Future United States Strategy in the Third World: C3I Challenges for the USAF

John C. Ruess

Program on Information Resources Policy

Harvard University

Center for Information
Policy Research

Cambridge, Massachusetts

A publication of the Program on Information Resources Policy.

Future United States Strategy in the Third World:
C³I Challenges for the USAF

John C. Ruess
September 1990, P-90-7

John C. Ruess is currently with the Defense Intelligence Agency in Washington, D.C.
He prepared this report as a visiting research fellow with the Program.

PROGRAM ON INFORMATION RESOURCES POLICY

Harvard University   **Center for Information Policy Research**

Affiliates

ABRH Consulting
Action for Children's Television
American Newspaper Publishers Association
American Telephone & Telegraph Co.
Ameritech Publishing
Apple Computer, Inc.
Arthur D. Little, Inc.
Auerbach Publishers Inc.
Bell Atlantic
Bell Canada
BellSouth Corporation
Boice Dunham Group Inc.
Bull, S.A. (France)
Centel Corporation
Chronicle Broadcasting Company
CMC Limited (India)
Commission of the European Communities
Communications Workers of America
Computer & Communications Industry Assoc.
COMSAT
Data America Corp.
Dialog Information Services, Inc.
Digital Equipment Corp.
Dow Jones & Co., Inc.
France Telecom
Gartner Group, Inc.
GTE Corporation
Hitachi Research Institute (Japan)
Honeywell, Inc.
IBM Corp.
Information Gatekeepers, Inc.
Information Industry Association
International Data Corp.
International Resource Development, Inc.
Invoco AB Gunnar Bergvall (Sweden)
I.T. Direction Ltd. (UK)
Knowledge Industry Publications, Inc.
Korean Telecommunications Authority
Lee Enterprises, Inc.
John and Mary R. Markle Foundation
MCI Telecommunications, Inc.
Mead Data Central
MITRE Corp.
National Telephone Cooperative Assoc.
The New York Times Co.
NEC Corp. (Japan)
Nippon Telegraph & Telephone Corp. (Japan)

Northern Telecom Ltd. (Canada)
Nova Systems Inc.
NYNEX
Ing. C. Olivetti & Co., S.p.A.
OTC Limited (Australia)
Pacific Telesis Group
Public Agenda Foundation
Research Institute of Telecommunications and
    Economics (Japan)
RESEAU (Italy)
Revista Nacional de Telematica (Brazil)
Salomon Brothers
Scaife Family Charitable Trusts
SEAT S.P.A. (Italy)
Southern New England Telecommunications
    Corp.
State of California Public Utilities Commission
State of Minnesota Funding
TEKNIBANK S.p.A. (Italy)
Telecom Australia
Telecommunications Research Action Center
    (TRAC)
Tele/Scope Networks, Inc.
Third Class Mail Association
Times Mirror Co.
Tribune Company
United States Government:
    Department of Commerce
        National Telecommunications and
        Information Administration
    Department of Defense
        National Defense University
    Department of Health and Human Services
        National Library of Medicine
    Department of State
        Office of Communications
    Federal Communications Commission
    General Services Administration
    National Aeronautics and Space
        Administration
    National Security Agency
    U.S. General Accounting Office
    United States Postal Rate Commission
United Telecommunications, Inc.
US West
Williams Telecommunications
Wolters Kluwer

Acknowledgments

Thanks go to the following persons who reviewed and commented critically on drafts of this report:

Disclaimer

These reviewers and the Program's affiliates are not, however, responsible for or necessarily in agreement with the views expressed herein, nor should they be blamed for any errors of fact or interpretation.

The views, opinions, and/or conclusions expressed in this paper are those of the author and should not be construed as a Department of Defense, U.S. Air Force, or any other governmental official position.

Executive Summary

- The success of future U.S. Air Force Third World strategy will depend directly on its corresponding C^3I. This strategy will create new challenges for future C^3I organizational structures and technologies.

- The U.S. Air Force is a primary participant across the entire spectrum of potential conflict in the Third World. Its future force structure will depend upon advanced technologies in areas such as surveillance and reconnaissance, weapons guidance and delivery, communications, and intelligence filtering and analysis (fusion) to enhance efficiency, flexibility, and survivability.

- Future economic prosperity and security of western and Pacific Rim nations depend upon the political and military stability of the Third World.

- Availability of modern arms, and rapid advances in intermediate range missiles, biological, chemical, and nuclear weapons, are creating a more lethal Third World environment, undermining regional stability.

- Future U.S. Air Force strategy will be additionally challenged by uncertain Third World political climates, tightly constrained U.S. defense budgets, and reductions in U.S. military forces.

- Dilemmas arise in determining the optimum degree of intelligence fusion at the national and theater levels to support United States forces in future Third World conflicts. This issue additionally influences the level of command and control delegated to the theater commander.

- The balance between national and theater levels of intelligence processing is also affected by communications technologies and the need for flexibility and redundancy.

- Critical issues also include incorporating C^3I into the strategy evolution process and balancing nationally controlled systems with theater requirements.

- The term "C^3I" has many interpretations by industry and government. Nonetheless, it serves as a crucial element in implementing future strategy. C^3I organizational structures and technologies must possess the attributes of timeliness and flexibility across the entire spectrum of potential conflict.

Table of Contents

The information base for this report

ends July 1989.

List of Figures

List of Tables

CHAPTER ONE

FUNDAMENTAL CHALLENGES IN THE COMING DECADE

United States military forces are at a critical juncture, facing key challenges in support of future national security objectives which will have major implications well into the 1990s. These challenges are the result of rapid, fundamental transformations in political, economic, and military environments taking place not only in the United States, but also among U.S. allies and throughout the developing Third World nations. This paper examines the pertinent issues, stakeholders, and conflicts that may fundamentally influence future United States military strategy in the Third World and focuses on the corresponding command, control, communications, and intelligence (C^3I) challenges of the United States Air Force in the coming decade.

Specifically, many Third World nations are rapidly acquiring military capabilities that will allow their future forces to challenge the United States in regional conflicts. The Commission On Integrated Long-Term Strategy reiterated this concern in their final report, which warned that

> In the coming decades the United States will
> need to be better prepared to deal with conflicts
> in the Third World. But they [preparations]
> require new kinds of planning, since they often
> call for missions, force structures, and equipment
> not now available in the U.S. inventory.[1]

Additionally, in recent years there have been both presidential and Congressional pressures for substantial reductions in defense spending in light of growing budget deficits, with warnings that "no real growth"

---

[1] <u>Discriminate Deterrence</u>, report of The Commission On Integrated Long-Term Strategy (Washington, D.C.: Government Printing Office, January 1988) p. 14. (Formed in 1987 by then-Secretary of Defense Caspar W. Weinberger as a blue-ribbon advisory panel on future defense strategy. The co-chairmen were Fred C. Ikle and Albert J. Wohlstetter.)

beyond the rate of inflation can be expected.[2] The fiscal year (FY) 1990 defense budget, submitted by the Bush administration in early 1989, called for no real growth (after inflation) in FY 1990, 1 percent real growth in FY 1991 and FY 1992, and a 2 percent real growth in FY 1993.[3]

After World War II, United States military strategy centered largely around containment of the two major communist powers, the Soviet Union and the People's Republic of China. Since the 1970s, improved relations with the People's Republic of China have lessened the threat from that quarter, leaving the Soviet Union as the primary focus for United States military strategy.[4]

Should the Soviet strategic nuclear threat, combined with Soviet conventional forces in Eastern Europe, continue to dominate United States military strategy and force planning, or is there a greater probability of conflict originating from the Third World into the next decade? Realizing the importance of this question and its impact on future foreign policy, military force structure, and constrained budgets, President Bush, in an address to Congress, asked for a review (subsequently called National Strategy Review #12) of "our [U.S.] national security policies and defense strategies with a view to ensuring compatibility among our commitments, strategies, capabilities, and resources."[5] In the view of former U.S. Navy Secretary James Webb, "The U.S. should rearticulate its military commitments and build an

---

[2] Fialta, John J. and Andy Pasztor. "New Pentagon Chief Must Prepare for a War Fought with Red Pencils and Green Eyeshades," Wall Street Journal, December 2, 1988, p. 16.

