yeltsin of the Russian Federation that if the Commonwealth of Independent States would eliminate all its land-based multiple-warhead missiles, the United States would do the following:

> We would eliminate all Peacekeeper [MX] missiles. We would reduce the number of warheads on Minuteman missiles to one, and reduce the number of warheads on our sea-based missiles by one-third.[9]

With the reduction of strategic nuclear weapons that the July 1991 Strategic Arms Reductions Treaty (START) calls for and the possible further reductions that any follow-on to START[10] would call for, along with unilateral nuclear arms reductions already proposed, it is possible that there would not be enough warheads to cover all the targets currently in the Single Integrated Operational Plan (SIOP). Changes in the

---

[8]"The State of the Union: Text of President Bush's Address," *Washington Post*, 29 January 1992, A14.

[9]Ibid.

[10]It was agreed prior to the collapse of the Soviet Union that after START was signed the United States and the Soviet Union would quickly begin negotiations on further cuts in strategic nuclear weapons. A popular goal for "Follow-On to START" is 2000-3000 nominal warhead allowances.

SIOP have reportedly already been implemented to deal with the changed international situation (specifically, the breakup of the Warsaw Pact), eliminating "roughly 3,000 potential targets," and providing "for using fewer warheads in various attack options."[11]

Even with the collapse of the Soviet Union and the possibility of further changes to the SIOP, it is conceivable that the United States may find itself unable to hold at risk all of the targets that are considered important because of nuclear weapons scarcities. President Bush's offer to cease production of many new nuclear weapons may have been influenced by current difficulties faced in producing nuclear weapons.

The current shutdown of key nuclear weapons components production sites has postponed and put into doubt the further production of new nuclear warheads. As an example, it appears that the shutdown of the Rocky Flats facility has postponed indefinitely the equipping of all Trident SSBNs with D-5 missiles. One article reports that:

> The U.S. Navy cannot arm fully all of the Trident D5 ballistic missiles equipping three of the new Ohio (SSBN-726) class SSBNs because of a shortage of nuclear warheads. . . . The shutdown was forced by a prolonged shutdown of the Rocky Flats nuclear weapons [plant] near Denver, Co. The shutdown of the Rocky Flats plant is the first known case of a substantial change in U.S. strategic plans forced by industrial problems. . . . it is the only plant making the plutonium 'pits' which form the core of

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[11]R. Jeffrey Smith, "U.S. Trims off Targets in Soviet Union," *Washington Post*, 21 July 1991, A1.

all nuclear warheads. The Government hopes to re-open the plant later this year [1991] but. . . the restart date remains in doubt.[12]

Targets are of course prioritized, but should the planners at the Joint Strategic Target Planning Staff (JSTPS) drop targets if they don't have enough warheads, or should they consider alternative weapons to strike targets that would otherwise be left unattacked?

The thesis will argue that there are non-nuclear weapons that could effectively attack specific targets in the evolving SIOP, thus allowing planners greater latitude in their allocation of shrinking nuclear weapons assets. Additionally, potential threats from regions other than the former Soviet Union will demand increasing attention. The United States will have to determine whether it might respond to such threats with nuclear weapons or, as this thesis will argue, with advanced conventional weapons.

D. SUMMARY

Current changes in the world military and political situation and the coincident revolution offered by conventional weapons technologies have made a greater reliance on advanced conventional weapons practical and imperative. Numerous incentives exist for the substitution of advanced conventional weapons for many of the missions assigned to

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[12]"U.S. Trident SSBNs Not Fully Armed," *Naval Forces*, Vol. XII, No. IV, (1991), 6.

nuclear weapons. Current technologies allow for the production of highly accurate and relatively inexpensive extended-range weapons. Precise delivery systems and more effective conventional warhead technology make possible the substitution of advanced conventional weapons for missions previously assigned, mainly, or exclusively to nuclear weapons.

The following chapters examine incentives for the United States to pursue such substitutions, along with possible implications of a greater reliance on advanced conventional weapons capabilities. The "delegitimization" of nuclear deterrence is examined, as well as environmental concerns over the use and production of nuclear weapons. It will be argued that the "delegitimization" of nuclear deterrence and various concerns about nuclear weapons have combined to make the threat of nuclear weapons employment by the United States less credible. Considerations that make nuclear deterrence less credible may, however, make advanced conventional weapons capabilities more credible.

II. THE DELEGITIMIZATION OF NUCLEAR DETERRENCE

The United States has a number of reasons to pursue further research and development of advanced conventional weapons to replace nuclear weapons. One of the most important reasons may well be the "lapse of faith"[13] in nuclear deterrence, or the "delegitimization of nuclear deterrence"[14] that reached its zenith in the early 1980s in the United States.

This chapter attempts to identify causes of the delegitimization phenomenon. It appears that the ability of the United States to use its nuclear forces to deter its adversaries has declined due to many of the same factors that helped cause the delegitimization of nuclear deterrence. The chapter will argue that advances in conventional weapons technologies mean that the "delegitimization of nuclear deterrence" will only continue to grow in scope. In a number of instances, particularly regional conflicts, conventional deterrence capabilities now offer more credible policy alternatives than nuclear employment threats.

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[13]Robert Tucker, *The Nuclear Debate: Deterrence and the Lapse of Faith* (New York: Holmes & Meier, 1985), 61-89.

[14]David S. Yost, "The Delegitimization of Nuclear Deterrence?," *Armed Forces & Society*, Vol. 16 No. 4, (Summer 1990), 487-508.

A. THE DECLINE IN CONFIDENCE AND U.S. DETERRENCE THEORY

Although there have been periods of anxiety over nuclear weapons and their possible wartime use since 1945, such as during the 1962 Cuban missile crisis, for the most part Americans quietly accepted the necessity for nuclear weapons and their possible use. The American public's resignation to nuclear weapons, however, seemed to change during the 1980s. The anti-nuclear movement achieved unprecedented status during the first Reagan administration. Robert Tucker notes:

> In the 1980s, people did more to express their anxiety over nuclear weapons. Not only did they sign petitions and give money, many of them took (however decorously) to the streets. . . . Moreover, once the nuclear issue had suddenly resurfaced-whether in the form of the freeze or on a more general manner-it became politicized in a way that it never really did in the 1950s and early 1960s.[15]

The early 1980s clearly were marked by a certain decline in confidence in nuclear deterrence, or as David Yost states ". . . a tendency towards a 'delegitimization' of nuclear deterrence . . . emerged in some important sectors of the elite and attentive publics in countries such as Britain, West Germany, and the United States."[16] To understand why this

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[15]Tucker, *The Nuclear Debate*, 4.

[16]"This 'delegitimization' might be defined as (at least in some circles) reduced confidence in the reliability and safety of nuclear deterrence arrangements and lessened certainty about the practical prudence, strategic necessity, and/or moral legitimacy of posing nuclear threats to adversaries." Yost, "The Delegitimization of Nuclear Deterrence?," 487.

delegitimization occurred one must examine the evolution of Western nuclear deterrence theory and why changes occurred.

The idea of deterrence is not new. Since man first walked on this earth the idea of preventing someone from doing something through the threat of force has existed. Glenn Snyder wrote that "deterrence means discouraging the enemy from taking military action by posing him a prospect of cost and risk outweighing his prospective gain."[17]

The United States has always had to concern itself with a number of potential and actual adversaries. During the Cold War, however, American discussions of deterrence theory were confined almost exclusively to deterring the Soviet Union from (a) initiating hostilities or (b) coercing the United States and its allies. In the early years of the Cold War Americans were concerned with preventing the Soviets from overrunning the European continent. According to Albert Wohlstetter,

> The U.S. strategic force was intended from the outset to deter or defend against a Soviet invasion of Western Europe. It was intended to compensate for the Soviet advantage in the theater and the instability that that advantage could mean.[18]

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[17]Glenn H. Snyder, *Deterrence and Defense: Toward a theory of National Security* (Princeton: Princeton University Press, 1961), 3, cited in R.B. Byers ed., *Deterrence in the 1980s: Crisis and Dilemma* (New York: St. Martin's Press, 1985), 11.

[18]Albert Wohlstetter, "The Political and Military Aims of Offense and Defense Innovation," in, Hoffman, Wohlstetter and Yost eds., *Swords and Shields: NATO, the USSR, and New Choices for Long-Range Offense and Defense*, 30.

After 1949, with the first explosion of a Soviet A-bomb, deterrence strategists were also concerned with deterring Soviet nuclear strikes on U.S. territory. Popular American concerns over potential Soviet nuclear attacks on U.S. territory were heightened with the launch of the first man-made satellite, Sputnik I, on 4 October 1957, and the subsequent belief in a missile gap between the Soviet Union and the United States.[19]

Approaches to deterrence can be grouped into two categories: "deterrence by punishment" or "deterrence by denial." According to some U.S. analysts, deterrence by denial is associated with defenses that convince the opponent that he will not meet his objectives. Deterrence by punishment, on the other hand, is based on the threat to inflict unacceptable damage on the enemy in response to his aggression.[20] The former relies on some sort of military

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[19]There were a number of Western analysts who had foreseen a nuclear-armed Soviet Union and concerned themselves with deterring Soviet nuclear actions prior to the Soviet explosion of a nuclear device. With the successful testing, however, the problem became a much more immediate threat to be contemplated by Western analysts and decision-makers. Secretary of State Dean Acheson considered questions of deterring Soviet nuclear actions in his 1949 memorandum. See "Memorandum by the Secretary of State," 20 December 1949, in *Foreign Relations of the United States*, 1949, vol. 1: *Atomic Energy* (Washington D.C.: U.S. Government Printing Office, 1976), 612-17.

[20]Glenn H. Snyder, *Deterrence and Defense: Toward a theory of National Security* (Princeton: Princeton University Press, 1961), 14-16, cited in George H. Quester, *The Future of Nuclear Deterrence* (Lexington Mass.: Lexington Books/D.C. Heath and Company, 1986), 18.

means to stop the enemy from meeting his objective, while the later threatens the enemy with ruinous damage to his homeland in response to his aggression.

Although many argue that from the beginning of the nuclear age the United States has relied on "deterrence by punishment," there were times when "deterrence by denial" was possible.[21] Military planners did not intend to use nuclear weapons to punish the enemy; rather they hoped to deny the enemy the means to achieve military objectives. Aaron Friedberg writes of the "City-Busting" strategy of the period, 1945-1950:

> Essentially, American military planners were looking for ways to defeat superior ground forces as quickly as possible. The best way seemed to be to hit at those cities containing the heart of the Russian war machine.[22]

Nevertheless, for many Westerners it did not matter whether the United States relied on "deterrence by denial" or "deterrence by punishment." The perceived effects of nuclear

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[21]Robert Jervis argues that relying on counterforce strategies does not constitute "deterrence by denial." (See Robert Jervis, *The Meaning of the Nuclear Revolution* [Ithaca, Ny.: Cornell University Press, 1989], 11.) However, one must examine the reason behind such targeting. If American military planners selected counterforce/"damage-limiting" targeting in order to reduce the damage that the Soviets would be able to inflict, thereby denying the Soviets the military goals they had intended for their strategic nuclear forces, then it seems as some form of "deterrence by denial" was taking place.

[22]Aaron Friedberg, "The Evolution of U.S. Strategic 'Doctrine' - 1945-1981," in Samuel P. Huntington, ed., *The Strategic Imperative, New Policies for American Security* (Cambridge, MA: Ballinger, 1982), 65.

weapons use - millions of innocent deaths - remained relatively the same.

While the United States possessed a nuclear monopoly, deterrence by denial was possible since America's nuclear weapons could be used to thwart a Soviet attack with little fear of retaliation. Even after the Soviet Union acquired its own nuclear weapons, deterrence by denial was possible because U.S. nuclear superiority in weapons stockpiles and weapons delivery means was so great that the United States was capable of launching preemptive strikes against the Soviet Union that might have destroyed a majority, if not all, of its nuclear weapons. Even during the time of the 1962 Cuban missile crisis the United States, arguably, had the ability to conduct "damage-limitation" strikes and to retain significant residual nuclear forces to threaten any surviving Soviet nuclear forces. But while deterrence by denial was theoretically possible, the perception (and the reality) was still one of having to threaten millions of civilian lives. In effect elite and public recognition of basic realities about potential large-scale nuclear weapons employment kept the United States from capitalizing on its nuclear superiority. According to McGeorge Bundy,

> We did assert that we had strategic superiority, and we did assert that having it made a difference. What we did not say so loudly was that the principal use of this numerical superiority was in its value as reassurance to

> the American public and as a means of warding off demands for still larger forces.[23]

It was clear to President Kennedy that a "general nuclear exchange, even at the levels of 1961, would be so great a disaster as to be an unexampled failure of statesmanship."[24] Robert Jervis summarizes the evolution of American nuclear thought by writing:

> In the early years of the Cold War, Americans felt quite secure even though the United States did not possess the ability for what would later be called "assured destruction." Indeed in the early 1950s, enthusiasm for a counterforce strategy waned when the analysts at the Rand Corporation found that such a attack would kill up to two million Soviet civilians. In the same way, in 1961 analysts calculated that Soviet retaliation in the event of an American first strike would kill between two and three million Americans in the best case and ten to fifteen million in the worst case. This estimate was more than sufficient to deter the United States from launching such a strike, even during the provocation of the Cuban Missile Crisis.[25]

By the late-1960s to early-1970s[26] almost no one doubted that American nuclear superiority had given way to strategic parity. Many civilian American analysts had, by then, been convinced that "deterrence by punishment" was the only

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[23]McGeorge Bundy, "Strategic Deterrence Thirty Years Later: What Has Changed?," in *The Future of Strategic Deterrence: Part I*, Adelphi Papers 160 (London: The International Institute for Strategic Studies, 1980), 8.

[24]Ibid., 7.

[25]Jervis, *The Meaning of the Nuclear Revolution*, 219.

[26]This is the period usually considered to mark the transition from American nuclear superiority to strategic parity. By the early 1970s most analysts agreed that a practical strategic parity existed between the United States and the Soviet Union.

deterrent option available to the United States and the Soviet Union because of the secure second-strike capabilities that both governments possessed and the coincident belief by many American analysts that nuclear war would mean "Armageddon or nothing."[27]

While assured destruction strategies, which are consistent with "deterrence by punishment," had long played a part in American deterrence theory, with the advent of secure second-strike capabilities on both sides, Mutual Assured Destruction (MAD) became the predominant deterrence strategy among a number of American analysts by the mid-1960s. According to Albert Wohlstetter,

> In the mid-1960s the views of this faction [supporters of MAD] . . . came to have a more than academic influence. Their views became the *declaratory policy* of the U.S. government and in fact inspired the efforts of some of the principal negotiators on the U.S. side at the first Strategic Arms Limitation Talks (SALT) talks and the attempts they made to relate offense and defense in the Anti-Ballistic Missile (ABM) Treaty and the SALT I agreement on offensive forces.[28]

Others, like Robert Jervis, however, argue that MAD is not a strategy but a fact.[29] According to Jervis,

> Mutual second-strike capability has drastically altered the ways in which states can use force to reach their

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[27]An Aspen Strategy Group Report, *Deep Cuts and the Future of Nuclear Deterrence* (Lanham, MD: The Aspen Institute, 1989), 7.

[28]Wohlstetter, "The Political and Military Aims of Offense and Defense Innovation," 7-8.

[29]Jervis, *The Meaning of the Nuclear Revolution*, chapter 3 "MAD Is a Fact, Not a Policy."

> goals. In the past, successful armies could simultaneously seize desired territory, punish the other side, limit or diminish the effectiveness of the other side's arms, and, most important in this context, keep the adversary from doing these things to the state. . . . Defense now being impossible, the superpowers deter their adversaries not by threatening to defeat them, but by raising the threat of conflict to unacceptably high levels . . . It is the prospect of fighting the war rather than the possibility of losing it that induces restraint.[30]

The fact that Mutual Assured Destruction (MAD) became synonymous to many Western analysts and most of the informed general public with the situation the United States and the Soviet Union faced,[31] probably played a significant role in causing or exacerbating the "delegitimization of nuclear deterrence." In all likelihood the belief that a nuclear war with the Soviet Union would result in Mutual Assured Destruction caused many Americans to rethink the military usefulness of nuclear weapons. Additionally, the fears raised by the bellicose language of the early Reagan administration heightened the belief that war with the USSR was probable. According to Robert Tucker,

> The lapse of faith in deterrence has been laid largely at the doorstep of the Reagan administration. A legion of critics insisted that this administration must bear a major responsibility for a movement and debate that might

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[30]Ibid., 8.

[31]It must be noted that a number of Western experts on Soviet military affairs have judged that the Soviets did not agree that MAD was a fact, nor was it a policy of the Soviet Union. Evidence for such a position included Soviet literature and equipment that emphasized surviving and winning a nuclear war. For example, Harriet Fast and William F. Scott, *The Armed Forces of the USSR*, Third Edition (Boulder, Co.: Westview Press, 1984). (See especially 402-404.)

have been avoided by a government with a less ideological and less bellicose outlook.[32]

B. THE CREDIBILITY GAP

If nuclear war with the Soviet Union ultimately meant destruction of both the United States and the Soviet Union, it seemed incredible to many for the United States to threaten its own destruction. As Jervis writes, "[b]ecause the use of strategic nuclear weapons would entail national suicide, there is no rational way for either side to threaten or use them against the other."[33] (Jervis assumes that limited nuclear use options articulated by U.S. officials at various times - e.g., McNamara in 1962 and Schlesinger in 1974 - would lead to uncontrolled nuclear escalation.) R.B. Byers writes that "in the nuclear age the primary (only?) utility of nuclear weapons is to deter attack. . . . The dilemma has been apparent since the bombing of Nagasaki and Hiroshima: how to make credible the incredible."[34] Kissinger may have put it best when he said, "[i]t is not possible indefinitely to tell democratic publics that their security depends on the mass extermination of civilians, unopposed by either defenses or a mitigating

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[32]Tucker, *The Nuclear Debate*, 66-67.

[33]Jervis, *The Meaning of The Nuclear Revolution*, 76, emphasis added.

[34]Byers, *Deterrence in the 1980s*, 16, emphasis in the original.

strategy, without sooner or later producing pacifism and unilateral disarmament."[35]

More factors than just the fear of national suicide have been at work in creating a credibility gap. Among these factors the American way of war and associated perceptions of proper moral conduct of war have had much to do with the growing lack of confidence in the military utility of nuclear weapons.

1. The American Way of War

To understand the moral dilemma that Americans face with respect to nuclear weapons, one must first understand the American way of war. The American way of war has a number of important characteristics that bear upon the potential use of nuclear weapons in war.

The first characteristic of the American way of war is that it attempts to minimize the number of American military casualties. A.J. Bacevich writes of the experience of Korea, "they [the American public] wanted to achieve that end [containing communism] by capitalizing on American strengths, particularly technology, rather than by squandering American manpower."[36] Similarly, General Weyand wrote of the American

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[35]Henry Kissinger, "After Reykjavik: Current East-West Negotiations," *The San Francisco Meeting of the Trilateral Commission*, March 1987, 4, cited in Jervis, *The Meaning of the Nuclear Revolution*, 213.