[3] "Highlights of the Budget," Washington Post, February 10, 1989, p. 18.

[4] Grey, Anthony W., Jr. and Eston T. White. Military Strategy, National Security Management Series (Washington, D.C.: National Defense University Press, 1983) p. 1 (hereafter, Grey and White).

[5] Halloran, Richard. "Calling for a Redesign of National Security," New York Times, April 2, 1989, p. E4.

optimum force mix around strategic and policy commitments that respond to strategic needs."[6]

The term "military strategy" can be defined in many ways and requires clarification for its use throughout this paper. The late Sir Basil Liddell Hart, Britain's famous strategist and tactician, defined it as "the art of distributing and applying military means to fulfil the ends of policy."[7] Field Marshal Earl Wavell, Commander-in-Chief of British Middle East forces in 1939, stated that "[military] strategy is the art of bringing forces to the battlefield in a favorable position."[8] Carl von Clausewitz defined it this way: "Tactics is the art of using troops in battle; [military] strategy is the art of using battles to win the war."[9] But the most lucid definition of military strategy may be that articulated by Grey and White: "the art and science of employing the armed forces of a nation to secure the objectives of national policy by the application of force, or the threat of force."[10] United States defense policy, as stated by then-President Ronald Reagan, "has been aimed at deterring aggression against the United States and its allies. Deterrence is the basis of our military strategy against conventional as well as nuclear aggression."[11]

---

[6] Morrocco, John D. "Shifting Economic, Political Tides Force Re-evaluation of Navy's Strategic Role," Aviation Week & Space Technology, February 27, 1989, p. 38.

[7] Hart, B. H. Liddell. Strategy (New York: Praeger, 1967) p. 335 (hereafter, Hart).

[8] As quoted by Esposito, Vincent J. "Military Strategy," in Encyclopedia Americana, vol. 25 (Danbury, Conn.: Grolier Inc., 1987) p. 772.

[9] Ibid.

[10] Grey and White, p. 1.

[11] The White House. National Security Strategy of the United States, Washington, D.C., 1988, p. 13.

1.1 PROBLEMS: BALANCING NEEDS AND RESOURCES

Among the problems faced by the U.S. Air Force is how to envision future warfighting in the Third World in order to train, organize, and equip its forces in concert with United States military strategy. Challenges arise in balancing weapons capabilities, personnel requirements, C^3I, and other supporting elements in light of current and projected research and development and budget limitations.

These problems can also be understood in the wider context of challenges to the Department of Defense (DoD):

- Identifying changes in Third World policies and environments that will have impact on future United States military force structure;

- Determining and defending to Congress the roles and responsibilities of the four services in future Third World conflicts;

- Identifying those technologies and capabilities that will best satisfy future defense needs in light of evolving Third World capabilities and increasingly constrained U.S. budgets;

- Balancing tactical and strategic assets in support of military forces across a wide spectrum of potential conflict; and

- Maintaining both flexibility toward evolving Third World threats and the ability to sustain a viable military deterrence.

1.2 ISSUES, STAKEHOLDERS, AND CONFLICTS

How should C^3I support future U.S. Air Force missions as it responds to political and military transformations ongoing throughout the Third World as well as to projected DoD budgetary constraints in the coming decade? Several stakeholders will be affected by the ways in which this issue and those related to it are resolved.

Within the U.S. Air Force, each of its individual commands, as well as those Air Force components that make up unified (multiservice) and combined (multinational) commands, must compete for resources in the

service budget. Additionally, the stakes of each command include retaining or improving its position as missions and roles change in order to maintain its influence and assigned responsibilities.

Not only does the Air Force face internal competition among its major commands and the various missions they support, but it must also compete with the Army, Navy, and Marine Corps within DoD for its share of the military budget. As missions and areas of conflict change, other services have stakes in the evolving strategy and supporting force structure.

The DoD competes with other governmental departments for what each perceives as an adequate share of the national budget, for the DoD must ensure that the military services have sufficient funds to support their missions and provide for national defense. The outcome of this balance is critical. As B. H. Liddell Hart eloquently stated, "[Military] strategy depends for success, first and most, on a sound *calculation and co-ordination of the end and the means*."[12]

Concerned by the juxtaposition of limited budgetary resources and a growing lethal Third World environment foreseen in the next decade, civilian and military policymakers have begun fundamental reexaminations of future United States military strategy in the Third World. Recent studies, including Discriminate Deterrence,[13] recommend developing capabilities that would reduce dependence on host-nation support for basing American forces near regions of conflict, limit exposure of United States forces to evolving Third World threats and, at the same time, maintain the capability to demonstrate national resolve.

Within this wide range of issues, this report focuses on the U.S. Air Force at that level of conflict requiring active intervention by combat forces, known as "peacetime contingency operations," extending through conventional (non-nuclear) war. It examines evolving strategy options

---

[12] Hart, p. 336 (original italics).

[13] Report of The Commission On Integrated Long-Term Strategy.

in light of the changing Third World environment and their implications for C^3I. In illustrating a number of fundamental C^3I issues inherent in all potential strategies of the future, the author focuses on one proposed Third World strategy and its associated C^3I problems and challenges.

As U.S. Air Force leaders assess potential regions and scenarios of conflict and develop a supporting force structure, a clear understanding of the corresponding C^3I issues is essential.

1.3 FUNDAMENTAL QUESTIONS

Underlying these problems and issues are several fundamental questions with no easy answers. The development of a realistic force structure and supporting infrastructure adequate for the potential needs of the next decade rests on how these questions are addressed by the U.S. Air Force, other armed services, defense industry leaders, and other civilian decision makers:

- Across what spectrum of conflict will the U.S. Air Force be expected to operate in future Third World conflicts? What part does C^3I play across that spectrum?

- What evolving political changes and military transformations do U.S. Air Force planners face in future conflicts waged in the Third World?

- What are the implications of the evolving Third World on future U.S. military strategy and corresponding C^3I challenges for the U.S. Air Force?