[36]A. J. Bacevich, *The Pentomic Era* (Washington D.C.: National Defense University Press, 1986), 10.

way of war as follows: "[t]he American way of war is particularly violent, deadly and dreadful. We believe in using 'things'- artillery, bombs, massive firepower - in order to conserve our soldiers' lives."[37]

Nuclear weapons, early in the nuclear era, were held out as the prime examples of weapons that would enable the U.S. to minimize its own battlefield casualties through the use of technology. It is interesting to note that the only wartime use of nuclear weapons has been justified by the judgement that it saved thousands, if not millions, of American lives. President Truman wrote in 1960 that "[t]he dropping of the bombs stopped the war, saved millions of lives."[38]

The traditional American tendency to substitute weapons for manpower helped to lead to the U.S. and NATO declared policy to use nuclear weapons if faced with defeat in the context of a Soviet invasion of Europe. Nuclear weapons offered the chance to reduce the manpower requirements for the American armed forces and, until the Soviet Union obtained nuclear weapons, offered the possibility of lower American and allied casualties sustained in combat. The use of nuclear

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[37]General Fred C. Weyand, "Vietnam Myths and American Realities," *CDRS Calls*, (July-August 1976), 3-4, cited in Harry Summers, Jr., *On Strategy* (New York: Dell Publishing, 1984), 69.

[38]Harry Truman, *Truman Speaks* (New York: Columbia University Press, 1960), 67.

weapons against any populated areas would, however, as with the bombings of Hiroshima and Nagasaki, exact an unacceptable toll on innocent civilians in the eyes of many Americans.

Thus, after the Soviet Union acquired nuclear weapons, many Americans believed that not only would innocent civilians of the enemy be killed or injured, but that any use of nuclear weapons would invite a nuclear response that would also kill millions of Americans. The hope of saving American lives had been behind the first use of nuclear weapons in 1945. After the Soviets gained nuclear weapons, however, it appeared that the use of nuclear weapons against the USSR would likely invite unacceptable American casualties.

Even more important to the rising fears of many was the belief that nuclear war was inevitable. In 1985, Robert Tucker wrote, "[t]he view that nuclear war has become ever more likely, and that if we continue along our present course we will transform a possibility into a probability, is given frequent expression."[39] Thus the fear of nuclear war and its perceived consequences played large roles in creating a lack of confidence in nuclear deterrence policies. Moreover, the moral questions implicit in relying on nuclear deterrence had much to do with the decline in confidence.

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[39]Tucker, *The Nuclear Debate*, 9.

2. The Morality of Nuclear Deterrence

For many Americans war is something that should be aimed solely against an enemy's military. "Our political and moral thought is predicated on limits. Nuclear weapons challenge this assumption by the virtue of their destructiveness and, of course, their rate of destruction."[40] U.S. political and military leaders have traditionally made their limited aims clear. U.S. leaders often declare that they seek to defeat the enemy's military, while professing the hope of minimizing the loss to civilians. McClellan said upon his drive into Virginia, "I have not come here to wage war upon the defenseless, upon non-combatants, upon private property, nor upon the domestic institutions of the land."[41] More recently, President Bush stated, upon initiating the drive to liberate Kuwait, that his problem was not with the Iraqi people, but rather with Saddam Hussein and his military.

Some examples, however, show a different tendency - like Sherman's march through Georgia and LeMay's campaign of fire raids against Japan. According to John Frederick Fuller,

> when Sherman set out on his famous march through Georgia, he made this new concept of war his guiding principle, and waged war against the people of the South as fully as against its armed forces. . . . Terror was the basic factor in Sherman's policy, he openly says so. . . . "We are not only fighting hostile armies, but a hostile

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[40]Ibid., 11.

[41]Russell F. Weigley, *The American Way of War* (Bloomington, IN: Indiana University Press, 1973), 134.

> people, and must make old and young, rich and poor, feel the hard hand of war."[42]

LeMay's bombing campaign against Japan was also directed against the Japanese people themselves. According to Mark Clodfelter,

> These attacks [prior to the fire raids], designed to support the planned invasion of Japan, produced little damage because of the dispersal of the Japanese aircraft industry . . . As a result, LeMay searched for a new method to conduct strategic bombing. . . . Japanese cities also contained a large number of highly inflammable wooden structures, and much of the American public sought maximum retribution for Pearl Harbor. These combined factors led LeMay to initiate the firebombing of Japan. . . . LeMay's incendiary assault and the atomic raids that followed revealed a new emphasis in the strategic campaign against Japan: the direct destruction of the enemy's will to resist.[43]

Americans, nevertheless, believe that they maintain the highest moral standards in the conduct of war. As one author wrote, "Soviet Communism did little to affect her [America's] sense of moral and political superiority. Such superiority, after all, was natural because democracy was by definition pacific."[44]

Many factors have been involved in the delegitimization of nuclear deterrence. But "[i]t [the

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[42]*The War of the Rebellion*, Vol.LXXIX, 162, cited in Major-General J.F.C. Fuller, *The Conduct of War* (Minerva Press, 1968), 108-109.

[43]Mark Clodfelter, *The Limits of Air Power* (New York: The Free Press, 1989), 7.

[44]Curt Gasteyger, "The Determinants of Change: Deterrence and the Political Environment," a chapter in *The Future of Strategic Deterrence: Part II*, Adelphi Papers 161 (London: The International Institute for Strategic Studies, 1980), 3.

delegitimization] must also be attributed to the conviction that deterrence represents a fall from grace and that it constitutes a kind of moral purgatory, a state of near sin from which we should do our utmost to escape."[45] While not declaring nuclear deterrence to be a fall from grace, the U.S. National Conference of Catholic Bishops did have a part in the delegitimization of nuclear deterrence. "The Catholic and United Presbyterian churches have raised serious questions about the morality of deterrence, and U.S. nuclear deterrence policy in particular."[46]

a. The National Conference of Catholic Bishops

In May 1983 the National Conference of Catholic Bishops agreed to a position on nuclear deterrence,[47] and in June 1988[48] they reiterated this position. While the Bishops agreed that the maintenance of nuclear weapons for the sake of deterrence was justified, they came to quite a different opinion on the actual use of nuclear weapons. The Bishops said of nuclear war:

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[45]Tucker, *The Nuclear Debate*, 17.

[46]Keith Payne and Jill Coleman, "Christian Nuclear Pacifism and Just War Theory: Are They Compatible?" *Comparative Strategy*, Vol. 7, 1988, 75.

[47]The National Conference of Catholic Bishops, *The Challenge of Peace: A Pastoral Letter on War and Peace*, 3 May 1983.

[48]The National Conference of Catholic Bishops, *Building Peace*, A Report on *The Challenge of Peace* and Policy Developments 1983-1988, June 1988.

> Nuclear war remains a possibility, but it is increasingly seen as devoid of the rational political purpose and moral limits which have made war a justifiable activity in the past. Nuclear weapons threaten to destroy the very objectives which have provided the political and moral justification for using force . . . . The uniqueness (posed by nuclear weapons) arises from the scope and degree of devastation these weapons can wreak.[49]

The Bishops make clear that they would oppose any nuclear attacks near population centers, even in retaliation to Soviet countercity strikes. The following illustrates the point:

> Under no circumstances may nuclear weapons or other instruments of mass slaughter be used for the purpose of destroying population centers or other predominantly civilian targets . . . the principle holds even if our cities have been struck by the adversary.[50]

There are, of course, many other religious and political groups that hold similar positions on nuclear deterrence. There were also many critics of the Bishops' report. While disagreeing with the Bishops on many of their positions, even critics of the Bishops' report acknowledged the moral dilemmas that anyone contemplating the operational use of nuclear weapons must face.

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[49]Ibid., 19.

[50]Ibid., 31.

b. Critics of the National Conference of Catholic Bishops' Report

Sir Michael Quinlan notes that "[t]hose who believe that the use of nuclear weapons[51] might in some extreme circumstance be justifiable face two main difficulties . . . the first difficulty is how any final strategic blow heavy enough for its prospect to underpin deterrence could avoid being too indiscriminate and disproportionate to be morally tolerable. The second concerns risk that any use of nuclear weapons might start an uncontrollable process leading to an intolerable outcome."[52] Albert Wohlstetter states that, "[i]nformed realists in foreign-policy establishments as well as pacifists should oppose aiming to kill bystanders with nuclear or conventional weapons: *indiscriminate* Western threats paralyze the West, not the East."[53] How does this apparent unanimity of opinion against the destruction of innocents complement the American way of war?

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[51]Sir Michael is not concerned "with narrowly-specific uses like ballistic-missile interception and antisubmarine warfare, or single-shot 'no target' demonstrations. Deterrence cannot be built on these alone." See Sir Michael Quinlan, "The Ethics of Nuclear Deterrence: A Critical Comment on the Pastoral Letter of the U.S. Catholic Bishops," *Theological Studies*, (Quinlan footnote 6) Vol. 48 (1987), 8.

[52]Ibid., 8.

[53]Albert Wohlstetter, "Bishops, Statesman, and Other Strategists On the Bombing of Innocents," *Commentary*, vol. 75, June 1983, 15.

c. The Moral Dilemma and the American Way of War

It is readily apparent that an intimate connection between the American way of war and the moral prohibitions of the Catholic Bishops exists. The inhibitions about threatening to attack military targets near population centers with nuclear weapons hinge on the general (and presumably well-founded) presumption that a nuclear attack near population centers would inevitably lead to large numbers of innocents being killed. The widespread judgement that the use of nuclear weapons against targets in populated regions would cause indiscriminate damage has had obvious effects on the willingness of U. S. administrations to use any nuclear options during armed conflicts of recent history. Because of the American way of war, much of the serious debate over nuclear weapons has been confined to the subject of deterrence. According to Colin Gray,

> the United States has been unable, to date, to come to grips with the prospect of viewing, and planning for nuclear war as *war*. American, and more generally, Western democratic values are deemed to be so incompatible with the actual conduct and consequences of nuclear war that the vast bulk of U.S. nuclear-age strategic thinking has been confined to the problems of prewar deterrence.[54]

The predicted effects of any wartime use of nuclear weapons contrast sharply with the American way of war. These effects have, therefore, along with the increases in potential

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[54]Colin S. Gray, *Nuclear Strategy and National Style* (Lanham, Md.: Hamilton Press, 1986), 40.

capability available in advanced conventional weapons, encouraged the development and production of advanced conventional weapons to substitute for nuclear munitions. As Albert Wohlstetter puts it, "we have urgent political and military as well as moral grounds for improving our ability to answer an attack on Western military forces with less unintended killing, not to mention deliberate mass slaughter."[55] The moral and practical arguments, in effect, call for the replacement of weapons of relative disutility with weapons of greater utility. Utility is here defined by decreased collateral damage.

Moreover, with the changes that have occurred in recent years it can be argued that the major remaining value of nuclear weapons (namely for the deterrence of nuclear aggression or coercion by the Soviet Union) has decreased in urgency. Even before the collapse of the Soviet Union at the end of 1991, it was clear that, as Leon Sloss observed, "the Soviet threat has changed significantly. Today aggression by the Soviet Union is highly unlikely."[56] Today, with the collapse of the Soviet Union, the threat has diminished further. Lt. Gen. James R. Clapper, USAF, Director of the Defense Intelligence Agency, and Robert M. Gates, Director of

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[55]Wohlstetter, "Bishops, Statesman, and Other Strategists On the Bombing of Innocents," 15.

[56]Leon Sloss, "U.S. Strategic Forces After the Cold War: Policies and Strategies," *The Washington Quarterly*, Autumn 1991, 145.

the Central Intelligence Agency, recently testified before Congress on the threat from the former Soviet Union. General Clapper said, "I see virtually no likelihood of premeditated Russian or commonwealth military aggression against the U.S. and its allies. The intentions of the new commonwealth states toward the West have clearly changed, and overall, the military successor states are in profound decline."[57] Director Gates added, "The threat to the United States of deliberate attack from that quarter has all but disappeared for the foreseeable future."[58]

Increasingly the United States will find itself facing nuclear and non-nuclear "emerging powers" as adversaries. Advanced conventional weapons could play a significant role against such potential adversaries. A recent military panel came to similar conclusions. According to the Reed Report, as it is popularly referred to,

> American armed forces have engaged in combat in the Third World on a number of occasions during the nuclear age. Most recently, in the Gulf War, the U.S.-led coalition faced an Iraqi army which on the eve of Desert Storm was assessed to be second only to Israel on the Middle East in terms of military capability. . . . resulting in one of the most lopsided victories in history. It also ushered

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[57]General Clapper cited in Elaine Sciolino, "C.I.A. Chief Says Threat By Ex-Soviets Is Small," *The New York Times*, 23 Jan. 1992, A8.

[58]Ibid.

in a new age of technological warfare which suggests some of the potential for non-nuclear strategic weapons.[59]

The ability of the United States, however, to credibly threaten nuclear retaliation against non-nuclear powers is highly doubtful. The credibility of threatening non-nuclear powers has diminished both because of domestic political pressures and because of the fact that overt nuclear threats have not been made against a non-nuclear adversary since the United States threatened China with nuclear weapons use during the Korean War and regarding the Formosa Straits in the late 1950s.

C. NUCLEAR COERCION

Some argue that the United States was able to use its nuclear superiority to coerce the Soviets on a number of occasions. Specific examples of U.S. use of nuclear threats to coerce the Soviets have been advanced.

President Eisenhower, for example, used nuclear threats against the Soviets during the 1959 Berlin Crisis. When questioned by a reporter if the United States was ready "to use nuclear weapons if necessary to defend free Berlin," President Eisenhower replied, "Well, I don't know how you

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[59]Thomas C. Reed and Michael O. Wheeler, *The Role of Nuclear Weapons in The New World Order*, (mimeo, January 1992), 12. Thomas Reed was Secretary of the Air Force from 1976 to 1977. He was also the chairman of the panel that investigated the role of nuclear weapons in the new world order. The resulting report, therefore, is often referred to as the "Reed Report."

could free anything with nuclear weapons." He went on to say, however, that the United States was prepared to meet its "responsibilities with respect to Berlin."[60] And in his memoirs he wrote,

> While giving Khrushchev every opportunity to be sensible, we were determined that he should have no reason to question our readiness and capacity to defend our rights. "In this gamble," I said, "we are not going to be betting white chips, building up the pot gradually and fearfully. Khrushchev should know that when we decide to act, our whole stack will be in the pot."[61]

President Kennedy also used nuclear threats against the Soviet Union during the Cuban missile crisis. Many feared that the Kennedy administration had taken the United States to the brink of nuclear war with the Soviets in order to force the Soviet Union to withdraw its nuclear missiles from Cuba. Others, however, would argue that President Kennedy used the offer of withdrawing nuclear missiles from Turkey, in order to obtain the concession he desired from the Soviets.[62] It seems clear, though, that nuclear coercion or compellence was, at least, in part used to achieve the desired results.

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[60]U.S. President, *Public Papers of the Presidents of the United States* (Washington D.C.:Office of the *Federal Register*, National Archives and Record Service, 1959), Dwight D, Eisenhower, 1958, 245.

[61]Dwight D. Eisenhower, *Waging Peace* (Garden City, NY: Doubleday & Company, Inc., 1965), 338-39.

[62]Raymond Garthoff, *Reflections on the Cuban Missile Crisis* (Washington D.C.: The Brookings Institution, 1989). While Garthoff does not make the argument that only Kennedy's concessions contributed to the Soviet withdrawal of nuclear missiles from Cuba, the impression is that the concessions were a major factor.

A more recent example of nuclear coercion came during the 1973 Arab-Israeli War. The Nixon Administration put the nuclear forces on alert in response to a Soviet threat to intervene on the behalf of the Egyptians. The use of the American nuclear threat apparently kept the Soviets from carrying out their threat.[63]

While nuclear weapons were successful in constraining Soviet responses in many areas of the globe, some question the continuing utility of nuclear coercion against Russia and the other successor states of the former Soviet Union. Some Soviet statements imply that American nuclear threats early in the Cold War coerced the Soviets from completing many moves they had begun. As their nuclear stockpile grew, however, they believed that the United States could no longer coerce them. According to David Yost,

> The Soviets in the late 1960s and early 1970s attributed key changes in U.S. and NATO strategy to the growth of Soviet nuclear forces, which deprived previous U.S. nuclear threats of credibility. In 1970 General Lieutenant I.G. Zav'yalov wrote as follows: "The successes achieved in the Soviet Union in the [nuclear] sphere had a sobering effect on the reactionary circles of imperialist states, became the restraining factor in the path of their aggressive aspirations, and compelled them to change their strategic concepts. As a result, the 'strategy of flexible response' emerged first in the

[63]Barry Blechman and Douglas Hart, "The Political Utility of Nuclear Weapons," in Steven Miller, ed., *Strategy and Nuclear Deterrence*, An *International Security* Reader (Princeton, NJ.: Princeton University Press, 1984), 272-297.

United States, and later was also adopted by the aggressive NATO Bloc."[64]

Early periods of the Cold War offer examples of the United States using nuclear threats to coerce a non-Soviet opponent. While not all threats were explicit, there were at least implicit threats of nuclear response during a number of crises.

President Eisenhower used both implicit and explicit threats. During the Korean War President Eisenhower let the North Koreans and Chinese know that he would use nuclear weapons if they did not return to the negotiating table and make significant progress on American proposals. "In late May [1953] Secretary of State John Foster Dulles communicated this message to India's Prime Minister Jawaharlal Nehru for relay to China. Eisenhower also sent this message to Peking through Chinese officials at Panmunjom."[65]

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[64]General Lieutenant I.G. Zav'yalov, "the New Weapon and Military Art," *Red Star*, October 30, 1970, in *Selected Soviet Military Writings*, 1970-1975, translated and published under the auspices of the U.S. Air Force (Washington D.C.: Government Printing Office, 1977), 207, cited in David S. Yost, *Soviet Ballistic Missile Defense and the Western Alliance* (Cambridge, MA: Harvard University Press, 1988), 159-160.

[65]Edward C. Keefer, "President Dwight D. Eisenhower and the End of the Korean War," *Diplomatic History* 10 (Summer 1986): 280. "In 1965, Eisenhower told Army General Andrew Goodpaster that 'he had passed word secretly to the Chinese at the time of Korea that if they failed to stop the war they were liable to direct attack by us, including nuclear weapon attack.' See 'Meeting with General Eisenhower, 12 May 1965,' memorandum, Goodpaster to President Johnson, National Security Files, Name File: President Eisenhower, Lyndon Baines Johnson Library, Austin, Texas, Box 3. Cited in Mark

During the crisis over the Chinese offshore islands of Quemoy and Matsu, Eisenhower relied on nuclear threats to deter the Chinese mainland government from going to war in the Formosa Straits. When asked to comment on Secretary of State John Foster Dulles' comment that the administration was prepared to use tactical nuclear weapons in case of Chinese aggression, Eisenhower replied:

> Now, in any combat where these things [tactical atomic weapons] can be used on strictly military targets and for strictly military purposes, I see no reason why they shouldn't be used just exactly as you would use a bullet.[66]

He wrote in his memoirs that he "hoped this answer would have some effect in persuading the Chinese Communists of the strength of our determination."[67]

D. ABSENCE OF U.S. ATTEMPTS OF COERCION

U.S. experiences in attempting to use nuclear coercion against non-nuclear nations, however, have shown a definite history of declining utility. Much of the reason for the declining ability to credibly coerce non-nuclear nations has

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Clodfelter, *The Limits of Air Power*, endnote 52, 14.

[66]U.S. President, *Public Papers of the Presidents of the United States* (Washington D.C.:Office of the *Federal Register*, National Archives and Record Service, 1955), Dwight D, Eisenhower, 1955, 332 cited in Robert A. Devine, *Eisenhower and the Cold War* (New York: Oxford University Press, 1981), 62.

[67]Dwight D. Eisenhower, *Mandate For Change* (Garden City, NY: Doubleday & Company, Inc., 1963), 477.

to do with the American way of war and the self-restraint that comes from it. The Reed report referred to Secretary of State Vance's 1978 pledge "that the U.S. would not use nuclear weapons against any non-nuclear weapons state party to the Nuclear Non-Proliferation Treaty or to any comparable internationally binding commitment not to acquire nuclear explosive devices."[68] The report concluded,

> In cases of clear aggression which threaten fundamental U.S. interests, especially where weapons of mass destruction or other highly lethal weapons are involved, the United States should retain an option to leave ambiguous whether it would employ nuclear weapons in retaliation to gross acts on the part of the aggressor.[69]

During the French involvement in Indochina, at the battle of Dien Bien Phu, some U.S. military leaders reportedly

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[68]On 12 June 1978, Secretary of State Vance said that "the President has decided to elaborate the U.S. position on the question of security assurances. His objective is to encourage support for halting the spread of nuclear weapons, to increase international security and stability, and to create a more positive environment for success of the Special Session. To this end, the President declares: 'The United States will not use nuclear weapons against any non-nuclear weapons 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 weapons state, or associated with a nuclear weapons state in carrying out or sustaining the attack.'" Cyrus Vance statement to the U.N. Special Session on Disarmament, cited in United States Arms Control and Disarmament Agency, *Arms Control and Disarmament Agreements: Text and Histories of Negotiations* ([Washington D.C.] U.S. Arms Control and Disarmament Agency, 1982), 87.

[69]Reed and Wheeler, *The Role of Nuclear Weapons in the New World Order*, 18-19.

indicated a willingness to contemplate the use of nuclear weapons against the Vietminh. According to Stanley Karnow,

> The idea tantalized Radford [Adm. Radford was then the Chairman of the Joint Chiefs of Staff], and he favored its proposal to the French. But the notion alarmed senior State Department officials, one of whom warned that, if the French were approached, "the story would certainly leak" and spark "a great hue and cry throughout the parliaments of the free world."[70]

It is noteworthy that the United States did not use nuclear threats against the Vietminh or the North Vietnamese. Although the use of nuclear weapons to help the French at the Battle of Dien Bien Phu reportedly was considered by some U.S. officials, this idea was quickly dismissed. According to Stephen Ambrose,

> Within the U.S. military, discussion favored the use of low yield nuclear weapons. Eisenhower. . . when these discussions were reported to him. . . responded "You boys must be crazy. We can't use those awful things against Asians for a second time in less than ten years. My God."[71]

The reasons for not relying on nuclear threats or employment against the Vietminh were numerous. Along with the fear of the international community's response to the use of nuclear weapons was the judgement "that this would still have involved committing large numbers of ground forces to Indo-

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[70]Stanley Karnow, *Vietnam - A History* (New York: The Viking Press, 1983), 197.

[71]Stephen E. Ambrose, *Eisenhower* (New York: Simon & Schuster, 1983), vol. 2, 184, cited in Carl Kaysen, Robert McNamara, and George Rathjens, Nuclear Weapons After the Cold War," *Foreign Affairs*, 100.

China."[72] Clearly, however, anticipated domestic and international responses to nuclear threats played a role in restraining the United States government from using nuclear threats.

After the French had abandoned Vietnam, and the Americans had committed themselves to the defense of South Vietnam, the Americans continued to refrain from making nuclear threats against the North Vietnamese. Most American policy planners of the time believed that the Vietcong were communist insurgents from North Vietnam, supported by China and the Soviet Union. Nonetheless, the United States did not rely on nuclear threats to attempt to halt the insurgency or resupply of the Communists in the South from the North.

Even during the December Bombings of 1972, nuclear threats were conspicuously absent. While the political aims of the Nixon administration were similar to those of the Eisenhower administration during the Korean war (to force the adversary back to the negotiating table to accept terms favorable to the United States short of victory), there were no similar nuclear threats. Even more striking, however, was the domestic and international backlash to the bombing campaign. As one author noted, "the surge of domestic criticism dismayed both military and civil leadership."[73] Clearly, the domestic pressures

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[72]Lawrence Freedman, *The Evolution of Nuclear Strategy* (New York: St. Martin's Press, 1981), 89.

[73]Clodfelter, *The Limits of Air Power*, 191.

that the United States faced with respect to the conduct of the war after 1967 would not have allowed a President to use overt nuclear threats against the North Vietnamese.

Interestingly, while succeeding U.S. administrations felt restrained from making nuclear threats against nonnuclear North Vietnam, in 1973 the Nixon administration relied on nuclear threats to counter Soviet moves in the Middle East. It is not known if, and to what extent, covert nuclear threats may have been used in Vietnam; but it is clear that the United States did not use its nuclear arsenal explicitly to coerce the communist enemy as during the Korean War.

Recently during the Gulf War, there again was a conspicuous lack of U.S. nuclear coercion, even though Iraq was not a nuclear power. Although one can argue that the United States did rely on implicit nuclear threats against Iraq, it is clear that domestic and international pressures precluded the coalition, and in particular the United States, from explicitly threatening nuclear retaliation in response to possible Iraqi use of chemical weapons.

The Bush administration warned the Iraqis that the United States would retaliate if chemical weapons were used. What is not clear is what form American or coalition retaliation would have taken. While President Bush never publicly ruled out the use of nuclear weapons, he also never explicitly threatened their use. From early in the crisis, President Bush tried to

leave all his potential responses to Iraq open, while trying to avoid using explicit nuclear threats.

On February 5, 1991, President Bush responded to questions on possible American responses to Iraqi chemical weapons attacks by stating:

> Well, I think it's better to never say what option you may be considering or may or may not do. . . . I would like to take the opportunity, in responding to your question to say he [Saddam Hussein] ought to think very carefully about doing that. Very, very carefully. And I will leave that up to a very fuzzy interpretation because I would like to have every possible chance that he decide not to do this [use chemical weapons].[74]

Bush's statement may have hinted at nuclear weapons use in response to chemical weapons use. Due to the varied backgrounds of the coalition, however, it is quite probable that the administration believed that it would be politically impossible to respond to an Iraqi chemical weapon attack with a retaliatory use of weapons of mass destruction. It seems highly unlikely that in a "new world order" the international community, much less the Arab community, would have accepted a nuclear weapons response to chemical attack as in keeping with the principles of such a "new world order." In all likelihood, a nuclear response would have seemed disproportionate.

Moreover, by the time President Bush made his remarks the air war was well in progress. Most, if not all, of the

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[74]"Excerpts from Talk by Bush on Gulf War," *New York Times*, 6 February 1991, A10.

potential targets that analysts had said nuclear weapons might be used against were already being attacked with conventional weapons. Even hardened targets that posed problems for early conventional attacks were being slated for attack with new larger-yield conventional weapons that would have negated the need for nuclear weapons use.[75] The use of nuclear weapons on, for example, super-hardened command and control facilities in Iraq would have almost certainly caused significant numbers of civilian deaths. As it was, the destruction of an Iraqi command and control center that held a number of Iraqi civilians caused noteworthy controversy both within the United States and throughout the international community.[76]

Many have commented that Saddam Hussein did not believe that the Americans were truly resolved to remove his forces from Kuwait. It must also be said that he never showed any signs of believing that the United States would resort to nuclear weapons. While no one can claim to know Saddam's thoughts and cognitive process, an argument can be made that past U.S. performance, both in the Middle East and Southeast

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[75]See DoD, *Conduct of the Persian Gulf Conflict: An Interim Report to Congress*, (Washington D.C.: Department of Defense, 1991), 8-1.

[76]For an account of the bombing and the political effects of the bombing, see Andrew Rosental, "Bush's Quandry," *New York Times*, 14 Feb. 1991, A1, A17; Craig Whitney, "Bombing Puts Britain's Government on Defensive," Ibid., A19; Peter Applebome, "Carnage in Baghdad Erases Image of an Antiseptic War," Ibid.; Clyde Haberman, "Arabs in Many Nations Protest Bombing," Ibid., 15 Feb. 1991, A13.

Asia, may have led him to believe that the United States would not have the political will to conduct an all-out war, much less to use nuclear weapons, against Iraq's military and political leadership. A few remarks by Saddam Hussein may shed light on his misconceptions:

> **Rather**: What are the chances that you underestimate the power of the United States military? What are the chances that a quick, powerful strike could knock you out immediately?
>
> **Hussein**: No single strike, however destructive, however potential, can destroy a whole people. The United States relies on the Air Force, and the air force has never been the decisive factor in a battle in the history of wars.
>
> **Rather**: If you are attacked by the United States-
>
> **Hussein**: You mean if we are attacked by the United States from Saudi Territory.[77]

One can easily interpret Saddam's remarks as those of a man who did not fear the American military or its nuclear weapons. One can also speculate that Saddam did not fear U.S. nuclear responses because: (1) there were no explicit nuclear threats made by the United States, and (2) the United States has had a recent history of not threatening non-nuclear adversaries with potential nuclear strikes.[78] While not eliminating the need for nuclear deterrence, all of these factors combine to

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[77]"Excerpts From Interview With Hussein on Crisis in Gulf," *New York Times*, 31 Aug. 1990, A10.

[78]See Secretary of State, Cyrus Vance, statement to the U.N. Special Session on Disarmament, cited in United States Arms Control and Disarmament Agency, *Arms Control and Disarmament Agreements: Text and Histories of Negotiations* ([Washington D.C.] U.S. Arms Control and Disarmament Agency, 1982), 87. (See footnote 68)

increase the attractions of "conventional deterrence capabilities."

E. SUMMARY

American deterrence theory has gone through an evolution. Nuclear weapons were seen early in their history as weapons that could save American lives. Because of their relative inexpensiveness, many of the political shortcomings of the weapons were overlooked. As the U.S. monopoly vanished and the declining American superiority in nuclear weapons became evident, many questioned the utility of nuclear weapons. Nuclear weapons offered great destructive potential, but relatively little discrimination, while at the same time increasingly offering tne chance of greater American casualties in the event of a nuclear war. Thus, principal precepts of the American way of war and just war theory - the idea that war should remain limited to combatants and that American lives should be conserved - were hard to reconcile with the probable consequences of a major nuclear war with the Soviets. Because of the conflict between the American way of war and the perceived probable outcome of a nuclear war, much of the previously projected utility of nuclear weapons for military operations was lost.

As history has shown, the number of missions in which nuclear weapons has been considered politically useful has continued to decline. Because of domestic and international

perceptions of nuclear weapons, it has for many years been less credible than it was in the 1950s to threaten nuclear weapons use against nonnuclear nations. At the same time the perception that nuclear war between the two superpowers would mean national suicide has increasingly meant that many believe the only mission nuclear weapons are useful for is deterring nuclear attack on the United States. The likelihood that nuclear deterrence, especially with regard to regional conflicts, will continue to be less politically relevant makes it increasingly important to find credible alternatives to nuclear threats.

> Advances in the technologies of precision, discrimination, and control mean the West can choose not to rely on the incredible threat of indiscriminate destruction of innocent civilians to deter war. The West can choose a strategy that protects and defends its values, not one that is at odds with them.[79]

The delegitimization of nuclear deterrence appears likely to persist, especially in the presence of non-nuclear alternative military policies. For, as Adam Garfinkle notes,

> Sometimes the moral and the practical merge, most notably in the reasoning that holds [nuclear] deterrence to be less attractive morally to the extent that practical alternatives to it, political or technical, may exist or come to exist. In other words, it is morally acceptable to tolerate the lesser of many evils on the condition that once it stops being the lesser of many evils, one stops tolerating it.[80]

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[79]Paul Kozemchak, "New Guidance for Nuclear and Nonnuclear Weapons," 261.

[80]Adam Garfinkle, "The Attack on Deterrence: Reflections on Morality and Strategic Praxis," *Journal of Strategic Studies*, Vol. 12, No. 2, June 1989, 166.

III. TECHNICAL, ENVIRONMENTAL, AND SECURITY PROBLEMS ASSOCIATED WITH NUCLEAR WEAPONS

In the period from the 1950s to the end of the cold war in 1989/1991, nuclear weapons were seen as an economical way to amass military power. While some political liabilities were acknowledged, for the most part it seemed that the continued development and deployment of nuclear weapons was assured. In the new global political climate, however, environmental concerns associated with the deployment, and possible wartime use of nuclear weapons have emerged from relative obscurity and have placed U.S.nuclear weapons production capabilities in question.

This chapter examines contemporary environmental concerns concerning nuclear weapons. Contemporary concerns over the effects of nuclear weapons increased greatly with the popularization of the "nuclear winter" theory in 1983. While the "nuclear winter" theory may be seen as "poor science" by informed decision-makers, this chapter reviews evidence suggesting that the general public and many of the elite public either believe the theory to be valid, or have enough unanswered questions, that the "nuclear winter" theory still plays a part in the average American's opinion of the usability of nuclear weapons. Additionally, the current state of U.S. nuclear weapons production facilities and the

contemporary apprehensions over nuclear weapons safety are examined. Lastly, the chapter considers some military liabilities associated with the storage, transportation, and use of nuclear weapons.

Widespread environmental concerns, along with the changes in the current global political climate, have combined to make it harder, if not impossible, to convince the U.S. Congress of the need to build new, or to reopen old, Department of Energy nuclear production facilities. A decision not to build or reinstate production facilities could well mean that the United States will be constrained to a relatively small nuclear force. Moreover, if the political will to reopen old, or open new, nuclear weapons production facilities faltered, the United States could effectively lose much of its industrial capability to build nuclear weapons both now and in the future.

A. THE "NUCLEAR WINTER" EPISODE AND ENVIRONMENTAL AWARENESS

Any discussion of contemporary environmental concerns over nuclear weapons must begin by examining the popular theory of "Nuclear Winter." The nuclear winter theory first gained popular attention in 1983 with the publication of the so-called TTAPS study, so named for the initials of the

authors.[81] Carl Sagan emerged to become the foremost spokesman of the nuclear winter theory regarding the possible consequences of a nuclear exchange. He made the theory known to the general public with his many appearances on television talk shows and appearances before Congress.

The TTAPS article discussed numerous nuclear exchange scenarios from 100 to 25,000 MT.

> The nuclear winter theory postulates that even a minor nuclear exchange, especially if it is targeted on cities, would generate massive amounts of soot and dust that would be lifted by superheated air over burning target areas into the upper atmosphere, blocking sunlight from the Earth's surface and plunging much of the world into frigid gloom.[82]

The article concluded with seven tentative conclusions, all of which combined to paint an apocalyptical scenario, even at levels of destruction that were previously believed to involve relatively small numbers of nuclear weapons. According to the TTAPS report:

> Relatively large climatic effects could result even from relatively small nuclear exchanges (100 to 1000 MT) if urban areas were heavily targeted, because as little as 100 MT is sufficient to devastate and burn several hundred of the world's major urban areas. Such a low threshold yield for massive smoke emissions, although scenario-dependent, implies that even limited nuclear exchanges could trigger severe aftereffects.[83]

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[81]R.P. Turco et al., "Nuclear Winter: Global Consequences of Multiple Nuclear Explosions," *Science*, 23 December 1983, (referred to as the TTAPS Study).

[82]J. J. Gertler, *Some Policy Implications of Nuclear Winter* (Washington D.C.: The Rand Corporation, P-7045, January 1985), 2.

[83]TTAPS Study, 1290.

More alarming, perhaps, was the accompanying article entitled the "Long-Term Biological Consequences of War."[84] The authors attempted to set a threshold for the occurrence of "nuclear winter." They concluded by setting a theoretical limit of 500 MT.[85] Moreover, they claimed that in a limited war of 500 MT or less it seemed "unlikely that even in these circumstances *Homo sapiens* would be forced to extinction immediately."[86] The report went on to say, however, "[i]n any large-scale nuclear exchange between the superpowers . . . the possibility of the extinction of *Homo sapiens* cannot be excluded."[87]

Almost immediately after the report was published it was attacked by scientists for its failure to respect scientific methodologies and dismissed as "poor science" by most researchers. One of the first and most important criticisms of the TTAPS report was that it relied on a one-dimensional model. Therefore,

> it did not take into account north-south and east-west directions, but instead treated the earth as a homogeneous all-land sphere having a temperature that depended only on up-down direction (atmospheric altitude). Thus, the model had no geography, no winds, no seasons, instantaneous spread of smoke to the hemispheric scale, and no feedback

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[84]Paul R. Erlich et al., "The Long-Term Biological Consequences of Nuclear War," *Science*, 23 Dec. 1983.

[85]Ibid., 1299.

[86]Ibid.

[87]Ibid.

> of atmospheric circulation changes on the rate of smoke washout by rainfall.[88]

When a more sophisticated three-dimensional model was developed and run, significantly different results occurred. The National Center for Atmospheric Research developed a three-dimensional model and ran three scenarios using three different amounts of moderately black smoke. The initial findings were reported in an article entitled "Nuclear Winter Reappraised," in the Summer 1986 issue of *Foreign Affairs*. The authors concluded the following:

> the oceans, with their vast storage of heat, would reduce the magnitude of average continental cooling by a factor of two in summer, compares to the cooling calculated by assuming a land-covered planet. . . . the average temperature changes from the northern hemisphere mid-latitudes are considerably smaller than the original estimates of one-dimensional models. . . .[89] The reasons for the moderation of temperature compared to the original calculations are well understood. First, the oceans have a large heat capacity, which ameliorates the cooling over land. Second, about three-fourths of the smoke is removed from the model's atmosphere over the course of 30 days. Third, the infrared "greenhouse" effect of the smoke, does produce a significant mitigation of the surface cooling. We must stress that our results are for July, the month in which the temperature changes are likely to be the largest.[90]

Additionally, the TTAPS report assumes that urban areas would be heavily targeted and that at least 100 MT aggregate yield would be used against urban areas. The most likely U.S.

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[88]Stanley L. Thompson and Stephen Schneider, "Nuclear Winter Reappraised," *Foreign Affairs*, Summer 1986, 984-85.

[89]Ibid., 987-88.

[90]Ibid., 993-995.

and NATO nuclear employment strategies, however, involved much less than 100 MT aggregate yield.[91] Furthermore, U.S. and NATO nuclear strategy included a conscious decision to largely avoid urban areas, opting instead for military targets in relatively unpopulated areas in selective employment plans intended to end hostilities and restore deterrence.

One of the most critical reviews came from Russell Seitz, who called the nuclear winter theory "a politicization of science sufficient to result in the advertizing of mere conjecture as hard fact."[92] According to Seitz,

> One way to see the TTAPS model is as a long series of conjectures: if this mich smoke goes up, if it is this dense, if it rose like this, and so on. This series of coin tosses was represented to laymen and scientists alike as a "sophisticated one-dimensional model" - a usage that is oxymoronic . . . For while there might be a "clear possibility" of a dire outcome on any single one of the model's forty elements, the probability of so long a string of coin tosses all coming up heads is astronomical."[93]

While nuclear winter remains a discredited theory, some continue to insist that the possibility of nuclear winter still exists. Moreover, while experts on nuclear weapons and their effects are familiar with the serious doubts associated with the nuclear winter theory, most of the general public is apt not to be familiar with these doubts. Because of the vast

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[91]See Albert Wohlstetter, "Between an Unfree World and None," *Foreign Affairs* (Summer 1985), 978-979.

[92]Russell Seitz, "In From the Cold: 'Nuclear Winter' Melts Down," *The National Interest*, Fall 1986, 3.

[93]Ibid., 5.

amounts of time and effort spent on disseminating the theory to the public, early on, and the almost complete absence of popular critical reviews of the theory (such as on the front page of the *New York Times* or the top story on the evening news), a large portion of the general public may still be convinced that nuclear winter is a valid theory. Others, moreover, while questioning the validity of the nuclear winter theory, prescribe nuclear weapons policy alternatives that take nuclear winter into consideration (e.g. Colin Gray[94], Philip Romero[95], and J. Gertler[96]). These prescribed policies give credibility to the theory simply by taking it into account.

Increasingly, those who oppose nuclear weapons rely on environmental concerns of the general public, such as the possibility of nuclear winter, to attack the need for large numbers of nuclear weapons. Added to the fear of nuclear winter are increasing concerns over the safety and reliability of the nuclear weapons production complex and of the weapons themselves.