The goal in this report is to provide insight into these questions and the issues they involve. It is not the intent of the author to question the importance of the U.S. Air Force's strategic nuclear commitment, North Atlantic Treaty Organization (NATO) force requirements, or its responsibilities in other regions of conflict. Neither is it the author's purpose to prescribe a specific course or future strategy in the Third World. What is important, however, is for U.S. Air Force leaders and civilian policymakers to examine potential

U.S. military strategy options and to understand their implications on supporting C^3I policies. While this report examines C^3I issues focusing predominantly on the U.S. Air Force, it should be understood that these concerns can also be expanded to include all military services. The focus on the U.S. Air Force should not be interpreted as implying a reduced role of the Army and Navy in the evolution of future U.S. military strategy. The emerging Third World and related uncertainties generated by developments in Third World nations must be seriously evaluated by all U.S. military forces with the result being a multiservice, coordinated national military strategy.

A recurrent criticism of United States military strategy has been its orientation toward an East-West conflict and lack of a plan to deal with the Third World.[14] In the coming decade, U.S. Air Force and civilian policymakers will face fundamental questions regarding future U.S. military strategy in these regions of potential conflict. The Third World's changing military, political, and economic environments must be carefully evaluated and strategy and force structure properly tailored if they are to support a successful U.S. defense policy. This report is intended to provide a better understanding of the associated C^3I issues which are critical in implementing that future military strategy and force structure.

1.4 FRAMEWORK AND APPROACH

Chapter 2 outlines the U.S. Air Force's present roles and responsibilities with respect to the Third World and underscores the importance of effective C^3I across the entire spectrum of low-intensity conflict through conventional war. Given the growing importance of the Third World, these levels of conflict are a major consideration in developing future U.S. Air Force missions and their corresponding force structure. Currently, the Air Force is a primary participant across this

---

[14] Grey and White, p. 3.

spectrum, providing support that ranges from airlift of troops and supplies to space communications and reconnaissance.

Chapter 3 discusses evolving challenges U.S. Air Force planners would face in future conflicts waged in the emerging Third World, including modern arms, Intermediate Range Ballistic Missile (IRBM) proliferation, and a rapidly expanding nuclear and biological weapons potential. These significant capabilities represent grave concerns for military and civilian policymakers tasked with preparing U.S. forces for potential conflict in these pivotal and increasingly lethal regions of the world.

Chapter 4 examines significant C^3I issues, including the degree of intelligence filtering and analysis (fusion) at centralized (national) and regional (within a military theater of operation) levels; the need to achieve information integrity and control between these levels; options for balancing communications flexibility, redundancy, security, and interoperability across all four military services; and their implications on command and control (C^2). These are likely to be significant issues in efforts to formulate future U.S. Air Force missions and force structure for potential Third World conflicts.

Chapter 5 concludes with some fundamental questions for civilian policymakers and U.S. Air Force leaders tasked with supporting future U.S. military strategy and corresponding C^3I policies.

CHAPTER TWO

FUTURE SECURITY AND MILITARY CHALLENGES

2.1 INTRODUCTION

Potential Third World conflicts represent "major threat[s] to our [United States] political and economic interests and moral values well into the 21st century,"[15] stated then-Secretary of Defense Frank Carlucci. This chapter examines the increasing significance of the Third World, reiterates the continuing need for an effective U.S. Air Force capability and force structure across the entire spectrum of potential Third World conflict, and underscores the meaning and critical importance of effective command, control, communications, and intelligence (C^3I) in support of those forces.

2.2 SPECTRUM OF CONFLICT

"Third World" has become a collective phrase for those countries considered not part of the "First" (Western and Asian capitalist nations) or "Second" (Eastern Communist bloc nations) group of world nations. The countries that comprise the Third World share no common geography, religion, language, or culture. Instead, Third World membership suggests not only economic underdevelopment, but also major deficiencies in military, social, and political spheres.

Regardless of how they are categorized, these countries are becoming increasingly significant in world affairs, not only because they represent major sources of raw materials, including petroleum and minerals vital to the industries of the United States and other Western and Far Eastern nations, but also because of their often crucial geostrategic locations around the globe.

---

[15] Carlucci, Frank C., Secretary of Defense. Annual Report to the Congress Fiscal Year 1990 (Washington, D.C.: U.S. Government Printing Office, 1989) p. 43 (hereafter, Carlucci 1990).

The continued economic prosperity of the West and of numerous Asian and Pacific Rim nations depends directly upon the political and military stability of many of these Third World nations. While the Soviet Union meets its own primary energy and mineral needs from domestic sources, the United States must import virtually all of its required cobalt, bauxite, manganese, chromium, and platinum group metals, as well as a large percentage of its oil requirements (6.5 million barrels per day in 1987).[16] Japan must import 80 percent of its primary energy needs, 92 percent of its copper, and all of the petroleum, bauxite, cobalt, bauxite, manganese, chromium, and platinum group metals it requires.[17] The continued economic reliance on the Third World by Western as well as Asian nations into the next decade is clearly evident.

This growing industrial dependence, coupled with the expanding geostrategic importance of many Third World nations, has created an increased potential for future military confrontations capable of major disruptions to Western and Far Eastern economic and military security. All of the 22 wars ongoing worldwide in 1988 occurred in nations of the Third World.[18]

As a result, there has been a fundamental reevaluation toward revitalizing United States military strategy and force structure to cope with potential Third World conflicts. As noted by the former director of Central Intelligence, Admiral Stansfield Turner, USN, (Retired), "Our extensive preparations for war in Europe have left us [the United States] ill-prepared for lesser battles around the globe."[19] Earlier in this decade, the growing military importance of Third World nations was

---

[16] Sands, David R. "Soviets Still Lag Behind U.S. in Economic Race," Washington Times, November 22, 1988, p. 1.

[17] Ibid.

[18] Copeland, Peter. "Big Conflicts Waning, but Wars' Toll Is High," Washington Times, December 28, 1988, p. 6.

[19] Turner, Stansfield. "Arm for the Real Threats," New York Times, April 10, 1989, p. A15.

also articulated by Rear Admiral Robert J. Hanks, USN, (Retired), who
stated that

> the focus of Free World security has undergone a
> perceptible shift from the plains of Northern
> Europe to the poorly understood geographic and
> political terrain of the Third World.[20]

Future consequences of potential military confrontations between the
United States and nations of the Third World were identified by The
Commission On Integrated Long-Term Strategy, which stated that

> [Third World conflicts] are obviously less
> threatening than any Soviet-American war would
> be, yet they have had and will have an adverse
> cumulative effect on U.S. access to critical
> regions, on American credibility among allies
> and friends, and on American self-confidence.[21]

Currently, the U.S. Air Force maintains forces intended to respond
across the entire range of potential military intervention in the Third
World (see **Figure 2-1**), from the "low-intensity conflict," or LIC level
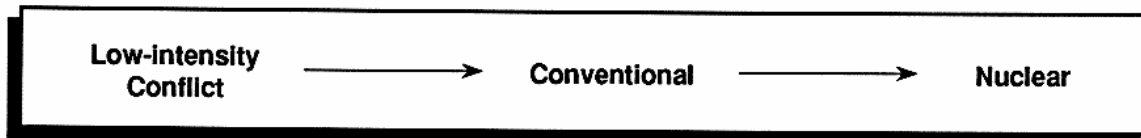of participation, through full-scale conventional (non-nuclear) war.

Figure 2-1

Spectrum of Conflict

---

[20] Record, Jeffrey and Robert J. Hanks. U.S. Strategy at the
Crossroads: Two Views (Cambridge, Mass.: Institute for Foreign Policy
Analysis, 1982) p. 37 (hereafter, Record and Hanks).

[21] Report of The Commission On Integrated Long-Term Strategy,
p. 13.

The term "LIC" includes insurgency and counterinsurgency, peace-keeping forces, anti-terrorism, and peacetime contingency operations.[22]

According to then-Secretary of Defense Frank C. Carlucci, "[The United States'] global strategy for deterring and combatting aggression must be effective across the spectrum of conflict, from nuclear and conventional aggression to what is now termed low-intensity conflict, or LIC."[23] He went on to say that "although our [United States] conventional forces are structured primarily to counter the Soviet threat, they must also be prepared to deter and, if need be, actively combat aggression at the lower end of the conflict spectrum."[24]

Former Secretary of Defense Caspar Weinberger, in his FY 1988 Annual Report to the Congress, warned of continued Third World violence and its threat to Western democracy:

> Today there seems to be no shortage of
> adversaries who seek to undermine our security
> by persistently nibbling away at our [U.S.]
> interests through these shadow wars carried on
> by guerrillas, assassins, terrorists, and
> subversives in the hope that they have found a
> weak point in our defenses.[25]

He asserted that, unless the United States adopts a comprehensive "national strategy" to combat low-level wars, "these forms of aggression

---

[22] Joint U.S. Army Field Manual 100-20 and U.S. Air Force Manual 2-20, Military Operations In Low-Intensity Conflict, final draft (Washington, D.C.: The Pentagon, 1988) p. 1-10 (hereafter, Military Operations In Low-Intensity Conflict).

[23] Carlucci, Frank C., Secretary of Defense. Annual Report to the Congress Fiscal Year 1989, executive summary (Washington, D.C.: The Pentagon, 1988) p. 15.

[24] Ibid, p. 20.

[25] Klare, Michael T. and Peter Kornbluh, eds. Low Intensity Warfare (New York: Pantheon Books, 1988) p. 4; as quoted from Department of Defense Annual Report, Fiscal Year 1988, p. 57, 62 (hereafter, Klare and Kornbluh).

will remain the most likely and the most enduring threats to our [United States] security."[26]

The potential of future Third World conflicts will continue to confront United States military strategy well into the next century. Economic demands for raw materials by the West and other developed countries, ongoing political instability (both Soviet-inspired and otherwise), and the proliferation of sophisticated arms all contribute to the specter of future military conflict throughout the Third World. This long-term realization was reiterated by The Commission On Integrated Long-Term Strategy, which stated:

> Many of our [U.S.] problems in the Third World
> are centered on what is now called "low-
> intensity conflict." To defend its interests
> properly in the Third World, the United States
> will have to take low-intensity conflict much
> more seriously. We now have to think of [the
> Third World] as a permanent addition to the menu
> of defense planning problems.[27]

LIC includes that level of conflict requiring active intervention by U.S. combatant forces, known as "peacetime contingency operations." Peacetime contingency operations are normally characterized by short-term, rapid projection or employment of forces in conditions short of war.[28] At these levels of conflict, current U.S. Air Force participation can include

- Strategic (long-range) and tactical (short- to medium-range) airlift,

- Strategic conventional bomber forces,

- Tactical bomber and fighter forces; and

- Strategic and tactical reconnaissance forces; and

- Space-based sensors and communications.

---

[26] Ibid.

[27] Report of The Commission On Integrated Long-Term Strategy, pp. 14-15.

[28] Military Operations In Low-Intensity Conflict, p. 5-1.

As examined in greater detail in subsequent chapters, the effectiveness
of these traditional forces in future Third World conflicts, given their
associated forward-basing, logistical, manpower, and other infrastruc-
ture requirements, may become increasingly limited in light of fundamen-
tal changes ongoing throughout many nations in the Third World today.

In the coming decade, the U.S. Air Force is likely to increase its
dependence on advanced technologies to enhance its Third World
conventional capability and to ensure a credible deterrent force in
future conflicts. Potential areas for technology application include

- Surveillance and reconnaissance,

- Weapons guidance and delivery,

- Communications, and

- Intelligence filtering and analysis (fusion).

Given that advanced technology systems are integrated into United States
military strategy and evolving force structure, the success of the U.S.
Air Force in the Third World will increasingly depend upon the
effectiveness of its C^3I across the entire spectrum of conflict.

2.3 COMMAND, CONTROL, COMMUNICATIONS AND INTELLIGENCE (C^3I): A CRUCIAL ELEMENT OF STRATEGY

This study examines two aspects of "C^3I": the _process_ of C^2 which
commanders employ in "the exercise of authority and direction ... in
planning, directing, coordinating and controlling" their assigned
forces, and the supporting _systems_, including "personnel, equipment,
communications, facilities, and procedures" that allow the commander to
carry out the C^2 process.[29] The author includes intelligence systems
and organizations as part of those "systems" needed to support the
commander as part of his C^2. (See this report's appendix for a more

---

[29] The Joint Chiefs of Staff, JCS Publication 0-1. Department of
Defense Dictionary of Military and Associated Terms (Washington, D.C.:
Government Printing Office, 1987) p. 77.

detailed explanation of the term "C^3I" and the various interpretations
of the term by different organizations and commanders.)

Then-Secretary of Defense Frank Carlucci, in his FY 1990 Annual
Report to the Congress, stated: "Despite our [United States] best
efforts, at times our attempts to combat low-intensity aggression may
fail. In such instances, we must be prepared to employ our [United
States] military strength assertively."[30] This will require a force
that is capable of acting quickly, decisively, and with flexibility
across the entire spectrum of conflict. As reiterated by Rear Admiral
Hanks:

> [M]ilitary capability will often be ineffectual
> unless it features the all-important attribute
> of timeliness. Across the centuries, the
> historical record of armed interventions reveals
> that, generally, the sooner the sanction of
> military power can be invoked, the smaller the
> force required to achieve success.[31]

To support his forces adequately, the commander's C^3I must also possess
these same attributes of timeliness and flexibility across the full
range of conflict. Future warfare in the Third World has the potential
to escalate quickly, requiring responsive and effective C^3I at all
levels. According to Niel Ferraro, systems director for Unisys
Corporation, future C^3I challenges exist in the coming decade because

> tactical and strategic systems will demand
> better system coordination in the 21st century.
> Prioritization is becoming a very complicated
> problem for military field personnel, who can
> easily be confused in an operational environment
> about the locations of friendly and enemy
> forces.[32]

---

[30] Carlucci 1990, p. 43.

[31] Record and Hanks, p. 47.

[32] "Smarter Data Systems Required," Defense Electronics, May 1989,
p. 10.

With the advent of increased sophistication in current Third World military forces, these factors become even more critical. In describing the evolving environment of the Third World, Klare and Kornbluh point out that

> we must also recognize that the growing
> worldwide availability of high-tech conventional
> weapons is systematically eroding the gap
> between "low-" and "mid-intensity conflict," and
> likewise between "mid-" and "high-intensity
> conflict."[33]

The next chapter explores this ominous trend of growing lethality and other transformations occurring throughout the Third World -- and their implications for the structuring of future forces and C^3I policies.

---

[33] Klare and Kornbluh, p. 18.