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[94]Colin S. Gray, "The Nuclear Winter Thesis and U.S. Strategic Policy," *The Washington Quarterly*, Summer 1985, 85-98.

[95]Philip Romero, *Nuclear Winter: Implications for U.S. and Soviet Nuclear Strategy* (Washington D.C.: The Rand Corporation, P-7009, August 1984).

[96]J.J. Gertler, *Some Policy Implications of Nuclear Winter*, (Washington D.C.: The Rand Corporation, P-7045, January 1985).

B. THE STATE OF U.S. NUCLEAR WEAPONS PRODUCTION FACILITIES

Recently, increased environmental awareness and the end of Cold War tensions have brought public attention to a number of safety and environmental shortcomings at key U.S. nuclear weapons production facilities. With the revelations has come the almost complete shutdown of U.S. nuclear weapons production capabilities. According to Pat Towell,

> As a result of the new, tighter scrutiny, four reactors that produced nuclear material for weapons construction in 1986 have been closed --one of them permanently -- because of environmental, health or safety problems. Other plants that make key nuclear weapons components have been shut down at intervals for the same reasons.[97]

The Reed Report draws a similar picture of a suspended weapons building capability:

> Currently the U.S. is producing no plutonium or highly enriched uranium, nor does it have the capacity to fabricate (i.e., cast, machine, and otherwise shape) the plutonium it already has. [98]

Moreover, environmental concerns over the state of nuclear production facilities have made it easier for critics of nuclear weapons to challenge the continued need for nuclear weapons production. According to Pat Towell,

> liberal activists, who have opposed many weapons-production plants for arms control reasons, have seized on

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[97]Pat Towell, "Will Fear of Accidental Blasts Torpedo Activists' Plan?," *Congressional Quarterly Weekly Report*, 2 June 1990, 1733.

[98]Reed and Wheeler, *The Role of Nuclear Weapons in the New World Order*, 35.

the environmental issue as a lever to slow the government's weapons-making capability.[99]

U.S. nuclear weapons production facilities are in desperate need of modernization. Current production reactors are generally 35 to 50 years old. During the defense buildup of the late 1970s and early 1980s, the system showed definite signs of age. Pat Towell writes that "the defense buildup begun by President Jimmy Carter and accelerated by President Ronald Reagan imposed considerable strains on the aging weapons plants."[100]

In 1988, to relieve some of the pressure on the old weapons plants and in an effort to modernize, the Department of Energy proposed the construction of two new production reactors. One was to be built at the Savannah River site, while the other was to be built in Idaho. To date, however, no construction has begun on either plant. Moreover, "even some staunch backers of the weapons complex have doubts about the cost of a two-reactor plan -- projected to be $6.8 billion dollars."[101] The DOE also called for the construction of a third production facility that would use lasers to refine plutonium. According to Pat Towell,

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[99]Pat Towell, "Need For Massive Cleanup May Slow Weapon-Building," *Congressional Quarterly Weekly Report*, 20 January 1990, 178.

[100]Ibid., 179.

[101]Ibid., 183.

> Last year Congress approved only $40 million of the $150 million requested for the SIS [Special Isotope Separation] plant. And it barred work at the construction site until [Energy Secretary James] Watkins certified that the plant was essential for national security.[102]

In November 1991, the Department of Energy "postponed for at least two years its decision on how and where to build a new reactor to produce materials for nuclear bombs."[103] According to a statement issued by Secretary Watkins,

> This should in no way be seen as a decision not to build the new production reactor. On the contrary, this will insure a more deliberative decision, making the final decision more reflective of our newly defined defense needs and environmental concerns.[104]

One may, however, wonder about the prospects for a new production reactor in an era of increasing environmental awareness, decreasing faith in the legitimacy of nuclear deterrence, increasing cleanup costs, and decreasing availability of funds for military expenditures (including funds for nuclear weapons production facilities). Clearly, at least for the near term, the ability of the Department of Energy to build new nuclear weapons production facilities is in question. Probable technological advances in conventional weapons could conceivably make it more difficult to convince

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[102]Ibid., 183.

[103]John H. Cushman, Jr., "Energy Dept. Halts Decision On Building Nuclear Plant," *New York Times*, 2 November 1991, A10.

[104]Ibid.

the Congress and the American public of the need for such facilities in the long term.

Because of the lack of movement in the construction of new production reactors and the deteriorating state of existing tritium, the Department of Energy recognized something had to be done. Therefore, experts were not surprised that Energy Secretary Watkins chose to restart the K-reactor at the Savannah River plant. The attempted restart of the K-reactor in December 1991, however, only served to highlight the current ills of U.S. nuclear weapons production facilities.

1. The Restart of the Savannah River Plant

The Savannah River Plant "produces tritium and plutonium [and] recycles uranium."[105] The three reactors at the Savannah River Plant near Aiken, South Carolina, have been closed since 1988.[106] Because of the closure of "the country's sole source of tritium,"[107] there has been no production of tritium in the United States for almost four years. Tritium is an essential element of a nuclear warhead which boosts the explosive force of the weapon. It is important to realize that tritium decays. The Reed Report

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[105]Kenneth E. Jaques, "Status, Problems and Cleanup Costs Of U.S. Nuclear Weapons Plants," *Congressional Quarterly Weekly Report*, 20 January 1990, 181.

[106]Towell, "Need For Massive Cleanup May Slow Weapon-Building," 181.

[107]Keith Schneider, "Tainting by Tritium Found Near Weapons Plants," *New York Times*, 9 November, 1991, A7.

indicated that "The reopening of the K-reactor may resolve the problem of no tritium production."[108] According to Pat Towell,

> Because tritium decays at the rate of 5.5 percent annually, the tritium supplies in warheads must be replenished regularly. For a time, the Pentagon could keep most of its warheads charged with tritium by scavenging gas from less important weapons. But at some point, a significant number of U.S. warheads will begin losing their punch.[109]

Secretary of Energy James Watkins ordered the restart of the K-reactor on December 13, 1991,[110] to "begin a period of demonstration and testing . . . to show that it is possible to operate it safely and efficiently, restoring the supply of tritium."[111] During the startup of the reactor, however, 150 gallons of radioactive coolant water leaked into the Savannah River. "The leak went undetected for two days because the official in charge of authorizing transportation of water samples to a nearby laboratory was out with the flu."[112]

Problems such as the one that occurred in December 1991 are not uncommon at the Savannah Plant. "In 1987, for

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[108]Reed and Wheeler, *The Role of Nuclear Weapons in the New World Order*, 35.

[109]Towell, "Need For Massive Cleanup May Slow Weapon-Building," 179,182.

[110]Peter Applebome, "Anger Lingers After Leak at Atomic Site," *New York Times*, January 13, 1992, A7.

[111]Cushman, "Energy Dept. Halts Decision On Building Nuclear Plant," A10.

[112]Applebome, "Anger Lingers After Leak at Atomic Site," A7.

instance, a mistake by a maintenance worker released 172,400 curies of tritium at Savannah River, or nearly 18 grams of tritium, enough for roughly five nuclear weapons. . ."[113] Repeated leaks and an apparent lack of concern by both the companies managing the facility and the DOE have caused some residents of the area to call for the permanent shutdown of the facility.

At a hearing, one man said, "I'd like to see them shut down the plant for this reason: We have not used a nuclear weapon since World War II. We're not killing our enemies. We're killing ourselves."[114] Kevin Knoblock of the Union of Concerned Scientists said, "[w]e ought to stop fretting about where the next supply of tritium will come from and think instead of not needing it at all."[115]

Even if the Department of Energy decides not to reopen the Savannah River Plant, considerable expenditures in time and money will be required to clean up the waste problems of the facilities. Moreover, the managing staff of the facility faces severe credibility problems when it comes to its sincerity in dealing with environmental concerns of area residents. "One of the most disturbing disclosures is that

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[113]Schneider "Tainting by Tritium Found Near Weapons Plants," A7.

[114]Applebome "Anger Lingers After Leak at Atomic Site," A7.

[115]Ibid.

between 1955 and 1983 low-level nuclear waste from the plant was disposed of in cardboard boxes, dumped in shallow trenches and shoveled over."[116]

2. Cleanup Requirements for DOE Nuclear Weapons Production Facilities

The Savannah River Plant is not unique. All seventeen of the nuclear weapons plants of the Department of Energy face environmental cleanup and/or safety problems. Pat Towell described the Department of Energy's cleanup woes as follows:

> Operating in secret, and exempt from many safety precautions and waste disposal practices required of civilian industrial plants, the weapons complex has produced a mountain of toxic and radioactive waste, which, by the Energy Department's own estimate, will cost $150 billion to $200 billion over 30 years to clean up.[117]

The Department of Energy is faced with having to clean up its facilities before, or in conjunction with, their reopening. While previously the Department of Energy was able to violate hazardous materials laws with impunity, increasingly there are calls for the Department of Energy to be held to the same standards that apply to other manufacturers. Recently, in fact, the Environmental Protection Agency, frustrated with the progress in clean up, levied a $372,000 fine on the Department of Energy. DOE

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[116]Stephen Holden "Review/Film: A Turn for the Worse At the A-Bomb Factory," *New York Times*, October 12, 1990, Y16.

[117]Pat Towell, "Recruiting Defense Dollars For Environmental Duty," *Congressional Quarterly Weekly Report*, 7 July 1990, 2134.

refused to pay the fine, saying that the EPA lacked jurisdiction.[118] Moreover, since the Reagan administration a trend has developed of states willing to pressure the DOE into complying with environmental laws. "The Governors of Colorado and Idaho have threatened to enforce limits on amounts of toxic waste that could be stored, even at the risk of closing the weapons-production network."[119]

Many attempts by states to require the DOE to comply with existing federal and state environmental laws have been defeated by the DOE claiming the "'sovereign immunity' of the federal government against states' efforts to enforce their environmental regulations."[120] Efforts are underway in Congress, however, to waive the ability of the federal government to claim "sovereign immunity." "The U.S. House . . . overwhelmingly approved a bill (HR 1056) last July [1989] that would waive the 'sovereign immunity' of the federal government against states' efforts to enforce their environmental regulations."[121] The Senate has yet to pass a similar bill, but one has been introduced by Sen. George Mitchell (D. Maine). Nonetheless, it is apparent that the

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[118]Phillip A. Davis, "Rising Cleanup Costs," *Congressional Quarterly Weekly Report*, 6 April 1991, 852.

[119]Towell, "Need For Massive Cleanup May Slow Weapon-Building," 182.

[120]Ibid.

[121]Ibid.

nuclear weapons production complex is coming under increasing pressure to abide by environmental regulations from both within and outside the federal government.

Not only are there serious questions as to whether the United States will regain its ability to produce nuclear weapons, but recent reports have brought into question the safety of a number of current U.S. nuclear weapons. Revelations such as those that appeared in the 1990 Drell Report raise the question of whether environmental and safety risks will be perceived as justified by the current global political situation.

C. CONCERNS OVER THE SAFETY AND RELIABILITY OF CURRENT NUCLEAR WEAPONS

The safety of nuclear weapons has long been an important concern. In the 1950s many worried about the fate of nuclear weapons on airborne alert bombers. What has changed is that in the past most of the publicly expressed concerns for nuclear weapons safety came from outside of the government, whereas in 1990 the most prominent concerns over nuclear weapons safety originated from within the government. Just as in the case of the nuclear weapons production problems, the safety problems with many of the current weapons arose because of the past emphasis on getting the biggest "bang for the buck" with little, if any, regard for increased safety possibilities. As the Drell Report states,

> During this period [from the 1950s until the late 1980s], a large nuclear weapons stockpile was built in the chilling environment of the Cold War. Modernization and improvement programs gave priority to military requirements, such as achieving maximum yield-to-weight ratios for warheads and maximum payloads and ranges for missiles. Safety in general was not viewed with the same urgency . . . Modification of stockpile weapons in order to bring them up to modern safety criteria has proceeded slowly . . . As a result, in anticipation of acquiring new weapons systems, many older ones remain in today's nuclear stockpile that do not meet present nuclear weapons design criteria.[122]

One of the first signs of concern from within the nuclear weapons establishment came in May 1990 when, as Pat Towell reports, "[t]he directors of the Energy Department's three weapons laboratories recommended to the Senate Armed Services Subcommittee on Strategic Forces that the Pentagon remove from service 1,000-plus SRAM-A short range attack missiles carried by B-52 and B-1B bombers."[123] Fears began to mount that with respect to at least three types of nuclear warheads there was a great potential for accidental nuclear explosion. Fears grew when advanced mathematical analysis showed not only the possibility of large amounts of highly radioactive plutonium being scattered for miles, in the event of the chemical explosive detonating, but more importantly the possibility of an unintended nuclear explosion being set off by such an explosion. According to Pat Towell,

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[122]Sidney D. Drell, Chairman, John S. Foster, Jr., Charles H. Townes, *Report of The Panel On Nuclear Weapons Safety of the House Armed Services Committee*, December 1990, 11.

[123]Towell, "Will Fear of Accidental Blasts Torpedo Activists' Plan?," 1733.

> The first hint of a safety problem came . . . with the W-79 warhead used in the Army's 8-inch nuclear artillery shells. The warhead's high explosives could be detonated if a shell was dropped by its handlers or struck by a stray bullet. If such an incident occurred while the shell was loaded in a gun, some analysts warned, it might conceivably result in a nuclear blast.[124]

Arguably, the most important nuclear weapon system that was cited by a number of analysts as posing potential safety hazards was the new Trident II D-5 missile used to equip the most modern U.S. SSBNs. Not only were there questions about the warhead itself, but there were also questions about the design of the missile.

It must first be understood that a submarine-launched missile operates under a size constraint that a land-based missile does not. The Trident II D-5 missile was designed to achieve the greatest range and throw weight possible within the size constraints imposed upon it by being deployed within a submarine. When the missile was first designed, the decision was made to use traditional high explosive components instead of using new and safer insensitive explosive components. The decision to use the more volatile explosives was based on the fact that the new insensitive explosives weighed more than the older high-energy explosives. The Drell Report explains the tradeoff:

> In contrast to its safety advantages IHE contains, pound for pound, only about two-thirds the energy of HE and, therefore, is needed in a greater weight and volume for initiating the detonation of a nuclear warhead. Hence the

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[124]Ibid., 1734.

> yield-to-weight ratio decreases for a nuclear warhead when IHE replaces HE.[125]

Translated into layman's terms, if the warhead were constructed with IHE, it would be heavier, which would translate into shorter ranges for the missile.

The Drell Report, in light of safety concerns, made a number of recommendations to enhance the safety of key nuclear weapons. Recommendations included considering using insensitive high-explosives on all nuclear warheads and installing fire-resistant pits designed to stand up to the temperatures that would be encountered in an aircraft fire, and (where needed) designed to stand up to the higher temperatures that would be encountered in a missile propellent fire. Additionally, the Commission recommended switching to non-detonable propellants, especially with respect to the Trident II D-5 third stage.

The third stage of the Trident II D-5 missile is currently equipped with high-energy propellent that may detonate under certain circumstances. Because the third stage is surrounded by the bus that carries the nuclear warheads, there is the possibility of nuclear detonation in the event of a propellent detonation. The Report states:

> The D5 missile . . . is designed with a through-deck configuration in order to fit within the geometric constraints of the submarine hull and at the same time achieve maximum range with three boost stages. In this

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[125]Drell, *Report of The Panel On Nuclear Weapons Safety of the House Armed Services Committee*, 19.

> configuration the nuclear warheads are mounted on the post-boost vehicle (PBV) in a circular configuration around . . . the third stage motor. Thus if the third stage motor were to detonate in a submarine loading accident . . . a patch of motor fragments could impact . . . the side of the reentry bodies encasing each warhead. The concern is whether some combination of such off-axis multi-point impacts would detonate the HE surrounding the nuclear pit and lead to plutonium dispersal or possibly a nuclear yield.[126]

The report goes on to predict that in light of future reductions in the number of warheads that may be placed on the Trident II D-5 missile, the possibility exists for equipping the Trident II D-5 with "IHE, non-detonable 1.3 class propellent and a fire-resistant pit," and it then "could fly to even longer ranges than at present."[127]

D. PROSPECTS FOR THE FUTURE

Even if the federal government decides to spend the required money on nuclear weapons production facilities, the chances that local governments and citizens will accept the associated risks are uncertain. An example of the worsening problems for nuclear weapons production is the lawsuit that DOE recently settled. According to Phillip Davis,

> . . . nuclear bomb plants . . . -- once coveted for attendant jobs and salaries -- now evoke another image. It is one of pollution spewing into the air and hazardous wastes marring the nation's landscapes.
>
> Such ominous images were brought home by a Cincinnati federal court settlement in 1989. The Energy Department agreed to pay $73 million to residents near a nuclear

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[126]Ibid., 41-42.

[127]Ibid., 42.

> production plant in Fernald, Ohio, for emotional distress and impairment of property values.[128]

Additionally, the DOE faces a severe roadblock to restarting production at its nuclear facilities because of the lack of a storage site for radioactive waste materials.

On 5 October 1991, DOE announced that it would open the first permanent nuclear waste repository near Carlsbad, New Mexico. Energy Secretary Watkins bypassed Congressional approval by declaring the site ready to accept the first shipments of nuclear waste. Political leaders in Washington, D.C. and New Mexico strongly protested and vowed to initiate lawsuits in an attempt to stop the opening.[129] On 9 October 1991, the DOE was forced to delay the opening of the nuclear waste repository. According to Keith Schneider:

> Faced with a state lawsuit and growing political opposition in New Mexico, the United States Department of Energy today [9 October] postponed at least until the end of November the opening of the nation's first permanent nuclear repository.[130]

The importance of the waste repository is compounded by the fact that many of the weapons production plants are reaching their limits on the ability to temporarily store wastes.[131]

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[128]Davis, "Rising Cleanup Costs," 852.

[129]Keith Schneider, "U.S. Schedules Opening of Nuclear Waste Site," *New York Times*, 6 October 1991, A18.

[130]Keith Schneider, "U.S. Delays Opening of a Waste Site," *New York Times*, 10 October 1991, A19.

[131]See Towell, "Need For Massive Cleanup," 182, and Schneider, "U.S. Delays Opening," A19, column 3.

It seems that all over the West, state governments, concerned citizens, and American Indian groups are joining in an effort to stop nuclear wastes from being dumped in their states. On 26 November 1991, Federal District Court Judge John Garret Penn issued an injunction that barred the DOE from opening the nuclear repository, and on 31 January 1992 he ruled that DOE must seek Congressional approval along with New Mexico's before opening the repository.[132]

More important, however, may be DOE's announcement that it has postponed its decision on where and when to open a new nuclear weapons production plant, because of recent unilateral nuclear arms reductions.[133] "Arms control experts outside the Government say the declining number of warheads in the arsenal and the new supplies of tritium [tritium scavenged from retired nuclear weapons] make a new reactor unnecessary for decades."[134] A decision in 1993 or 1994 to build a new production facility would still take years to translate into a completed production facility, especially in light of the

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[132]See Keith Schneider, "U.S. Judge Bars Energy Secretary From Opening Nuclear Waste Repository," *New York Times*, 27 November 1991, A9. Idem, "Judge Halts Dump For Atomic Waste," *New York Times*, 28 November 1991, A10. Matthew L. Wald, "Judge Blocks Federal Plan to Open Plutonium Dump," *New York Times*, 4 February 1992, A7.

[133]Cushman, "Energy Dept. Halts Decision On Building Nuclear Plant," A10.

[134]Ibid.

legal fights that the federal government would certainly face in trying to open a new facility.