CHAPTER THREE

THE EMERGING THIRD WORLD

3.1 INTRODUCTION

This chapter examines four general categories of change currently underway throughout many Third World nations. Some have been ongoing for several decades, while others are becoming evident only today. They represent major challenges that the U.S. Air Force may face if it becomes involved in future Third World conflicts. In general, these categories of change can be viewed as representative of an overwhelming trend toward a multipolar world of the future, where no longer just the United States and Soviet Union are considered the major powers. A report of The Commission On Integrated Long-Term Strategy projected that by 2010 "a world with three or four major, global military powers" may exist "[and] would confront American strategic planners with a far more complicated environment."[34] It went on to forecast that, in the early 21st century, "many lesser powers will have sizable arsenals," and among those will be "India, Brazil, South and North Korea, [and] Egypt."[35]

3.2 POLITICAL UNCERTAINTIES

Increasing political uncertainties throughout a growing number of Third World nations will have long-range implications on future U.S. Air Force requirements and force structure. In the past, the United States has depended on overseas forward operating bases to position its forces close to areas of potential conflict, a posture called "forward defense." This basing structure has tended to shrink over time, partly from considerations of efficiency, but also due to political changes

---

[34] Report of The Commission On Integrated Long-Term Strategy, p. 7.

[35] Ibid., p. 9.

that have deprived the United States access to countries such as South Yemen, Libya, Ethiopia, Iran, and Vietnam.[36]

More recently, U.S. Air Force, Army, and Navy facilities in Spain, Portugal, Greece, the Philippines, South Korea, and other locations are being threatened by national movements demanding the removal of all or part of United States forces from the host country. In 1987, the U.S. Air Force's 401st Tactical Fighter Wing and its 72 F-16 aircraft were directed to leave their Spanish base at Torrejon by spring of 1991. Italy has tentatively agreed to allow the wing to relocate on its soil with NATO paying all moving expenses, estimated at $760 million. The remaining United States bases in Spain will not be affected at present. Torrejon will become an all-Spanish base unavailable for future use by United States forces.

Portugal has since been added to the list of Mediterranean countries that are posing future base access problems. The existing bilateral agreement between the United States and Portugal is scheduled for renewal in 1991. In 1988, the new Portuguese government of Cavaco Silva openly threatened to curtail United States access to the key Portuguese air base at Lajes in the Azores unless a substantial increase in security assistance is approved.[37] Lajes Air Base serves as one of the most critical staging bases for deploying United States forces to Europe and the Middle East. It functions as a vital refueling station for Military Airlift Command transport aircraft. Portugal was among the few NATO countries that allowed the United States to use its facilities during the 1973 Middle East War and the resupply effort for Israel.[38] Its loss would strike a critical blow to future United States deployment

---

[36] Office of the Secretary of Defense. Soviet Military Power: An Assessment of the Threat 1988 (Washington, D.C.: Government Printing Office, 1988) p. 139.

[37] Snyder, Jed C. "Bases in Jeopardy," Air Force Magazine, October 1988, p. 67.

[38] Ibid.

and resupply capabilities in support of future Third World and European conflicts.

Facilities in Greece, the Philippines, and South Korea are in even more serious peril. In Greece, Prime Minister Andreas Papandreou's policies have set the stage for a confrontation with the United States over American bases located there. The five-year operating agreement for United States forces and facilities located in Greece expired on December 20, 1988. Papandreou warned that renegotiations must start, "from ground zero."[39] Unless a new agreement is signed, the dismantling of 4 large and 20 smaller American bases in Greece over a 17-month period will begin.[40] United States-leased bases in Greece have been, for some years, in danger of closing because of increasing political unrest and growing terrorist activities. This most current threat by the Greek government is due, in part, to American and European protests over Greek Justice Minister Vassilis Rotis' refusal to extradite to Italy Osana Abdel al-Zomar, an alleged terrorist.[41]

The United States' continued access to forward operating bases located in the Philippines is in similar jeopardy. The anti-American feelings in the Philippines derive primarily from past United States support of Ferdinand Marcos, as well as from the impact of the local communist insurgency. Philippine President Corazon Aquino stated on November 29, 1988, that any extension of leases on American military facilities in her country would have to be negotiated by 1991 -- a year earlier than United States officials had anticipated.[42] Renewal of the treaty would have to be ratified by the Philippine Senate -- a majority

---

[39] Hickey, Mary C. and George Howe Colt. "End of an Era," Life, April 1988, p. 36.

[40] Walcott, John and Robert S. Greenberger. "New Strains Beset U.S.-Greek Relations as Negotiations on Bases Get Under Way," Wall Street Journal, December 13, 1988, p. 17.

[41] Ibid.

[42] Beeston, Richard. "Philippines Steps Up Lease-Renewal Timing," Washington Times, November 30, 1988, p. 9.

of whose members are hostile to the American military presence.[43] Even
if a new treaty is negotiated, future problems may jeopardize United
States military forces operating in the Philippines if proposals are
approved, such as a current bill before the Philippine Senate which bans
the "development, manufacture, acquisition, testing, use or storage of
nuclear arms and components as well as the entry of any nuclear armed or
powered ship, plane or overland vehicle."[44] The United States
terminated its 38-year old military pact with New Zealand over a similar
situation in 1985 when that country banned from its harbors American
naval ships carrying nuclear weapons.[45]

Notwithstanding a possible future agreement, indications point toward
the eventual loss of a permanent United States military presence in the
Philippines. The Philippine Foreign Secretary Raul Manglapus stated in
1989 that "whatever the developments, we are preparing for the eventual
conversion of U.S. facilities to civilian use."[46] Other Asian countries
see similar prospects. The Singapore Prime Minister, Lee Kuan Yew,
stated that he and other Southeast Asian leaders are now "emotionally
prepared for an end of the [U.S. military] bases in the not too distant
future."[47]

American presence in South Korea, including the 43,000 United States
troops stationed there, is also being reassessed, not because of
specific grievances against the United States, but due in large part to
the rising nationalism tied to South Korea's growing economy and its
desire to pursue closer ties with its neighbor and current enemy, North

---

[43] Ibid.

[44] Del Mundo, Fernando. United Press International Release, April
26, 1988.

[45] Clark, David Scott. "Jilted by U.S., Antinuke New Zealand Finds
Own Way in Military Buildup," Christian Science Monitor, April 13, 1988,
p. 7.

[46] Lerner, Marc. "Philippines Preparing to Convert U.S. Bases,"
Washington Times, January 18, 1989, p. 7.

[47] Ibid.

Korea. South Korean President Roh Tae Woo said in his New Year message that, "1989 is expected to bring a decisive moment in which the wall of confrontation between South and North Korea will be torn down."[48] The South Korean government later announced that the joint United States-South Korean annual military exercise, called "Team Spirit," would be scaled back as a conciliatory gesture toward North Korea.[49]

The importance of forward operating bases near the scene of a conflict in support of one's forces cannot be overemphasized. The British learned this bitter lesson during the Falklands/Malvinas conflict in 1982 when they were faced with an 8000-mile supply line to sustain their committed naval forces.[50] It was demonstrated again in April 1987 when the United States sent naval forces into the Persian Gulf in response to Iranian attacks on oil shipping in international waters.

Vice Admiral Henry Mustin, USN, stated that the Navy's operations in the Persian Gulf were complicated by a lack of land bases for resupply and maintenance.[51] Even though numerous Persian Gulf nations welcomed the United States naval presence there, they did not want Americans on their soil because of domestic political considerations.[52] Thus, the Navy had to resort to a sea-based logistical support system. Resupply and maintenance ships were sent to the Gulf, and repairs were made at sea while underway. The repair ships were in turn supported by a World

---

[48] Hiatt, Fred. "South Korea May Cut Joint U.S. Exercises," Washington Post, January 9, 1989, p. 21.

[49] Ibid.

[50] For a deeper study of the Falklands/Malvinas conflict, see Gladys D. Ganley and Oswald H. Ganley, Unexpected War in the Information Age: Communications and Information in the Falklands Conflict, (Cambridge, Mass.: Program on Information Resources Policy, Harvard Univ., 1984), (hereafter, Ganley and Ganley).

[51] Trainor, Bernard E. "Navy Sees Gulf Activity as Portent of New Era," New York Times, November 25, 1988, p. B-10.

[52] Ibid.

War II-type ocean convoy, which completed the supply chain back to the United States.

The resupply effort was a tremendous undertaking, playing a crucial role in the success of the Persian Gulf conflict. Yet, without the ability to accomplish necessary resupply and repair using other ships and maintenance barges, the Persian Gulf operation would have failed for lack of forward operational bases.

A growing tide of political and military independence throughout many pro-Western and European nations, encouraged in part by the Soviet Union's new purported military policy of eliminating offensive forces as part of *glasnost* (or openness) and the strengthening of the 12-member European Common Market by 1992, may have important consequences for future United States military strategy in the coming decade. An expanding sense of nationalism and Europeanism, coupled with a relaxation toward the Warsaw Pact, may further loosen the NATO alliance, resulting in additional scrutiny of U.S. military strategy, especially concerning the Third World. This sobering trend was demonstrated during the United States air strike against Libya on April 14, 1986, in retaliation, in part, to a terrorist bombing of a West German discotheque. Despite intelligence reports linking Libya's support and finance of this and other acts of terrorism in Europe and the Middle East, none of the United States' European allies, with the exception of Great Britain, supported the retaliatory raid. France, Spain, and Portugal specifically refused overflight rights to the F-111 aircraft participating in the strike.[53]

During the Persian Gulf conflict, Great Britain, France, the Netherlands, Italy, and West Germany refused to support United States efforts.[54] Two months later, European allies reversed their position

---

[53] Bhatia, Kiki. "The Reluctant Cowboy," The Heritage Foundation Policy Review, no. 46, Fall 1988, p. 54.

[54] Ibid.

when increased naval mining and attacks on shipping threatened European oil supplies.

This increasing propensity to question U.S. policy throughout many Western and Third World countries may have significant effects on future U.S. Air Force missions and supporting force structure. Third World forward basing, political support, and assistance toward United States forces involved in military operations could be met with greater scrutiny and skepticism in the future.

3.3 ARMS AVAILABILITY AND MODERNIZATION

Increasing availability and proliferation of modern, highly lethal weaponry throughout the Third World today will have far-reaching implications for future U.S. Air Force strategy and may result in fundamental changes in the United States' ability to project its military power in support of national interests abroad. This observation was reiterated by The Commission On Integrated Long-Term Strategy which stated that "in the years ahead, weapons production will be much more widely diffused, and the superpowers (especially if there are three or four) will have less control over transfers of advanced systems. Many lesser powers will have sizable arsenals."[55]

Initially, after World War II, the United States and the Soviet Union were the world's major arms producers and exporters, with transfers limited primarily to their respective allies and close friends. By 1974, the world arms trade had grown to 10 times its level in 1959.[56]

Starting in the mid-1970s, an expanding shift occurred in the world arms trade arena. The Third World began capturing a growing share of the world's arms export market, with their exports rising from $1.5

---

[55] Report of The Commission On Integrated Long-Term Strategy, p. 9.

[56] Ely, II, Edward S., Captain, USAF, Arms Transfers and the Third World: Trends and Developments (Langley AFB, Va.: Army-Air Force Center for Low-Intensity Conflict, 1988) p. 3.

billion to $8.5 billion between 1974 and 1985.[57] This production and
export accelerated the already skyrocketing pace of arms transfer to the
Third World, which grew by 25 percent between 1974 and 1979.[58] The
leaders of this rapid increase in production by Third World nations
included China, Brazil, Egypt, and India. Military arms production has
become a very lucrative market for exporting nations. Not only does it
result in an excellent source of foreign currency, but it also provides
a ready source of modern weapons and associated material for the
manufacturing country's military forces. The Indian Defense Minister,
Krishna Chandra Pant, stated that "[Indian arms manufacturers] have the
potential to capture a part of the international market in weapons,
equipment and systems, and vigorous efforts should be made to utilize
this potential."[59]

The greatest recipient of modern arms transfer has been the Middle
East, with Iraq, Saudi Arabia, Libya, Syria, and Iran purchasing 45
percent of the flow of arms into the Third World between 1975 and
1985.[60] This has been due, in large part, to the political instability
of that region and the large sums of money available to these nations
from oil revenues. In contrast, NATO and Warsaw Pact arms exports to
Third World nations have declined by 30 percent and 25 percent,
respectively, between 1983 and 1985.[61]

With modern arms widely available, nations who develop the necessary
technologies and manufacturing expertise for arms development and export

---

[57] O'Neill, Robert, et al. The Military Balance 1987-1988 (London:
The International Institute for Strategic Studies, 1987) p. 239
(hereafter, O'Neill).

[58] Kemp, Geoffrey and Stephen Miller. "The Arms Transfer
Phenomenon," in Arms Transfers and American Foreign Policy, ed. Andrew
J. Pierce (New York: New York University Press, 1979) p. 16.

[59] Hazarika, Sanjoy. "India Plans to Increase Arms Imports and
Exports," New York Times, February 5, 1989, p. 6.

[60] Sivard, Ruth Leger. World Military & Social Expenditures 1987-
1988 (Washington, D.C.: World Priorities, 1987) p. 10.

[61] O'Neill.

risk being confronted with their own technology during military conflicts. An excellent example of this predicament came during the Falklands/Malvinas conflict in which British forces faced an Argentine navy made up of old but updated American, British, and West German-built ships and submarines fitted with modern missiles and torpedoes, many of British make.[62] At least six Argentine ships were equipped with French *Exocet* surface-to-surface missiles and British *Sea Cat* missiles for surface-to-air defense.[63] These easily obtainable, modern arms allowed Argentine to challenge and almost defeat a world power.

Another example of a Third World nation successfully challenging a superpower with inexpensive, readily available weaponry is the Afghan resistance forces after the modern Soviet Air Force invaded Afghanistan in December 1979. In the early stages of the war, the Afghan resistance's only anti-aircraft capability, beyond small arms, was provided by a few captured Degtyarev-Shpagin-Kalashnikov (DShK), nicknamed *Dashika*, heavy machine guns.[64] Despite some success by the rebels in downing Soviet aircraft during the first five years of occupation, Soviet tactics did not appreciably change. In 1984, the Central Intelligence Agency (CIA) reportedly began providing the Afghan resistance with the Soviet-designed SA-7, a shoulder-held, man-portable, infrared seeker missile.[65] It was limited in performance to a close-range, rear-aspect engagement only.