E. MILITARY LIABILITIES ASSOCIATED WITH NUCLEAR WEAPONS

In addition to the disincentives for continued reliance on nuclear weapons already discussed, there are military liabilities associated with nuclear weapons both during peacetime and wartime operations. Peacetime liabilities include added security needed for the guarding of the weapons and additional inspections and qualifications that are required of military personnel and units, along with the additional medical and psychological supervision of personnel assigned to billets that involve nuclear weapons.

The military also has to worry about electrical phenomena that are associated with nuclear weapons use. Among the best-known is the phenomenon called Electromagnetic Pulse (EMP). For years the military was aware of this phenomenon, but now with the widespread use of integrated circuits in military hardware, it has become a more pressing concern. EMP has a tendency to destroy integrated electric circuits. Therefore, the United States has had to spend additional billions of dollars on "hardening" weapons systems against the effects of EMP. EMP can disable both the attacker's and/or defender's military equipment. In a conflict with a non-nuclear power, however, the non-use of nuclear weapons by the United States

would ensure that none of its military equipment was disabled by accidental EMP.

Other practical military reasons exist to desire a more discriminate application of force. According to Paul Kozemchak,

> A military target can be destroyed in two ways: a large nuclear weapon can be dropped somewhere near it, or a much smaller weapon, in some cases a nonnuclear one, can be dropped directly on it. With the large weapon, the target may be destroyed, but much more of value might be damaged along with it. Some of these valuables might belong to friends. Some might in fact be friends or potential allies ... But with the smaller, more accurate weapon, we could destroy what we aim at and only what we aim at.[135]

The value of arguments such as Kozemchak's was not lost on the Soviets. Notra Trulock observed that "one clear implication the Soviets have drawn regards the promise of levels of destruction achieved through conventional fires that were formerly possible only through the employment of nuclear weapons. Particularly intriguing is the possibility of fulfilling damage criteria with a fairly high degree of confidence but without the collateral damage and operational complications inherent in nuclear strikes." [136]

In short, both the United States and the Soviet Union realized in the 1980s that any use of nuclear weapons might have greater costs than benefits to the attacker. These costs

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[135]Paul Kozemchak, "New Guidance for Nuclear and Nonnuclear Weapons," 262.

[136]Trulock, Hines, and Herr, *Soviet Military Thought in Transition*, 45.

could range from the moral and political liabilities to practical military liabilities.

An enlightening example of the military liabilities of using nuclear weapons near one's own forces or allied forces comes from the U.S. Army in the mid-1950's. In 1955 the Army tried to prove its tactics to fight in a nuclear environment through a series of tests involving Army personnel near nuclear detonations. As Andrew Bacevich writes:

> The most important was a well publicized operation called *Desert Rock VI* conducted at Yucca Flat, Nevada, and involving a composite armored force, *Task Force Razor*, positioned 3,000 meters (about two miles) from a 30-kiloton (30,000 tons of TNT) atomic device. When the device was detonated a choking dust and terrifying flash of light instantly filled the vehicles nearest to ground zero .... After the detonation the task force had advanced in a tight wedge formation to facilitate control- with every vehicle monitoring a single radio frequency and many turning on their lights to help in keeping station through the heavy dust thrown up by the blast. The Army had calibrated the shot to minimize any radiation hazard, hoping thereby to permit the armor to attack directly across ground zero. As it turned out, however, that when the lead elements reached a point 890 meters (a little over a half mile) from ground zero the radiation level inside the tanks had reached 10 roentgens per hour, forcing the commander to order a 90-degree turn away from the assigned objective.[137]

While these results may not seem unnecessarily restrictive on Army operations near nuclear detonations, the test was seriously flawed by the unrealistic conditions. Three times the test was postponed because the weather wasn't right. Each armored vehicle was placed in the right position days prior to the test, while thirty minutes prior to the explosion all the

[137]Andrew Bacevich, *The Pentomic Era*, 110-113.

armored vehicles turned their turrets away from the explosion and closed all hatches. All of these preparations were deemed by the Army to be "impossible in a combat situation."[138]

Not only does one have to face the problems associated with advancing toward the site of a nuclear explosion, but if friendly troops were near the explosion there would be a good likelihood of inflicting unwanted or unforeseen damage to those friendly forces. If advanced conventional weapons were used, instead of a nuclear weapon, the chances of inflicting casualties to friendly forces, as well as innocents, would be reduced significantly. Therefore, there would also be fewer political and moral liabilities. Moreover, since advanced conventional weapons would not have any radiation hazards associated with their use, the ground forces would be able to rapidly occupy the area struck if it were deemed necessary or advisable. Thus, solely for damage limitation purposes, it would be desirable to possess advanced conventional weapons to substitute for tactical nuclear weapons.

F. SUMMARY

The Panel on Nuclear Weapons Safety was able to make its recommendations for replacing, or modifying, existing nuclear weapons with safer weapons partly because of the fundamental changes in the global political climate. However, the panel

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[138]Ibid., 112.

made numerous recommendations that would be expensive to undertake. Replacing older nuclear weapons with newer, safer ones would be expensive, even if the number of weapons built to replace old ones was small. The cost of such a program would have to be borne in conjunction with the concurrent cost of cleaning up DOE nuclear facilities.

In light of recent trends in defense spending and the popular call for a "peace dividend", it seems unlikely that the United States will commit large sums to building new, or reopening old, nuclear production facilities. As it is, it could cost the federal government up to $300 billion to clean up existing nuclear weapons production facilities.[139] To expect Congress to authorize 6.8 billion dollars for new production facilities, before any notable movement on the cleanup of existing facilities has taken place, is probably wishful thinking.[140]

In light of the Department of Energy's past performance with its nuclear production facilities, it seems that the ability of the administration to convince Congress, individual states, and the American people that new production facilities would be safe may be dubious. Moreover, in the minds of a

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[139]Keith Schneider, "Scrapping Arms Raises Fears About Plutonium," *New York Times*, 26 February 1992, A8.

[140]Towell writes that "even some staunch backers of the weapons complex have doubts about the costs of a two-reactor plan [proposed by the Energy Department in 1988] -- projected to be $6.8 billion. Towell, "Need for a Massive Cleanup," 183.

number of average citizens "nuclear winter" may still be a very real possibility, if not a probability, in the event of nuclear war. Thus, with the performance of advanced conventional weapons in Desert Storm in 1991 and conceivable improvements in advanced conventional weapons capabilities over the next few decades, public sentiments questioning the need for (a) new nuclear weapons and (b) production facilities for the production of critical components of existing nuclear weapons can be expected to increase. In addition, President Carter's January 1977 call for "the elimination of all nuclear weapons from this Earth,"[141] and President Reagan's March 1983 SDI speech along with recent moves by President Bush drastically cutting the American nuclear arsenal have probably increased the public's reservations about the desirability, or need, for nuclear weapons. Thus, while Secretary Watkins insists that the construction of a new weapons reactor will eventually begin, the possibility exists of losing the industrial base, not only to produce new nuclear weapons, but also to maintain existing weapons. If the construction of the new production reactor is postponed long enough, and political and military officials continue to develop non-nuclear strike systems that reduce America's military-technical dependence on nuclear weapons, Congress and the public at large may

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[141]U.S., Presidents, *Public Papers of the Presidents of the United States* (Washington, D.C.: Office of the *Federal Register*, National Archives and Records Service, 1977), Jimmy Carter, 1977, 3.

eventually disbelieve claims of residual needs for nuclear weapons capabilities.

IV. THE STRATEGIC IMPLICATIONS OF ADVANCED CONVENTIONAL WEAPONS: THE EMERGING THREAT AND "CONVENTIONAL DETERRENCE"

The previous two chapters highlighted a number of disadvantages associated with nuclear weapons. The disadvantages include the declining political utility of nuclear weapons along with the prospect of possible future U.S. nuclear weapons scarcity. These disadvantages, along with the advantages that advanced conventional weapons offer, are incentives for further research, development, and deployment of advanced conventional weapons to accomplish missions currently assigned to nuclear weapons. "The conventional wisdom is, in short, that stronger conventional forces are needed to enhance conventional deterrence and thus compensate for the declining effectiveness of nuclear deterrence."[142] The full range of advantages that advanced conventional weapons can offer, however, will not be realized until the government makes a conscious decision to pursue additional types of strategic conventional weapons.[143] Available

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[142]Samuel P. Huntington, "Conventional Deterrence and Conventional Retaliation in Europe," *International Security*, Winter 1983-84, 34.

[143]The term strategic has become synonymous in the U.S. with nuclear. However, the term "strategic conventional weapons" refers to weapons that can strike targets deep within the territory of an adversary that are deemed vital to the conduct of the enemy's war plan. Targets might include, but are not limited to: command, control, communication, and

technology would allow conventional weapons to strike a broader range of strategic targets. "More precise, discriminate, and controllable weapons," as Paul Kozemchak writes, "will not be designed and built in the absence of a U.S. policy to that end."[144] This chapter examines the implications of a greater reliance on "conventional deterrence" in light of the new global security environment. It concludes that it is imperative that U.S. policy encourage the further research, development, and deployment of strategic conventional weapons and rely more heavily on strategic conventional capabilities to deter potential adversaries.

Why would anyone call for a greater reliance on conventional deterrence in light of almost fifty years of apparently successful nuclear deterrence? The answer is that "conventional deterrence" capabilities offer benefits in the areas of damage limitation and escalation control and more credible policy alternatives for regional military actions, particularly in the light of recent global political and military changes.

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intelligence (C^3I) cites, strategic military assets (e.g., airfields, ammunition depots, nuclear weapons sites), or military and political leaders.

[144]Kozemchak, "New Guidance for Nuclear and Nonnuclear Weapons," 262.

A. THE TRADITIONAL SCENARIO

Over the past forty years, American nuclear strategists have been almost wholly concerned with deterrence, crisis stability and escalation control with regard to a American/Soviet confrontation. Many claimed that after the Soviets acquired nuclear weapons it was no longer credible to make threats with American strategic nuclear forces for the protection of Europe. It was deemed a reliance on a suicidal threat. Tactical nuclear weapons were therefore introduced to Europe, in the hope of reinforcing a credible threat of nuclear escalation and avoiding a suicidal use of nuclear weapons. Thus, it was hoped that a measure of escalation control was inherent in "smaller" and more "discriminate" nuclear weapons.

While tactical nuclear weapons were perceived as more discriminate and less likely to be used on the territory of either of the two superpowers, many claimed that the use of nuclear weapons, no matter how discriminate, against either superpower's forces would invite escalation to a higher level of potential violence.[145] What was needed, according to many analysts, was to increase the conventional ability to deter attack. Then, it was believed, the nuclear threshold would not be crossed and the resultant likelihood of escalation would be

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[145]See Paul Nitze, "The Relationship of Strategic and Theater Nuclear Forces," *International Security*, Fall 1977, 122-132.

decreased. President Reagan echoed these sentiments when he called on the United States:

> to take steps to reduce the risk of a conventional military conflict escalating to a nuclear war by improving our non-nuclear capabilities. America does possess-now-the technologies to attain a very significant improvements in the effectiveness of our conventional, non-nuclear forces. Proceeding boldly with these new technologies, we can significantly reduce any incentive that the Soviet Union may have to threaten attack against the United States and its allies.[146]

The response to this challenge involved applying technology to moving "weapons of perceived disutility, that is, weapons whose effects are sometimes indiscriminate, into the region of perceived utility, that is, where the effect is more discriminate."[147] As a result, a premium has been placed "on autonomous, long-range standoff weapons as well as continuous, all-weather surveillance and reconnaissance."[148] Paul Kozemchak's view of the potential contributions of advanced conventional weapons in defending Europe is noteworthy:

> The technologies of precision and discrimination can strengthen U.S. guarantees to allies. The United States can decrease its reliance on incredible, apocalyptic bluffs while increasing the number of limited, nonsuicidal

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[146]U.S. President, *Public Papers of the Presidents of the United States* (Washington, D.C.: Office of the *Federal Register*, National Archives and Records Service, 1983), Ronald Reagan, address to the nation, March 23, 1983, 443.

[147]Thomas Welch, "Technology Change and Security," *The Washington Quarterly*, Spring 1990, 114.

[148]Joseph Pilat and Paul White, "Technology and Strategy in a Changing World," *The Washington Quarterly*, Spring 1990, 82.

> U.S. and NATO responses to attack. The United States can also increase the price that the aggressor must pay to meet its attack objectives. Because the attacker's preparations would be greater, U.S. warning would be increased, and the cost to NATO to respond to ambiguous warning would be less.[149]

While Europe will continue to play a major role in U.S. military planning, non-European conflicts will increasingly become more important to military planning. According to Chuck Vollmer,

> As the likelihood of superpower conflict in Europe recedes and the arms control process gains momentum, it is important to remember that our world has not become an intrinsically more peaceful one.[150]

Advanced conventional weapons offer a more credible deterrence threat against non-nuclear regional powers, and one more in keeping with the American way of war, than nuclear weapons, whether tactical or strategic. Moreover, even against a power that has developed, or is developing, weapons of mass destruction, non-nuclear responses would be preferred if they are deemed to be sufficient to respond to the threat.

B. DETERRENCE THEORY

Traditional deterrence theory predicts that a challenger will not be deterred if he expects the probable benefits of military action to outweigh the probable costs. On the other

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[149]Kozemchak, "New Guidance for Nuclear and Nonnuclear Weapons," 266.

[150]C. D. Vollmer, "The Future Defense Industrial Environment," *The Washington Quarterly*, Spring 1990, 102.

hand, deterrence theory predicts that a challenger will be deterred if the probable costs of military action outweigh the probable benefits. According to Stein,

> In its essence, the theory of deterrence is one of motivation, but motivation of a singular kind. It asserts that would-be challengers seek an opportunity to make gains, that they look for "windows of vulnerability," and that, when they find them open, they jump through. Only a credible capacity to deny or punish militarily, to inflict costs and risks at an unacceptable level, only military windows that are closed, can dissuade an adversary from attack.[151]

Central to the challenger's "cost versus benefits" estimates is the credibility of the defender's capability and commitment to defend against the challenger's military actions and/or punish the challenger for military actions. Stein writes,

> Crucial to a challenger's estimates is the credibility of a defender's commitment to punish or deny. . . . Credibility, in turn, is generally a function of the challenger's estimate of a defender's capability and resolve.[152]

The credibility of the commitment of the defender to defend is signaled by the defender's forces for active defense - i.e., to intercept attacks. The credibility of the commitment to punish, however, comes from the capability of the defender's weapons to strike strategic targets deep in the territory of the challenger and the challenger's perceptions of the

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[151]Janice Gross Stein, "Extended Deterrence in the Middle East: American Strategy Reconsidered," *World Politics*, April 1987, 329.

[152]Ibid.

likelihood that the defender would resort to punishing weapons. In order to achieve a more complete picture of a potential challenger's "cost versus benefits" calculation, the latter capability may well be more important than the former. According to Huntington,

> Unlike deterrence by presence or deterrence by defense, however, this form of deterrence [deterrence by retaliation or punishment][153] is not effective simply because the requisite military capabilities exist; it requires a conscious choice by the defender to retaliate; and hence the aggressor has to calculate not only the defender's capabilities to implement a retaliatory threat but also the credibility of the threat.[154]

If, as according to deterrence theory, credibility plays a central role in the challenger's estimates, one must ask how the non-use of nuclear weapons since 1945 and the lack of overt nuclear threats against any nation other than the Soviet Union since the Eisenhower administration have affected the perceived credibility of American nuclear threats. One could

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[153]"Military forces can contribute to deterrence in three ways. First, they may deter by simply being in place and thus increasing the uncertainties and potential costs to an aggressor, even though they could not mount an effective defense [i.e., deterrence by presence]. . . . Second, military forces can deter by raising the possibility of successful defense and hence forcing the aggressor to risk defeat in his effort or to pay additional costs for success [i.e., deterrence by defense or by denial]. . . . Third, military forces can deter by threatening retaliation against assets highly valued by the potential aggressor [i.e., deterrence by retaliation or punishment]. This, of course, has been the classic role of strategic nuclear forces." Huntington, "Conventional Deterrence and Conventional Retaliation in Europe," 35-36.

[154]Huntington, "Conventional Deterrence and Conventional Retaliation in Europe," 36.

conclude that a leader of an enemy power might consider the U.S. nuclear arsenal an unusable threat.

1. Extended Versus Direct Deterrence

A number of types of deterrence are possible. Here we will examine the distinction between extended deterrence and direct deterrence. Huth and Russett write that "[t]he defender may threaten military retaliation so as to prevent attack on his own homeland territory (direct deterrence), or against a third state or piece of territory (extended deterrence)."[155]

While the U.S./Soviet Cold War confrontation did include extended deterrence policies, with U.S. commitments to protect NATO Europe, Japan, Korea and other countries, direct deterrence was *concurrently* taking place for most of the Cold War. During the Eisenhower administration, a period of overwhelming U.S. nuclear superiority, the United States threatened "massive retaliation" in response to a conventional Soviet attack. Such threats were deemed necessary because of the overwhelming superiority that the Soviet Union possessed in the conventional arena. With the increasingly large Soviet nuclear arsenal, however, "massive retaliation" was replaced by "flexible response." According to Kugler and Zagare, "[t]his new deterrence stance [flexible response] postulated

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[155]Paul Huth and Bruce Russett, "Testing Deterrence Theory Rigor Makes a Difference," *World Politics*, July 1990, 474.

restraint in nonnuclear confrontations and restated the need to retaliate in kind to a nuclear attack."[156]

In currently conceivable regional conflicts few potential challengers to the United States will possess either conventional superiority over the United States, or nuclear weapons, much less nuclear weapons with sufficient range to threaten the United States directly. (Any nuclear power could conceivably smuggle nuclear weapons into the United States. The ability for extended-range delivery of nuclear weapons - e.g., cruise or ballistic missiles - will nonetheless continue to be held by relatively few states.) It is more likely that a challenger will threaten an ally of the United States, or a region vital to U.S. irterests. Thus, it appears that most cases of deterrence that the United States will face for the foreseeable future (ten to fifteen years) will be cases of extended deterrence. Furthermore, because most potential challengers will not possess conventional superiority or nuclear weapons, the principles of proportionality and discrimination (and other political and strategic considerations) will restrain the United States from threatening nuclear responses against non-nuclear challengers because of the perceived probable outcomes of nuclear weapons strikes.

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[156]Jacek Kugler and Frank C. Zagare, eds., *Exploring the Stability of Deterrence* (Boulder, CO: Lynne Rienner Publishers, 1987), 2.

Thus, in light of the disintegration of the Soviet Union, and the rise in potential regional conflicts that the United States will be concerned with, one must ask if the deterrent effect of nuclear weapons will play a significant role in regional conflicts. For, as Eliot Cohen has observed, "[i]t would be a terrible mistake to think that the elaborate and arid logic of nuclear deterrence that operated between the superpowers will continue to hold elsewhere."[157]

It must be assumed that U.S. public opinion (at least the elite and informed public) would pressure the government to adhere to the principles of proportionality and discrimination. A good description of the principles of proportionality and discrimination appears in *The Challenge of Peace*. According to the National Conference of Catholic Bishops,

> Response to aggression must not exceed the nature of the aggression. . . . Moreover, the lives of innocent persons may never be taken directly, regardless of the purpose alleged for doing so. To wage truly "total" war is by definition to take huge numbers of innocent lives. Just response to aggression must be discriminate; it must be directed against unjust aggressors, not against innocent people caught up in a war not of their own making.[158]

The Persian Gulf War is illustrative of the restraint that has governed Western planning. Some top U.S. officials

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[157]Eliot Cohen, "The Future of Force and American Strategy," *The National Interest*, Fall 1990, 4.

[158]The National Conference of Catholic Bishops, *The Challenge of Peace God's Promise and Our Response*, a Pastoral Letter on War and Peace, 3 May 1983, 46.

made ambiguous remarks declining to rule out the possible use of nuclear weapons against Iraqi forces in retaliation for chemical or biological weapons use. It appears, however, that the use of nuclear weapons was in fact ruled out. The decision not to use nuclear weapons was publicly acknowledged by some senior U.S. officials. The officials said, "[t]he decision not to use 'weapons of mass destruction' in the Middle East crisis reflects high confidence in the overwhelming firepower of U.S. conventional forces, plus a desire not to compound the already unpredictable political consequences of a potential military conflict."[159] And a senior military official, speaking on condition of anonymity, replied to the moral comparison of Truman's decision to use nuclear weapons to end World War II, replied as follows:

> The world is a more complicated place now, and the consequences of using tactical nukes -- some of which are unpredictable -- outweigh their military utility.[160]

The most overt pledge not to use nuclear weapons in the Gulf War came from President Mitterrand of France. He stated that the coalition "must not use chemical weapons. We have a conventional means that will permit us to defend ourselves and to make law triumph, but we must not succumb to this will to reply on the same level . . . I exclude it. Neither chemical,

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[159]R. Jeffrey Smith and Rick Atkinson, "U.S. Rules Out Gulf Use of Nuclear, Chemical Arms," *Washington Post*, 7 January 1991, A1.

[160]Ibid, A22.

nor bacteriological, nor nuclear arms . . . to use arms of these types would be a retreat towards barbarism that I refuse."[161] Clearly, none of the Western coalition members believed that nuclear weapons use was either needed or beneficial. Thus, the West, and the United States in particular, showed once again its reluctance to use nuclear weapons.

It must be assumed that potential adversaries of the United States recognize the American public's desire to adhere to the principles of proportionality and discrimination. Such adversaries probably also recognize that the United States has long refrained from threatening nuclear weapons use against non-nuclear powers. Clearly, in light of political *inhibitions in the United States* against unnecessary collateral damage and the absence of historical cases since the Eisenhower administration of the U.S. threatening non-nuclear nations with nuclear weapons use, leaders of emerging regional powers could be expected to consider American nuclear threats incredible. In view of the discriminate nature of advanced conventional weapons, and the recent example of effective use of advanced conventional weapons in Operation Desert Storm, advanced conventional weapons can fulfill the principles of proportionality and discrimination and thus make their threatened use credible to potential challengers.

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[161]Francois Mitterrand, 7 February 1991, in *Le Monde*, 9 February 1991, 8-9.

In other words, it is probable that the United States would refrain from nuclear weapons use because of the moral implications of killing innocents. The proven capability of advanced conventional weapons (with their effectiveness recently demonstrated in the Gulf War) and the ability of the United States to employ those weapons with relatively little negative response internationally or domestically reinforce their deterrent value. Paul Kozemchak writes:

> The West can end the balance of terror if it chooses. Advances in the technologies of precision, discrimination, and control mean the West can choose not to rely on the incredible threat of indiscriminate destruction of innocent civilians to deter war. The West can choose a strategy that protects and defends its values, not one that is at odds with them.[162]

2. Past Failures of Conventional Deterrence and So-Called "Nuclear Deterrence Successes"

Many analysts point to past failures of "conventional deterrence" as evidence for the relatively low utility of it. Huntington writes,

> In the past, conventional deterrence has usually meant deterrence by denial, and the frequency of wars in history suggests that this conventional-denial deterrence was not effective. Nor has it been effective in the modern era. . . . John Mearsheimer identified twelve major instances of conventional deterrence between 1938 and 1979. In two of these cases, deterrence worked; in ten, deterrence failed.[163]This 83.7 percent failure rate for deterrence by conventional defense after 1938 contrasts rather

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[162]Kozemchak, "New Guidance for Nuclear and Nonnuclear Weapons," 261.

[163]John J. Mearsheimer, *Conventional Deterrence* (Ithaca, NY: Cornell University Press, 1983) 19-20.

> markedly with the zero failure rate for deterrence by nuclear retaliation for a quarter century after 1945.[164]

One must note, however, that it is difficult to determine when deterrence (conventional or nuclear) actually works. According to Lebow and Stein, "problems are particularly acute in testing theories of deterrence because of the difficulties inherent in identifying deterrence successes, which leave few if any behavioral traces, and of inferring the intentions of would-be challengers."[165]

Furthermore, one must question if nuclear weapons possession automatically translates into credible deterrence. Does the possession of nuclear weapons alone deter attack by non-nuclear states on vital interests of nuclear states, or the nuclear state itself? The answer seems to be "no." China attacked U.S. forces in Korea. Iraq fired Scud missiles against Israel, a state considered to be a nuclear power.

While the United States was not threatened with its own annihilation when trying to deter a non-nuclear aggressor (i.e., China during the Korean War), many self-inhibiting factors existed, such as the desire to keep collateral damage to a minimum and the fear of crossing the nuclear threshold,

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[164]Huntington, "Conventional Deterrence and Conventional Retaliation in Europe," 38.

[165]Richard Ned Lebow and Janice Gross Stein, "Deterrence: The Elusive Dependent Variable," *World Politics*, April 1990, 336. They also reclassify a number of possible deterrence cases that Huth and Russet classified; Lebow and Stein do not come up with one case involving a nuclear power that they classify as a deterrence success.

that restrained the United States from initiating nuclear weapons attacks. Therefore, the United States could not bring effective retaliatory weapons to bear on the enemy.[166] These "self-inhibiting" factors presumably are well known to potential adversaries of the United States. U.S. nuclear threats, except under the most extreme circumstances, presumably would be considered incredible by many potential adversaries. During Operation Desert Storm, however, highly effective and discriminate extended-range conventional weapons, such as the Tomahawk (TLAM) cruise missile and the Standoff Land Attack Missile (a variant of the Harpoon with a published range of 100 Km[167]), were used to attack the Iraqi military and political apparatus.

3. Escalation Control

Most, if not all, American policy-makers would rather respond to crises with nonnuclear alternatives, in order to avoid crossing the nuclear threshold. The belief is that in this way the United States might avoid escalation to nuclear weapons employment. "The nuclear threshold is widely seen as

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[166]During the Vietnam War the popular perception that American bombing campaigns were indiscriminate caused the Johnson Administration to refrain from bombing Hanoi where many of the most important political and military targets existed. See Clodfelter, "Restraints and results 1965-68," in *The Limits of Air Power,* 117-146.

[167]Duncan Lennox and Arthur Rees, eds., *Jane's Air-Launched Weapons,* (Surrey, U.K.: Jane's Information Group, 1989), update edition 7, under Harpoon/USA.

very important. To cross the threshold by initiating the first use of nuclear weapons would be a salient and difficult decision."[168] Against a nuclear adversary the crossing of the nuclear threshold would be considered even more serious. In a confrontation with a nuclear power, advanced conventional weapons strikes could be used, while retaining the ultimate threat of U.S. nuclear response. Thus, advanced conventional weapons offer a highly effective rung on the escalation ladder short of nuclear war.

Some would argue that the use of nuclear threats against non-nuclear powers would encourage these non-nuclear powers and others to seek their own nuclear forces. If, however, the United States did not rely on nuclear threats against non-nuclear powers, the belief is that there might be less incentive for non-nuclear powers to pursue their own nuclear capability. Such was the reasoning behind the U.S. pledge, in 1978, not to use nuclear weapons against non-nuclear powers who had signed the NPT or any comparable internationally binding commitment.[169]

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[168]Stuart Croft, "Military Technology Innovation and Stability," *Futures*, October 1989, 472.

[169]See Cyrus Vance, statement to the U.N. Special Session on Disarmament, 12 June 1978 cited in United States Arms Control and Disarmament Agency, *Arms Control and Disarmament Agreements*, 1982 edition, 87. (see footnote 68)

C. CONVENTIONAL DETERRENCE

In the past few decades a number of analysts have written on conventional deterrence. For the most part these analysts concluded that reliance on conventional deterrence was foolhardy. As Richard Betts wrote, "I accept the case for improving conventional options, but challenge reliance on conventional deterrence."[170] It is important to note that almost all the authors who took this position were considering conventional deterrence vis-a-vis the Soviet Union. Furthermore, analysts such as Betts and Mearsheimer[171] viewed attempts at increased conventional deterrence only in light of Western attempts to increase NATO's conventional defensive capabilities. In other words, those analysts assumed only improvements in the ability to deter through defense or to deter by presence.[172] Nuclear deterrence, though, also is based on deterrence through the threat of retaliation. With the improvements in precision, range, discrimination, and destructive effectiveness that new advanced conventional

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[170]Richard Betts, "Conventional Deterrence: Predictive Uncertainty and Policy Confidence," *World Politics*, January 1985, 154.

[171]Mearsheimer doesn't even consider "Long-range [Precision Guided Munitions] PGMs such as the cruise missile that can strike important targets in an opponent's rear. . ." His sole emphasis is on tactical battlefield weapons, such as anti-tank weapons. John Mearsheimer, *Conventional Deterrence*, (Ithaca, NY: Cornell University Press, 1983), 190. (See also footnote 152.)

[172]See footnote 151.

weapons offer, conventional deterrence too can rely on the threat of retaliation or deterrence by punishment. According to Huntington,

> Deterrence without retaliation is weak; retaliation through escalation [to the use of nuclear weapons] is risky. Conventional retaliation strengthens the one without risking the other.[173]

Many who warn against reliance on conventional deterrence argue that while the capability of conventional weapons has increased it is not capability that plays the significant role in determining the deterrent effect of a weapon. Betts argues that:

> Much analysis of conventional deterrence is purely military in content, based on capabilities. Whether given capabilities deter, tempt, or provoke attack is highly dependent on political factors-especially the nature of the potential attacker's motives and beliefs. Depending on those factors, increased NATO capabilities could be superfluous, sufficient, or counterproductive to deterrence.[174]

Betts, however, misses the whole point of his own argument; increased conventional capabilities could also strengthen deterrence. Just as the attacker's beliefs and motives can cause increased conventional capabilities to be superfluous or counterproductive, the potential attacker's motives and beliefs can cause nuclear deterrence to be of very little use, especially if the potential attacker believes that

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[173]Huntington, "Conventional Deterrence and Conventional Retaliation in Europe," 41.

[174]Betts, "Conventional Deterrence: Predictive Uncertainty and Policy Confidence," 154.

U.S. interests are not sufficient to warrant nuclear weapons use. While many analysts point to the awesome destructive power of nuclear weapons as a psychological factor making nuclear weapons of greater utility than conventional forces in deterring an opponent, the fact that nuclear weapons are perceived as so destructive may cause the United States to refrain from their use, and cause many potential adversaries to look at nuclear threats as incredible. Thus, as William Perry notes,

> This new conventional military capability adds a powerful dimension to the ability of the United States to deter war. While it is certainly not as powerful as nuclear weapons, it is a more credible deterrent, particularly in regional conflicts vital to U.S. national interests.[175]

Why is the new U.S. conventional capability a more credible deterrent? Nuclear threats have lost credibility, while there has been a fundamental change in the capability of advanced conventional weapons to strike strategic targets deep in an enemy's territory and offer a probability of kill comparable to a nuclear weapon. Conventional weapons are, also, more politically and militarily useable because of their greater discrimination and damage-limitation as well as their perceived ability to contribute to escalation control. Edward Rhodes writes that

> successful deterrence requires coercive power. . . .[and] there are two necessary conditions for the existence of

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[175]William Perry, "Desert Storm and Deterrence," *Foreign Affairs*, Fall 1991, 67.

> coercive power;. . . *first, the opponent must be coercible. . . .second, for coercive power to exist the coercer must have the capacity credibly to commit himself to the effective coercive strategy.*[176]

In view of the U.S. history of non-use of nuclear weapons in Korea, Vietnam and the Middle East, and the stated U.S. policy of not using nuclear weapons against non-nuclear nations under certain conditions, many potential adversaries may well not perceive American nuclear options as credible threats. Furthermore, the success of conventional attacks in Desert Storm, especially extended-range weapons, may cause future adversaries to be more fearful of conventional strikes. One must remember that an adversary is deterred by his risk assessment.[177]

The Carter Administration came to the conclusion that what would deter the Soviet Union was not necessarily the same as what would deter the United States. The Carter administration introduced the "countervailing strategy." The Reagan administration continued to rely on the "countervailing

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[176]Edward Rhodes, *Power and MADness* (New York: Columbia University Press, 1989), 83-85, emphasis in the original.

[177]Some leaders may not take military capability or credibility into account according to the criteria favored by those who would deter them. These leaders, then, would not be deterred by nuclear weapons or advanced conventional weapons. According to Stein "Leaders who expect an unfavorable change in relative capabilities, who fear an attack by others, or who are unable to absorb a first strike, may decide to use force even though they see no 'opportunity;' . . . they estimate the cost of inaction as unacceptable. . . . Under these circumstances, the action of the defender may well be irrelevant." Stein, "Extended Deterrence," 330.

strategy." Secretary of Defense Casper Weinberger - Secretary of Defense during most of the Reagan administration (until November 1987) - defined the strategy as "the threat to destroy what the Soviet leadership values most highly: namely, itself, its military power and political control capabilities, and its industrial ability to wage war."[178] Many argue that Third World leaders also value themselves and military power. The theory of omni-balancing suggests that Third World leaders value themselves and their military power and political control, even to the exclusion of their people.[179] If the theory is right, advanced conventional weapons must be capable of attacking an emerging power's leaders, military power, and political apparatus. To be credible, though, the challenger must view the likelihood of U.S military use of such weapons against its leaders, military power, and political apparatus as probable. Only if these two conditions are met can a weapon be considered effective as a deterrent threat. Thus, if advanced conventional weapons offer both the capability to threaten the leadership and military and do so in a credible manner, they would have to be seen as effective deterrent threats.

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[178]Casper Weinberger, *Department of Defense Annual Report for FY 1987*, 75, cited in Scott Sagan, *Moving Targets*, (Princeton, NJ: Princeton University Press, 1989), 13.

[179]For a further discussion of the Omni-balancing theory see Steven David, "Explaining Third World Alignment," *World Politics*, January 1991, 233-256.

D. SUMMARY

Nuclear deterrence has declined in utility. It is therefore necessary for the United States to develop weapons that enhance conventional deterrence. Since advanced conventional weapons are more politically and morally usable than nuclear weapons, they potentially offer greater deterrence capability than do nuclear weapons, at least in regional conflicts that do not involve nuclear powers. Advanced conventional weapons are politically and morally more usable because they offer relatively high assurance of lower American casualties, do not cross the nuclear threshold, and limit damage to noncombatants of the opposing nation. In other words, they satisfy the principles of proportionality and discrimination, while also lessening the chances for American casualties. The greater usability of advanced conventional weapons and the increased capability of these weapons mean that "conventional deterrence" can, and will, play a significant role in potential confrontations with both non-nuclear and nuclear powers.

V. CAPABILITIES AND LIMITATIONS OF ADVANCED CONVENTIONAL WEAPONS

Since 1945, strategic conflict has become synonymous with nuclear conflict. In the past conventional forces were unable to quickly strike targets deep within the enemy's territory with sufficiently high levels of assurance of destruction. With advances in accuracy relatively small conventional warheads may be used to perform many of the missions - including strategic missions - previously reserved for nuclear weapons. With the disincentives the United States faces with respect to continued heavy reliance on strategic nuclear weapons, and the marked improvements in conventional weapons technologies, it has become increasingly apparent that the United States can and should increase its reliance on non-nuclear strategic weapons. According to Carl Builder,

> the incentives and opportunities for nonnuclear weaponry are neither limited in range nor measured in kilometers. In the next decade or two, it will become increasingly apparent that nonnuclear weaponry can and should be used in some of the major military roles now served by strategic nuclear forces.[180]

For advanced conventional weapons to be assigned to strategic missions they will have to be able to strike a wide range of strategic targets that nuclear weapons are currently

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[180]Carl Builder, *Strategic Conflict Without Nuclear Weapons*, (Santa Monica, CA: The Rand Corporation, April 1983) R-2980-FF/RC, v.

assigned to. Therefore, one must determine (a) whether it is technically possible to attack a wide range of strategic targets with advanced conventional weapons (can an effective conventional warhead be built that would destroy many strategic targets?), (b)whether it would be militarily feasible to conduct a strategic campaign with advanced conventional weapons (can a conventional weapon be built within size, and range restraints to deal with a significant amount of strategic targets?), and (c) whether it is economically feasible to develop advanced conventional weapons for strategic missions.

This chapter examines the feasibility of using advanced conventional weapons for strategic missions. Possible strategic missions for advanced conventional weapons are examined, as well as missions that are not realistic potential targets for advanced conventional weapons. Probable costs of potential advanced conventional weapons versus known costs of nuclear and conventional alternatives are also examined.

This chapter does not attempt to conduct a comprehensive analysis of strategic targets suitable for advanced conventional weapons. The precise accuracies of current weapons systems, as well as the potential accuracies of emerging technologies, are generally well kept secrets. Thus, it is impossible to comprehensively survey the destructive possibilities of advanced conventional weapons and the

vulnerabilities of strategic targets in this forum. Categories of target types vulnerable to advanced conventional weapons are discussed, however.

A. TECHNICAL FEASIBILITY

The technical feasibility of advanced conventional weapons to conduct strategic missions depends on (1) whether any strategic targets are susceptible to nonnuclear attack, and (2) whether long-range nonnuclear weapons can be developed that would be able to successfully strike those targets. It seems logical that any man-made structure could be destroyed if sufficient force were brought to bear on it. As Carl Builder writes, "[m]ost man-made objects are susceptible to destruction with a properly placed projectile or explosive charge. It is only when the destructive device cannot be properly placed that massing their effects by means of rapid-fire guns or large warheads, including atomic warheads, becomes attractive."[181] The destruction of hardened concrete targets during Operation Desert Storm with conventional munitions demonstrates that Builder is correct.[182]

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[181]Carl Builder, *The Prospects and Implications of Non-Nuclear Means for Strategic Conflict*, Adelphi Paper No. 200 (London: The International Institute for Strategic Studies, 1985), 10.

[182]For examples of conventional munitions use for the destruction of hardened concrete targets see *Conduct of the Persian Gulf Conflict*, An Interim Report to Congress, 1991. (See especially "Offensive Counterair," 6-2, and "Service Rapid Acquisition," 8-1.)

In the past the relative inaccuracy of weapons meant that only large nuclear warheads could offer significant assurance of destruction. Since ballistic and cruise missiles were the most survivable way to deliver large yield warheads[183] at long range, they were regarded as the primary strategic weapons. With the increase in accuracy, however, a relatively small warhead can destroy the same target that a larger but less accurate weapon could destroy. Ample evidence demonstrates the ability of non-nuclear weapons to destroy strategic targets with the same level of confidence that nuclear weapons offer. The destructive potential of specific types of non-nuclear weapons may be greater than that of nuclear weapons against some targets. Deep underground targets, however, may be well beyond the destructive capability of non-nuclear weapons. Destroying deep underground targets with current nuclear weapons may also be prohibitively difficult.[184] Above ground hardened targets may, however, be more efficiently destroyed using nonnuclear weapons. According to Builder,

> While reinforced concrete is highly resistant to large distributed loads, such as the air pressures created by a nearby explosion, it is quite susceptible to penetration by devices which concentrate and direct their energy into the concrete, such as hypervelocity projectiles and

[183]Nuclear warheads generally have much greater explosive force, in comparison to conventional warheads, relative to the weight of the warhead.