Additionally, at about the same time as the introduction of the SA-7, an unspecified number of Blowpipe missiles, built by Short Brothers of Great Britain, were also provided to the Afghan resistance by either Saudi Arabia or Oman.[66] Both had only limited effectiveness

---

[62] Ganley and Ganley, p. 9.

[63] Ibid.

[64] Rawles, James W. "Stinger in Afghanistan," Defense Electronics, November 1988, p. 32 (hereafter, "Stinger in Afghanistan").

[65] Ibid.

[66] Ibid.

against Soviet aircraft. It was not until the introduction of United States-produced Stinger missiles in the summer of 1986 that shoulder-fired missiles had a major effect on the conflict. The Stinger provided a much improved, all-aspect (front, side, as well as rear) engagement of a target aircraft.[67] By April 1988, an estimated 250 Soviet and Afghan Air Force aircraft (85 percent helicopters) had been downed by Stingers.[68] This record was achieved despite extensive use of flare countermeasures to confuse and decoy the missiles.

With the successful use of Stingers by the Afghan resistance, Soviet forces significantly altered their subsequent tactics by restricting the use of helicopters in providing fire support for ground operations and requiring their fighter bombers to fly at extremely high altitudes (above 20,000 feet), thus reducing their effectiveness.[69] This ability to limit severely Soviet air superiority greatly increased the Afghan resistances' effectiveness against Soviet and Afghan ground troops, thus significantly influencing the outcome of the conflict.

Foreign-made, man-portable missiles are easily available in the Third World, and the United States is a major contributor to their proliferation. It currently exports the Stinger missile to 14 countries.[70] Libya has provided Soviet-made SA-7 shoulder-fired missiles to terrorist organizations as well. In 1987, Libyan arms, including SA-7s, were confiscated on a freighter in the English Channel bound for the Irish Republican Army (IRA).[71] At least four other shipments from Libya are said to have reached the IRA in 1985 and

---

[67] Rawles, James W. "Stinger: Requiem for the Combat Helicopter?", Defense Electronics, November 1988, p. 32.

[68] Ibid.

[69] Rawles, "Stinger in Afghanistan," p. 33.

[70] Ibid.

[71] Morrison, James. "Qaddafi Hands Soviet Missiles to IRA, Police Believe," Washington Times, November 22, 1988, p. 1.

1986.[72] Effective, high-technology ground-to-air portable missiles
costing less than $100,000 are capable of turning any Third World nation
or terrorist group into a formidable foe, able to challenge
successfully, as did the Afghan resistance, the air force of a
superpower.

A more technologically sophisticated and ominous capability spreading
throughout a growing number of Third World countries, especially in the
Middle East, is the threat of Intermediate Range Ballistic Missiles
(IRBM). These have the potential of giving any Third World country a
truly strategic offensive capability (see **Table** 3-1).

Currently, Syria is acquiring highly accurate, Soviet-provided SS-21
missiles, and Saudi Arabia possesses the less accurate Chinese CSS-2
intermediate-range missiles with a range of 1600 miles and a payload
capability of 4500 pounds.[73] Iraq has taken the initiative and
successfully modified the Soviet SS-1 *Scud* missile to an increased range
of 190-560 miles, and Egypt is busily perfecting its own missile, the
500-nautical-mile range *Badr-2000*, with the help of Iraq and
Argentina.[74] With their newly acquired capabilities, these countries
can easily threaten the entire Middle East, including any United States
or allied forces deployed to the region (see **Figure** 3-1). During the
Iran-Iraq War, both participants launched more than 150 intermediate-
range missiles to attack military and civilian targets in the cities of
Baghdad and Tehran.[75]

---

[72] Ibid.

[73] Ottaway, David B. "Middle East Weapons Proliferate," Washington
Post, December 19, 1988, p. 1 (hereafter, Ottaway).

[74] Ibid. See also "U.S. Presses Mideast Missile Talks," Washington
Post, December 28, 1988, p. 15.

[75] Neuerbourg, Hanns. "Tehran Prepares for a Gas Attack,"
Washington Times, April 1, 1988, p. 9.

Table 3-1

**Nuclear-Capable Ballistic Missiles
in the Third World**

Missile	Who Has Them	Who Made Them	Range	Status
Scud-B	Iran Iraq Libya Syria South Yemen Egypt	Soviet Union North Korea	190 mi	Deployed
SS-12	Iraq	Soviet Union	500 mi	Deployed
CSS-2	Saudi Arabia	China	1,600-1,860 mi	Deployed
M-9	Iran (?) Syria (?)	China	125-375 mi	Testing
Jericho II	Israel	Israel	400 mi	Deployed
Jericho IIB	Israel	Israel	900 mi	Testing
SS-300	Brazil Iraq (?)	Brazil	190 mi	Testing
Orbita	Brazil Libya (?)	Brazil	375 mi	R&D
Condor II	Argentina Egypt (?) Iraq (?)	Argentina	500 mi	R&D

(?) - Countries reported to be seeking the missile indicated.
R&D - Research and Development

"Nuclear Capable" is defined as those missiles with a range > 190 miles and a payload > 1100 lbs.

Data from: *The Undeclared Bomb*, Leonard S. Spector, Cambridge, Mass.: Ballinger, 1988, p. 60.

Concerned with the growing Arab threat, Israel is improving its present *Jericho II* IRBM capability. The *Jericho IIB* surface-to-surface missile is under development with a projected range of 940 miles.[76]