[184]See Kozemchak, "New Guidance for Nuclear and Nonnuclear Weapons," 273.

shaped-charge explosives. An 800-kg shaped charge may be sufficient to penetrate ten meters of concrete.[185]

It would seem that a conventional weapon can achieve the same probability of kill as a nuclear weapon, if a large enough warhead can be delivered close enough to the intended target. If a large enough warhead is placed on or near a target, the target will almost invariably be destroyed. Because of weight and range restrictions, it is impossible to simply add more explosives to a delivery vehicle. "Because there are limits to the size of the conventional warhead, and thus to damage to target from blast and overpressure, nonnuclear strategic weapons must be extremely accurate to be effective."[186]

Nuclear warheads offer large explosive effects compared to the weight of the warhead. New conventional warhead technologies try to achieve a larger blast to weight ratio - fuel air explosives (FAE) and enhanced blast (EB) warheads fall in this category - or they try to concentrate the blast towards a very small area - shaped charges and insensitive high explosives designed to utilize kinetic energy to penetrate the target before exploding fall into this category.

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[185]Builder, *The Prospects of Non-Nuclear Means for Strategic Conflict*, 11.

[186]Myra Struck McKitrick, "Nonnuclear Strategic Capability: Technology, Strategy, and the Arms-Control Process," in Kenneth Moss, ed., *Technology and the Future Strategic Environment* (Washington D.C.: The Wilson Press, 1990), 25.

Today the majority of advanced conventional extended-range weapons are either air-launched or sea-launched cruise missiles. Some short-range conventional ballistic weapons are currently available or under production and could be considered advanced conventional weapons. (For example, the army tactical missile system ATACMS, and the Phase II MLRS are two short-range ballistic systems that incorporate terminal guidance.) And although the CEPs and warheads on most current weapons are not sufficient to destroy many hardened targets, current advanced conventional weapons possess sufficient accuracy to neutralize "lightly hardened" targets. According to McKitrick,

> For the past several years, the Navy's conventional Tomahawk land-attack SLCM, with a 1,000-lb warhead and an operational range of 800 miles, has been providing the United States with an option for conventional attack against key air defense targets . . . Potential targets are early warning radars, ground control interceptor sites and long-range surface-to-air missiles.[187]

Geoffrey Loasby of *Jane's Soviet Intelligence Review* has reported that

> Current Soviet ballistic and cruise missiles have been credited with CEP values of 30m, which are more than adequate to deliver FAE warheads to extended area targets such as troop concentrations and airbases. The peak pressures of 20kg/sq cm (285 psi) obtainable at ranges of 15m would be sufficient to severely damage aircraft shelters and most vehicles.[188]

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[187]McKitrick, "Nonnuclear Strategic Capability," 28.

[188]Geoffrey Loasby, "Fuel Air Explosive -- the Alternative to Battlefield Nuclear Weapons?" *Jane's Soviet Intelligence Review*, July 1989, 300.

Significant capabilities to precisely deliver conventional warheads already exist and potential technologies offer the promise of near-zero CEPs for both long-range ballistic missiles and long-range cruise missiles. According to the report entitled *Discriminate Deterrence,* "Current technology makes it possible to attack fixed targets at any range with accuracies within one to three meters."[189]

The cost of long-range ballistic missiles has been too high in the past to warrant much research on the development of guidance systems capable of delivering conventional weapons directly on target, or very close to it. It is very difficult, because of the terminal speed of a reentry vehicle, to make intricate corrections to a ballistic missile's reentry vehicle. Purely inertial guidance systems offer accuracies of around 300 feet. With the addition of an external reference system such as GPS, accuracies of around 150 feet can be achieved independent of weather or time of day. Even greater accuracy can be achieved with terminal seekers.[190]

Work has been conducted on conventionally armed ballistic missiles to attack time-sensitive targets. Airfields are suitable targets for ballistic missile attack because

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[189]Commission on Integrated Long-Term Strategy, Fred C. Ikle and Albert Wohlstetter, chairmen, *Discriminate Deterrence* (Washington D.C.: U.S. Government Printing Office, January 1988), 50.

[190]Kozemchack, "New Guidance for Nuclear and Nonnuclear Weapons," 270.

ballistic weapons could provide quick-reaction strikes and would presumably be more survivable than cruise missiles.[191] According to Myra McKitrick, possibilities exist for new operational concepts involving ballistic missiles:

> . . . new types of systems, such as a "hypersonic" glide vehicle launched, for example by a Minuteman booster, could be designed to deliver conventional warheads at long distance, with great accuracy, and with ballistic-missile-like speed. This system would present a very different type of problem for terminal defenses, and might be able to achieve reasonable effectiveness against fairly hard targets even with a conventional warhead.[192]

Whatever the delivery platform, it is apparent that conventional weapons can be developed to strike within a few feet of a selected target. Hardened aircraft shelters are designed to withstand weapons delivered from above (e.g., gravity bombs). A cruise missile, armed with a penetrating warhead, aimed at the door of an aircraft shelter, conceivably could penetrate the doors and destroy the relatively soft targets within (e.g., the aircraft, the personnel, and the maintenance equipment within the shelter), or at a minimum damage the shelter's doors, making it unlikely that the aircraft inside could be utilized prior to the shelter being retargetted. Similarly, an advanced conventional weapon delivered on a missile silo might severely damage, if not

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[191]See General Andrew Goodpaster, et al., European Security Study, Report of the Special Panel: *Strengthening Conventional Deterrence in Europe* (Boulder, CO: Westview Press, 1985), 57-64.

[192]McKitrick, "Technology and the Future Strategic Environment," 30.

destroy, the soft-skinned missile within it, depending on the hardness of the silo and the penetration capabilities of the weapon. Early-warning radars are relatively easy to destroy with area submunitions or overpressures from, for example, FAEs.

Deeply buried command, control, communications, and intelligence (C^3I) posts may be difficult for both advanced conventional weapons as well as current nuclear weapons to destroy; but C^3I posts must communicate with their forces. Therefore, the communication antennas susceptible to conventional weapons attack could be targeted.

Furthermore, with the increased reliance on computers many hardened sites require substantial environmental control capabilities to maintain the computers in good working order. In hot or humid areas the destruction of air conditioning units could significantly degrade or eliminate the computer capabilities of C^3I sites, rendering the entire C^3I site inoperable.

If the personnel in the bunkers were the targets of an attack, it seems feasible, with a near-zero CEP missile, to target the ventilation shafts that such bunkers rely on. While not ensuring the destruction of the personnel in bunkers, the destruction of a bunker's air supply would oblige the personnel to seek an alternative air source - presumably one of the entrances to the bunker. While land-line communications are used to increase survivability of

communications capabilities, the Gulf War experience demonstrated that many critical land-lines can be disrupted with strikes at key switching facilities and bridges that carry communication cables.[193]

Thus, while hardened targets exist that are relatively secure from both current nuclear weapons and advanced conventional weapons, the missions performed by many of these hardened targets might be disrupted or stopped with the judicious placement of appropriate conventional weapons. An authoritative source has calculated the expected effectiveness of conventional munitions against several targets using a 1000-pound munition and various CEPs. The following table is illustrative of assumptions involving the number of near-zero CEP weapons required to destroy several targets:

[193]For a discussion of the Coalition campaign against Iraqi communications see Eric Schmitt, "Iraq Said to Hide Key War Center In a Baghdad Hotel for Foreigners," *New York Times*, 14 February 1991, A1.

ASSUMPTIONS ABOUT TARGETING AND WEAPON ALLOCATION

Target Type	Number of Weapons/Target[1]	Number of Attacks/Target
Airfield Runways	9	3
Railroad Bridges	10(5)/aimpoint	3
Highway Bridges	5(2)/aimpoint	3
POL Pumping Stat.	10(3)/aimpoint	1
Maneuver Units and Artillery Battalions	5/unit or battalion	3
Mobile Missile	5(2)/launcher	2

[1] Assumes a 3-meter CEP; the lower number (in parentheses) would be if a 1-meter CEP weapon were available.[194]

B. MILITARY FEASIBILITY

Many argue that conventional weapons will never have the ability to threaten entire cities or societies with the rapid destruction of which nuclear weapons are capable. However, as noted in chapter two, the perceived ability of nuclear weapons to threaten the destruction of an entire city, society, or even planet is one of the key reasons for the delegitimization of nuclear deterrence. Moreover, while conventional weapons may never have the ability to threaten cities or societies

[194]The panel on Standoff Weapons of the Offense-Defense Working Group, "Extended-Range Smart Conventional Weapon Systems," a Memorandum for The Commission on Integrated Long-Term Strategy, Fred C. Ikle and Albert Wohlstetter, chairmen, *Discriminate Deterrence* (Washington D.C.: U.S. Government Printing Office, Jan. 1988),48 (Table A.2). Also see p.16.

with rapid destruction as nuclear weapons can, the operational nuclear strategy of the United States has not emphasized such threats. For most of the nuclear age U.S. nuclear employment strategy has been counterforce in nature. According to Builder, "although assured destruction figures prominently in the Western rationale for strategic nuclear forces urban and industrial targeting may in fact account for only 10-15% of the total U.S. requirements for strategic nuclear weapons."[195]

If advanced conventional weapons promise sufficient destruction of strategic targets, as the previous section argued, the two questions that must be answered are (1) whether strategic targets can be located and identified with sufficient accuracy to allow for advanced conventional weapons attack, and (2) whether advanced conventional weapons will have a high probability of striking their targets.

Cruise missiles are difficult to detect because they often fly at altitudes less than 100 feet; they rely on ground clutter (radar returns associated with terrain features) to make themselves more difficult to identify. Additionally, the lower the altitude at which a weapon flies, the closer it can approach a radar before it will reflect radar returns because of the curvature of the Earth and the line-of-sight nature of most radars. Since they are difficult to detect, they are

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[195]Builder, *The Prospects and Implications of Non-Nuclear Means for Strategic Conflict*, 15.

difficult to shoot down. With the advances made in look-down shoot-down fighter aircraft, cruise missiles will become more susceptible to attack. Work is underway to incorporate "stealth" technologies in cruise missiles that would make them harder to locate. Research and development are also underway to increase the speed of cruise missiles, which would decrease the amount of time a low-flying missile could be detected by radar. "Aerospatiale is attempting to enhance its attack missile capability in three areas: speed, the most effective method of penetration; maneuverability, both cruise and terminal phase; and stealth, important but not paramount."[196]

Large numbers of cruise missiles attacking from several different directions would make it difficult for the defender to destroy all of the attacking missiles. Defensive forces could presumably be overwhelmed by large numbers of relatively inexpensive offensive missiles. There is also the possibility that states desiring nuclear weapons would have to spend additional funds on purchasing defensive weapons, in light of the advanced conventional weapon threat, that would otherwise be available to be spent on nuclear weapons research.

It seems likely that fixed or semi-fixed targets will be susceptible to location and identification with national technical means. Mobile targets, however, will continue to be difficult to acquire. It is difficult to deliver a weapon on

[196]Charles Bickers, "Limits on Stealth," *Jane's Defense Weekly*, 16 March 1991, 397.

a mobile target before it moves, even if it is found. Long-range ballistic missiles have flight times of several minutes (10 to 30 minutes, depending on their range and trajectory), during which a mobile target might escape. Nuclear weapons could presumably destroy many mobile targets in the vicinity of ground zero, but this would presumably require large warheads, with large associated collateral damage, to sufficiently ensure the destruction of a mobile target in motion. Conventional weapons technologies can be used to solve some of the problems associated with mobile targets, with smaller warheads and lower costs per delivery vehicle compared to long-range nuclear-armed ballistic missiles.

The concept behind the development of the Tacit Rainbow missile, designed to destroy radar sites, was that it would be launched from an aircraft and loiter in the vicinity of a suspected covert or mobile radar site for up to 40 minutes until the radar emitted; and then it would strike the target. It is theoretically possible to build a similar missile that would loiter in the vicinity of a suspected offensive mobile missile battery and attack when the target is detected emerging from its hiding place. Computer logic and sensors to recognize, for example, a synthetic aperture radar return, micro-laser radar, or infrared return, or any combination of terminal sensors, could be used to cue the weapon to strike its target. It is also theoretically possible to build a conventional cruise missile with sensors, such as side-looking

radars, to increase the search capabilities of the weapon and thus find the discriminate target characteristics of its prey before attacking.

Military feasibility is also dependent on cost. Critics of advanced conventional weapons point to the relatively high cost of such weapons. TLAM-C is reported to cost around $ 1,000,000 per missile[197]. According to the Panel on Standoff Weapons,

> Unit missile costs of $500,000 or less should be possible through requirements management to avoid overspecification, and the application of a modular design approach that will support production quantities sufficiently large to achieve economies of scale.[198]

Paul Kozemchak writes that "[a] small standoff stealth missile with accuracy under a few meters and a range of 300 nautical miles reportedly could be built for $300,000, and a long-range zero CEP missile for $250,000 to $500,000."[199]

The evidence seems to confirm that not only are strategic advanced conventional weapons technically feasible, but they are also financially affordable and the cost are competitive with strategic nuclear weapons systems. (Trident D-5 missile is reported to average approximately $30 million and the MX

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[197]Ed Magnuson, "High-Tech Payoff," *Time*, 28 January 1991, 30.

[198]The panel on Standoff Weapons of the Offense-Defense Working Group, "Extended-Range Smart Conventional Weapon Systems," a Memorandum for The Commission on Integrated Long-Term Strategy, 27.

[199]Kozemchak, "New Guidance for Nuclear and Nonnuclear Weapons," 269.

Peacekeeper missile is reported to cost approximately $50 million.)[200] Capability, survivability, and costs of strategic advanced conventional weapons can all be made to meet military requirements. Costs, in particular, appear reasonable when one takes the long-term costs of personnel, production, and maintenance of manned conventional platforms into consideration, or, as in the case of nuclear weapons, costs for the cleanup of old nuclear weapons production facilities and construction costs for new nuclear weapons production facilities. The relative costs of alternatives to extended-range conventional weapons make the unit costs of advanced conventional weapons seem more acceptable.

C. CONCEPTS OF USE AND DEVELOPMENT

Advanced conventional weapons can be viewed in a number of roles. Four examples of potential roles for advanced conventional weapons are noteworthy:

1. One can view advanced conventional weapons simply as substitutes for nuclear weapons, at least against some types of targets. The near-zero CEP accuracies would be utilized to strike strategic conventional and nuclear targets. Advanced conventional weapons would be a means of raising the nuclear threshold.

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[200]For a discussion of the approximate costs of Trident II and Peacekeeper missiles see Barry D. Watts, "The Conventional Utility of Strategic Forces," *The Washington Quarterly*, Autumn 1991, 183.

2. Advanced conventional weapons could be used as a warning to demonstrate the punishment that could be inflicted on an enemy, without having to resort to nuclear weapons. According to McKitrick,

> With a highly accurate conventional weapon, one or more well-placed shots as a sign of resolve could have a psychological impact comparable to a nuclear strike, yet without the collateral damage. Imagine a cruise missile with one- to three-meter CEP delivered to a specific window in the Kremlin, or to a particular corner of Red Square.[201]

3. Advanced conventional weapons could be used to destroy the infrastructure of terrorist groups. The U.S. retaliatory strikes against Libya in April 1986 could have been conducted by advanced conventional weapons. According to Kozemchak,

> The use of current technology would have allowed the United States to destroy the Libyan Central Security Organization headquarters without damaging the French Embassy, for example. Quaddafi's command center could have been destroyed without damaging his tent. Of the U.S. raid on Libya, Admiral William Crowe, chairman of the Joint Chiefs, said: "No matter how much equipment you've got, it still takes a lot of guts to keep that aircraft steady and line up the cross hairs when all kinds of stuff is coming up around you."[202] Advanced cruise missiles and other standoff weapons could make misspent courage less likely.[203]

4. If a large-scale nuclear war were to take place, advanced conventional weapons could be used to complement the

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[201]McKitrick, "Technology and the Future Strategic Environment," 32-33.

[202]Cited in Russell Watson, John Barry, and John Walcott, "Reagan's Raiders," *Newsweek*, 28 April 1986, 26, in Kozemchak, "New Guidance for Nuclear and Nonnuclear Weapons," 267-268.

[203]Ibid.

strategic nuclear arsenal. Because of the decreasing nuclear inventory, advanced conventional weapons could be used to target air defense positions on the periphery of the enemy, to open corridors for manned strategic bombers. With the shrinking of the U.S. nuclear arsenal it is theoretically possible that at some point only advanced conventional weapons will be available for defense suppression missions.

D. SUMMARY

The technical and military feasibility of using advanced conventional weapons to destroy many strategic targets previously reserved for nuclear weapons appears certain. While specific targets remain outside the current or probable capabilities of advanced conventional weapons, the number of strategic targets safe from conventional attack is rapidly shrinking.

Institutional inertia is also beginning to change. U.S. military leaders are underscoring the advantages that advanced conventional weapons offer compared to nuclear weapons. As General Colin Powell, Chairman of the Joint Chiefs of Staff, noted regarding President Bush's 27 September 1991 announcement,

> I would also point out that the increased capability associated with conventional weaponry in recent years has, to some extent, inclined us in the direction of getting rid of tactical nuclear weapons. We can now do

conventionally much more efficiently things we thought we could only do with tactical nuclear weapons.[204]

Much of the distinction between tactical and strategic nuclear weapons has been the range of the weapons. Many of the same types of targets were to be targeted by both strategic, as well as tactical nuclear weapons (e.g., command and control facilities, air defense sites, etc.). Advanced conventional weapons can efficiently strike a broad range of strategic and tactical targets. The extraordinary capabilities of advanced conventional weapons technology are even more significant in the context of the delegitimization of nuclear deterrence and the remarkable costs associated with nuclear weapons production facilities and environmental cleanup. The costs of an advanced conventional weapon like TLAM-C reported to be $1,000,000 per missile[205] are attractive when compared to the approximately $30 million for the Trident II D-5 missile and the approximately $50 million for the Peacekeeper missile.[206] In the future, the reluctance to use nuclear weapons as well as the declining numbers of nuclear weapons will encourage the United States to rely more on strategic advanced conventional weapons.

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[204]Transcript of Secretary of Defense Dick Cheney and General Colin Powell, Chairman, JCS: *News Briefing*, Office of the Assistant Secretary of Defense for Public Affairs, 28 September 1991, 11.

[205]Magnuson, "High-Tech Payoff," 30.

[206]Barry D. Watts, "The Conventional Utility of Strategic Forces," 183.

VI. ANALYSIS

The previous chapters examined a number of disincentives against the continued heavy reliance on nuclear weapons by the United States and incentives for expanding the roles of advanced conventional weapons. Incentives for the substitution of advanced conventional weapons for nuclear weapons include the decreasing utility of nuclear weapons, as well as the increased technical and military feasibility of advanced conventional weapons to conduct missions previously thought possible only with nuclear weapons.

Nuclear weapons have played, and will continue to play, critical political-military roles in U.S. national security policy - above all, deterrence and war-prevention in relations with adversaries, and reassurance and extended deterrence in relations with allies and other security partners. Congressional and public support for nuclear weapons may, however, continue to decline; and fundamental changes in the capabilities of advanced conventional weapons have occurred that make effective strategic advanced conventional weapons possible. U.S. military planners must determine how to accomplish the missions once assigned to nuclear weapons. This thesis argues that advanced conventional weapons, designed and utilized as strategic weapons, can substitute for

nuclear weapons in many, possibly even most, missions currently assigned to nuclear weapons.

A. UNCERTAINTY OVER THE FUTURE OF THE AMERICAN NUCLEAR ARSENAL

Military and civilian strategists have historically counted on the continuing presence of a large American nuclear arsenal. The assumption was, and to a degree is, that the overwhelming destructiveness of nuclear weapons ensured the predominant strategic role of nuclear weapons. Instead, the shear magnitude of the destructive capacity of nuclear weapons has created both a reluctance to use nuclear weapons and a strong desire to denuclearize. According to Edward Luttwak,

> Even the early fission bombs exceeded the culminating point of military utility *because they were deemed* excessively destructive to be used when less-than-vital interests were at stake, quite aside from any fears of retaliation in kind. The result was self-inhibition.[207]

The reluctance to use nuclear weapons has been discussed in previous chapters. The desire to denuclearize is reflected in statements and actions by recent American Presidents. President Jimmy Carter in his Inaugural Speech said the "ultimate goal" was "the complete elimination of nuclear weapons from this Earth."[208] President Ronald Reagan,

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[207]Edward Luttwak, "An Emerging Postnuclear Era?" *The Washington Quarterly*, Winter 1988, 9.

[208]U.S., Presidents *Public Papers of the Presidents of the United States* (Washington, D.C.: Office of the Federal Register, National Archives and Records Service, 1977), Jimmy

addressing the nation on his meetings with Soviet General Secretary Gorbachev, announced that:

> We offered the complete elimination of all ballistic missiles -- Soviet and American -- from the face of the Earth by 1996. . . . we are closer than ever before to agreements that could lead to a safer world without nuclear weapons.[209]

Recent reflections of the desire to denuclearize include President Bush's 27 September 1991 announcement concerning nuclear weapons reductions and the further reductions President Bush announced in his January 1992 State of the Union address. President Bush announced on 27 September 1991, that he had directed that the United States "eliminate its entire worldwide inventory of ground-launched short-range nuclear weapons."[210] Furthermore, the President announced his decision to eliminate most tactical nuclear naval weapons and to withdraw and store all nuclear Tomahawk Land Attack Missiles (TLAM-N).[211] His decision effectively eliminated much of the tactical nuclear arsenal from the operational

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Carter, 1977, Book I, 3.

[209]U.S., Presidents, *Public Papers of the Presidents of the United States*, (Washington, D.C.: Office of the Federal Register, National Archives and Records Service, 1987), Ronald Reagan, 1986, Book II, 1367.

[210]President, Address. "Address to the Nation on Reducing United States and Soviet Nuclear Weapons," *The Weekly Compilation of Presidential Documents* (30 September 1991) vol. 27, no.39, 1348.

[211]Ibid., 1350.

inventory. In the State of the Union address President Bush announced that:

> After completing 20 planes for which we have begun procurement, we will shut down further production of the B-2 bomber. We will cancel the small ICBM program. We will cease production of new warheads for our sea-based ballistic missiles. We will stop all new production of the Peacekeeper missile. And we will not purchase any more advanced cruise missiles.[212]

He also announced that he had informed President Yeltsin of the Russian Federation that if the Commonwealth of Independent States would eliminate all its land-based multiple-warhead missiles that the United States would do the following:

> We would eliminate all Peacekeeper [MX] missiles. We would reduce the number of warheads on Minuteman missiles to one, and reduce the number of warheads on our sea-based missiles by one-third.[213]

The world has seen drastic changes in the past three years. Communist regimes have been overthrown in Eastern Europe. The American-led United Nations coalition achieved an overwhelming victory, in February 1991, over the military forces of Iraq. Most significant, though, was the breakup of the Soviet Union after the failed coup of August 1991. The changes have caused many to question the continuing validity of U.S. military strategy. With the disintegration of America's most capable military threat, non-military national problems have gained predominance in the minds of many

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[212]"The State of the Union: Text of President Bush's Address," *Washington Post*, 29 Jan 1992, A14.

[213]Ibid.

Americans. Economic, social, and environmental priorities are naturally more urgent when external threats to national security appear minimal.

Indeed, it seems uncertain whether, in the new military and political climate that allows the President to drastically reduce nuclear weapons, Congress and the American public can be convinced of the need for extensive and costly modernization of the American nuclear weapons production capabilities. As the "Reed Report," entitled *The Role of Nuclear Weapons in the New World Order*, concludes:

> The American public does not want to pay for more than it believes to be necessary, and in the aftermath of the Cold War, there are strong, newly vocal sentiments that the defense budget should drop sharply and quickly . . . Military programs that are visibly expensive and/or pose high risks to the environment or health will be notably affected by grassroots opposition. In this milieu, it will be more difficult than ever to build and sustain consensus for modernization of highly visible nuclear forces, despite the fact that strategic deterrence remains the intellectual cornerstone of national defense. There will be a strong public tendency to accept arguments that less is enough, except where compelling rationales or real world crises argue to the contrary.[214]

The decision to build new nuclear weapons production facilities may be delayed indefinitely. Current nuclear weapons stockpiles will become older, and more costly to

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[214]Thomas C. Reed and Michael O. Wheeler, *The Role of Nuclear Weapons in the New World Order*, January 1992, 15. Thomas Reed was Secretary of the Air Force from 1976 to 1977. He was also the chairman of the panel that investigated the role of nuclear weapons in the new world order. The resulting report, therefore, is often referred to as the "Reed Report."

maintain. Thus, the continued viability of a large American nuclear arsenal may well be in doubt.

B. THE "REED REPORT"

The Reed Report lists a number of "objectives which have attended the development of the American nuclear posture during the Cold War era."[215] They have included:

> * Maintaining effective deterrence so that a potential aggressor would conclude that the cost of a nuclear attack against the United States or its allies or friends would far exceed any expected gain.
>
> * Contributing to deterrence of non-nuclear attacks on, or attempted coercion of, the U.S. or its allies or friends.
>
> * Fostering stability in its several dimensions.
>
> * Maintaining the capability, if deterrence fails, to respond flexibly and effectively to an aggressor's first strike, so as to limit damage to the extent feasible and terminate the conflict on acceptable terms.
>
> * Containing further proliferation of nuclear weapons and advanced delivery systems.
>
> * Negotiating effectively verifiable reductions and restrictions on nuclear forces.[216]

The means to accomplish the stated objectives are by no means limited exclusively to nuclear weapons. It is difficult, if not impossible, to conclusively determine cause and effect in political-military relations between states. Therefore, there is no direct evidence that deterrence of

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[215]Ibid., 5.

[216]Ibid., 15.

nuclear attack on the United States has been effected by American nuclear weapons. "John Mueller has recently advanced the hypothesis that nuclear weapons have been essentially irrelevant: the major powers are no longer prone to war because (among other things) of their horrific experience with conventional conflicts during 1914-18 and 1939-45, not because of their fear of nuclear Armageddon."[217] On the other hand, there is sufficient evidence to suggest that since the 1960s American nuclear weapons threats have been seen as politically unusable against non-nuclear states. Thus, according to Harry Summers, "[i]n none of the wars of the atomic era had nuclear weapons been the battlefield determinants that their creators had prophesied."[218]

Advanced conventional weapons, because of their usability, offer a greater ability than do current nuclear weapons to respond flexibly and effectively. The employment of most current surface and air-burst nuclear weapons could cause significant environmental consequences affecting large geographic areas.

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[217]John Mueller, *Retreat from Doomsday: The Obsolescence of Major War* (NY: Basic Books, 1989). See also Mueller, "The Essential Irrelevance of Nuclear Weapons: Stability in the Postwar World," *International Security*, Fall 1989, 55-79, cited in Patrick J. Garrity, "The Depreciation of Nuclear Weapons in International Politics: Possibilities, Limits, Uncertainties," *Journal of Strategic Studies*, December 1991, 467.

[218]Harry Summers, "Warfare going the conventional way," *Washington Times*, 23 April 1992, G-3.

The United States should seek to reconfigure its remaining nuclear arsenal in order to take advantage of some of the same technologies that make advanced conventional weapons possible. More discriminate nuclear options are possible. If nuclear weapons are to have a credible future in the United States military posture, the executive branch must convince Congress that safe and discriminate weapons can be developed and that they are needed. The U.S. defense establishment must also prove that key missions exist that are beyond the scope of either current nuclear weapons or advanced conventional weapons.[219]

In particular, the United States should use the advances in weapons accuracy to further pursue earth-penetrating nuclear weapons. Earth penetrators would be more discriminate than surface or air-burst nuclear weapons and would complement strategic advanced conventional weapons. The same technologies that make strategic advanced conventional weapons possible could contribute greatly to the ability to reduce nuclear warhead size while at the same time increasing the destructive capability of nuclear weapons against deep underground targets.[220]

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[219]See the Report of The Commission On Integrated Long-Term Strategy, Fred C. Ikle and Albert Wohlstetter, chairmen, *Discriminate Deterrence*, 57-61.

[220]See Report by the Working Group on Technology, submitted to the Commission on Integrated Long-Term Strategy, *Technology For National Security* (October, 1988),43-44. Also see Albert Wohlstetter, "Between an Unfree World and None,"

C. STRATEGIC CONVENTIONAL WEAPONS

A strategic weapon[221] is not defined by its explosive force, its range, or speed of attack. For a weapon to be a strategic weapon it must not only possess the ability to destroy a range of strategic targets[222] with relatively high assurance of success, but its use as a strategic weapon must be accepted as such. Some branches of the U.S. armed forces, until very recently, did not accept advanced conventional weapons as strategic in nature, perhaps partly because of the large numbers of nuclear weapons. According to Barry Watts, "SAC [Strategic Air Command] has generally neglected the development of advanced nonnuclear munitions for its heavy bombers."[223]

For too long military and civilian strategists have assumed the continued existence of, and willingness to use, nuclear weapons. Too little thought has been given to the possibility that nuclear weapons might not be available for

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971.

[221]See footnote 143 in chapter four.

[222]Strategic Targets are targets whose destruction contribut to the overall war effort. Strategic targets are those targets that are vital to the enemy's overall war fighting capabilities and/or his will to wage war. Strategic targets include, but are not limited to, reserve troop concentrations, supply depots, strategic weapons systems, C^3I sites, military production facilities, sources of raw materials, transportation systems, and petroleum refineries.

[223]Watts, "The Conventional Utility of Strategic-Nuclear Forces," 181.

use in a major war either because of a lack of weapons or a reluctance to use them.

Increasingly the United States will find it necessary to plan for contingencies throughout the world. Many potential "hot spots" could affect U.S. interests and the interests of allies, friends, or neutrals. The United States will be increasingly concerned with confining the effects of strategic strikes to limited geographic areas, thus avoiding damage to friendly or neutral nations near the enemy. It will be politically difficult, if not impossible, to threaten nuclear weapons use when the environmental effects of nuclear weapons cannot be confined to the enemy's territory. This is especially true when more discriminate alternatives are available. According to the Reed Report,

> With the advent of near zero CEP stealthy weapons, multi-spectral intelligence, and improved warhead lethality, it is now possible to launch non-nuclear strikes on C3I, defenses, and (if desired) leadership. Such capabilities could be very useful in escalation control. The same capabilities could be effective in contingencies involving small numbers of weapons launchers, manufacturing facilities, or storage sites in the target state. The Gulf War also focused attention on the need to attack specific sites like bunkers or nuclear facilities with massive but geographically confined force.[224]

Advanced conventional weapons can and should be used as strategic weapons, especially in the case of extended deterrence. Nuclear weapons, on the other hand, can and should continue to fulfill strategic missions. In November

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[224]Reed and Wheeler, *The Role of Nuclear Weapons in the New World Order*, 33-34.

1991, NATO's heads of State and Government approved a new strategic concept that reaffirmed the traditional war-prevention purpose of NATO nuclear forces. According to the new concept,

> Nuclear forces based in Europe and committed to NATO provide an essential political and military link between the European and the North American members of the alliance. . . . These forces need to have the necessary characteristics and appropriate flexibility and survivability, to be perceived as a credible and effective element of the Allies' strategy in preventing war.[225]

Increasingly, however, many are claiming that the only credible mission for current strategic nuclear weapons will be deterrence of direct attack on U.S. territory. Nuclear weapons will continue to be used for extended deterrence to prevent aggression against Western Europe, but advanced conventional weapons can and should play a larger (and more credible) role in reinforcing the U.S. commitment - both nuclear and conventional - to defend Europe.

D. SUMMARY

Military organizations throughout history have failed to recognize when a weapon has lost most of its military significance. According to Edward Katzenbach,

> The persistence of the horse cavalry in the face of several developments in weapons technology and the experiences of two world wars stands as testimony to the strength of organizational survival as a motivation. . . . If the cavalry were deprived of its cold steel, would it

[225]"The Alliance's New Strategic Concept," 7 November 1991, paragraph 56.

> lose that fine edge of morale, that elan without which of course it simply would not be "cavalry," no matter what its mission?[226]

Just as the horse cavalry lost its significance, relatively indiscriminate nuclear weapons have lost, or soon will lose, a significant portion of their political and military utility. U.S. strategic planners must recognize and adjust to this trend, which has been apparent for several years.

Military planners must evaluate the kinds of targets that can be attacked with advanced conventional weapons. For those targets that cannot be attacked with current advanced conventional weapons the U.S. military must establish requirements for the development of discriminate forces that can effectively strike those targets. Only when strategic planners accept advanced conventional weapons as strategic weapons will they truly be strategic.

With current and foreseeable advances in advanced conventional weapons technologies, the United States can continue its policy of working towards the drastic reduction of nuclear weapons throughout the world.[227] Non-lethal

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[226]Edward Katzenbach, "The Horse Cavalry in the Twentieth Century: A Study in Policy Response," *Public Policy*, 8 (1958), 120, 122.

[227]See President, Address. "Address to the Nation on Reducing United States and Soviet Nuclear Weapons," *The Weekly Compilation of Presidential Documents* (30 September 1991) vol. 27, no.39, 1348. and "The State of the Union: Text of President Bush's Address," *Washington Post*, 29 Jan 1992, A14.

technologies such as lasers that are designed to destroy radars and communication equipment[228] are illustrative of other advanced nonnuclear options that should be pursued conceptually and technically. Drastic reductions in the number of nuclear weapons around the world would tend to favor the United States, especially if the U.S. further developed strategic advanced conventional weapons. The United States could claim superiority in strategic advanced conventional weapons. Interestingly, Secretary of Defense Cheney wrote in February 1992 that "No country is our match in conventional military technology and the ability to apply it."[229]

Few nations other than the United States have all of the necessary elements to use advanced conventional weapons for strategic purposes. Few nations possess the intelligence collection systems, the command and control systems, and the financial and technical wherewithal to effectively utilize advanced conventional weapons for strategic purposes.

E. RECOMMENDATIONS

It has long been recognized that it would be highly desirable for the United States to diversify its long-range

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[228]See Barbara Opall, "Pentagon Units Jostle over Non-Lethal Initiative," *Defense News*, 2 March 1992, 6, and "Pentagon Eyes Minimum Lethality Weapons," *Aerospace Daily*, 6 March 1992, 377.

[229]Dick Cheney, *Annual Report of the Secretary of Defense to the President and the Congress* (Washington D.C.: Government Printing Office, February 1992), vi.

strike options with systems less destructive and less politically problematic than nuclear weapons. This thesis argues that advanced conventional weapons are not only credible but also feasible elements of a more diverse and flexible strategic posture.

With respect to arms control the United States should pursue the reduction of nuclear weapons throughout the world. The United States must seek to at least maintain nuclear parity with the next largest nuclear power - that currently being the former Soviet Union. According to the Reed Report, "The U.S. arsenal should retain parity with the nuclear forces of the former USSR, and also must maintain a substantial margin over the other world nuclear powers . . ."[230] While seeking nuclear weapons reductions the United States must resist any constraints on advanced conventional weapons. The 1987 INF Treaty eliminated U.S. and Soviet ground-based intermediate-range missiles, but it also deprived the United States of the option of deploying conventionally armed ground-launched ballistic and cruise missiles in the relevant range categories.[231] The same mistake must not be made in future nuclear arms reduction negotiations.

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[230]Reed and Wheeler, *The Role of Nuclear Weapons in the New World Order*, iv.

[231]See *Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Short-Range Missiles.*

VII. CONCLUSIONS

Significant incentives and sufficient means exist for the United States to further develop advanced conventional weapons to accomplish missions previously reserved for nuclear weapons on both the tactical and strategic levels of warfare. This conclusion is based on a survey of (a) apparent incentives for an increased reliance on advanced extended-range conventional weapons, (b) potential capabilities and limitations of such weapons, and (c) possible strategic implications of an increased emphasis on such weapons.

A. INCENTIVES FOR THE SUBSTITUTION OF ADVANCED CONVENTIONAL WEAPONS FOR NUCLEAR WEAPONS

Incentives include (a) the delegitimization of nuclear deterrence, (b) environmental, technical, and safety concerns associated with nuclear weapons, (c) the declining credibility of threats to use nuclear weapons in military operations, and (d) the more credible threat of discriminate advanced conventional weapons.

Moral, political, and environmental concerns about the use, storage, and production of nuclear weapons have created a reluctance to rely on nuclear weapons employment threats and a desire to denuclearize. The thesis concludes that nuclear

weapons strike plans of certain types exceed the limits of the traditional Western "just war" principles of proportionality and discrimination. Most Americans believe warfare beyond these limits is morally and politically unacceptable. Environmental-damage prospects associated with nuclear war such as the "nuclear winter" theory, although shown to be "poor science," have caused concerns for some Americans. Moreover, the dilapidated state of U.S. nuclear weapons production facilities and the administration's initiatives in 1991 and 1992 to cut back U.S. nuclear capabilities raise uncertainties about the future of U.S. nuclear weapons programs.

The thesis also concludes that the deterrent effect of nuclear weapons has probably diminished as a result of the reluctance to use nuclear weapons. Advanced conventional weapons are more usable than nuclear weapons and therefore more credible as deterrent threats. Thus, if (as most deterrence theories claim) the credibility of threats is crucial, discriminate advanced conventional weapons clearly reinforce deterrence. Advanced conventional weapons offer the ability to directly threaten strategic targets deep within an enemy's territory, including enemy leaders themselves, without the fear of causing significant collateral damage. Furthermore, advanced conventional weapons reduce the risk of U.S. casualties in the event of conflict. Advanced conventional weapons offer the possibility to threaten the

destruction of industrial, military, and political targets discriminately and effectively.

B. CAPABILITIES OF ADVANCED CONVENTIONAL WEAPONS

With sufficient accuracy, almost any man-made target can be destroyed with conventional weapons. Current warhead technology allows for the destruction of most types of strategic targets[232] with weapons of 1 to 3 meters CEP accuracy. Currently available guidance technology can already provide this level of accuracy. Thus, the ability to strike a significant range of strategic targets with non-nuclear warheads already exists.

The cost of advanced conventional weapons is competitive with nuclear weapons when one considers the cleanup and modernization costs for nuclear weapons production facilities - to say nothing of the problem of nuclear waste disposal when warheads that are no longer needed must be dismantled. Advanced conventional weapons can be acquired at a cost of

[232]As noted in chapters four and six, strategic targets are targets whose destruction contribute to the overall war effort. Strategic targets are those targets that are vital to the enemy's overall war fighting capabilities and/or his will to wage war. Strategic targets include, but are not limited to, reserve troop concentrations, supply depots, strategic weapons systems, C^3I sites, military production facilities, sources of raw materials, transportation systems, and petroleum refineries. (See footnotes 143, 221, and 222.)

$500,000, according to one analyst, to $800,000 for the TLAM-C Block III, with proper incentives for manufacturers.[233]

C. SUMMARY

In current political circumstances, the need for strategic nuclear weapons appears minimal. As long as actual and potential nuclear threats to U.S. and allied security exist, however, the U.S. must maintain sufficient nuclear forces to ensure credible central and extended deterrence. Political circumstances are subject to relatively rapid change, and strategic nuclear forces cannot be promptly improvised.

It is militarily and politically imperative that the United States also find discriminate, useable, and credible alternatives to nuclear threats. Advanced conventional weapons can be used to threaten the destruction of a broad range of strategic targets. Advanced conventional weapons, because they are useable, are more credible and effective deterrent threats, especially in the regional conflicts that the United States may increasingly be concerned with.

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[233]For details see chapter five.

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