---

[76] "Jane's Reports 2nd Test of Israeli Missile," Washington Times, November 17, 1988, p. 2.
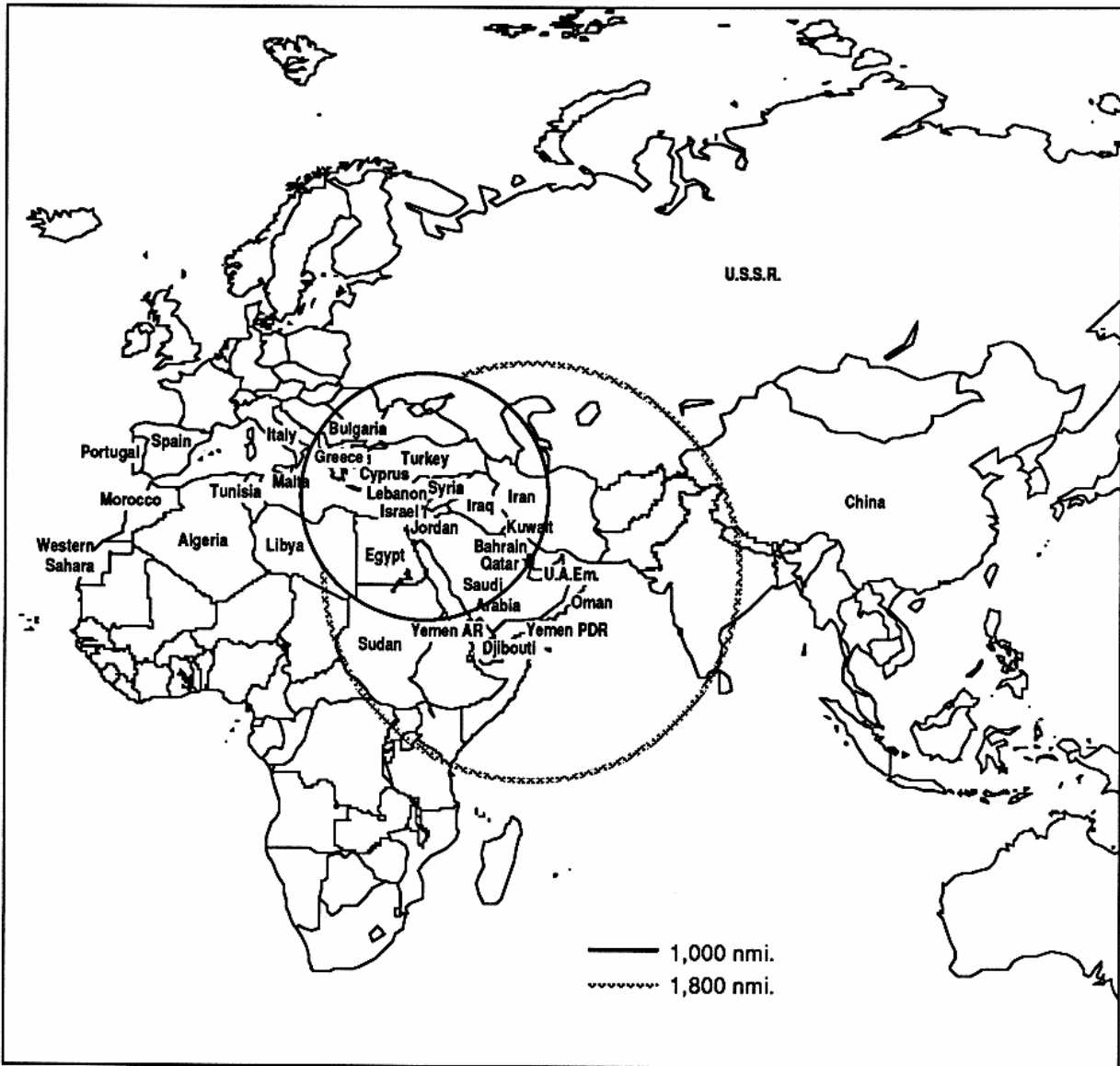
Figure 3-1

Middle East and Representative Missile Ranges

To counter this rapidly expanding offensive threat, a number of
Middle East countries are pursuing an anti-missile capability against
the IRBM, designated the Anti-Tactical Ballistic Missile (ATBM).
Israel, in conjunction with the United States, is currently working on a
next-generation replacement anti-missile to its present *Arrow* ATBM.   In

addition, Iraq is developing its own anti-tactical missile capability and has tested a prototype.[77]

Intermediate Range Ballistic Missiles are not limited to Middle Eastern countries. The government of Afghanistan is scheduled to receive longer range replacements for the Soviet-made SS-1 *Scud* missiles it had originally received.[78] These would be capable of reaching Pakistan, which has served as a sanctuary for Afghan resistance forces. Pakistan, to the concern of India, announced it successfully tested its first missile with a range of 185 miles and a payload of 1100 lbs.[79] Additionally, Libya has ordered IRBMs from Brazil which will give that North African nation a much-improved offensive strike capability.[80] Despite a series of setbacks during testing, India successfully launched its new *Agni* IRBM on May 22, 1989.[81] The new missile is capable of carrying a 2000-pound warhead 1560 miles.[82]

The proliferation of intermediate-range missiles has not gone unnoticed by major world nations. During a September 8-9, 1988, meeting in Rome, the United States, Great Britain, France, West Germany, Italy, Canada, and Japan met to discuss the growing IRBM threat. This meeting was the result of a seven-nation accord signed earlier in April 1987, aimed at controlling the spread of intermediate-range missiles and their

---

[77] Ottaway, p. 1.

[78] "Soviets to Boost Kabul Arsenal," Washington Times, November 15, 1988, p. 8.

[79] "Pakistan Claims Long-Range Rocket Capability," Washington Times, February 6, 1989, p. 11.

[80] "The Missiles of the Middle East," St. Louis Post-Dispatch, November 9, 1988, p. 2C.

[81] "New Delhi Successful in Test Firing of Missile," Boston Globe, May 23, 1989, p. 2.

[82] "India Boosts Its Missile Power," Washington Times, April 18, 1989, p. 2.

associated technologies.[83] Of particular concern during the seven-
nation meeting was the ongoing development by Argentina of its *Condor II*
IRBM, with an estimated range of 500-600 nautical miles.[84] The missile
was developed with technical assistance from Egypt and financial aid
from Iraq. After the seven-nation conference of September 1988, the
Argentine Air Force announced it successfully tested a surface-to-
surface missile on December 21, 1988.[85] It is likely that this weapon
will be exported to the Middle East when production begins.[86]

With the widespread availability of intermediate-range missiles and
their associated technologies, it is estimated that as many as 15 Third
World countries will have the capability to manufacture these long-
range weapons by the end of the next decade.[87] This proliferation will
make IRBMs easily accessible to any Third World nation desiring a
strategic strike capability.

Modern arms and weapon technologies, given their increasing
proliferation throughout the world, have the potential to elevate Third
World nations to military parity with superpower nations involved in
regional conflicts. This ominous capability must be seriously
considered by U.S. Air Force strategic planners and could fundamentally
alter the United States' ability to deploy and sustain forces in Third
World conflicts.

---

[83] Oberdorfer, Don. "U.S. Seeks to Curb Argentine Missile
Project," Washington Post, September 19, 1988, p. A6 (hereafter,
Oberdorfer).

[84] Ibid.

[85] Department of Defense, Armed Forces Information Service.
"Argentina/Missile Test," Current News Early Bird Edition, December 23,
1988, as quoted from the Spanish News Agency dispatch dated December 22,
1988.

[86] Ibid.

[87] Oberdorfer.

3.4 CHEMICAL/BIOLOGICAL THREAT

A growing number of Third World nations are manufacturing or
acquiring an increasingly dangerous chemical and biological warfare
capability. The proliferation of these inexpensive and easy-to-obtain
weapons may result in fundamental changes to U.S. Air Force forward-
basing and deployment strategies in support of future military
operations in those regions of the world. Then-Secretary of State
George P. Shultz has warned: "The worst nightmare of all would be the
eventual combination of ballistic missiles and chemical weapons in the
hands of governments with terrorist histories. These weapons increase
the potential for devastation in unstable regions of the Third World."[88]

Even though the use of chemical weapons in war was advocated in the
early 1800s, they were not utilized on a grand scale until World War I.
Initial use during that conflict was by the French in tear-gas grenades
against the Germans, who retaliated with tear-gas artillery shells in
1914.[89] On April 22, 1915, the Germans launched the first effective use
of chemical warfare, a chlorine gas attack against the French and
British colonial troops in the trenches around Ypres.[90] It resulted in
20,000 casualties, of which 5000 were fatal.[91] For the whole of World
War I, gas warfare casualties totaled 1,296,853 men, of whom 91,198 were
killed.[92]

The full extent and horror of this new kind of warfare used
throughout World War I by both Allied and German forces led to the 1925

---

[88] Before the Commonwealth Club of San Francisco, October 28, 1988,
as quoted by George Gedda, "Shultz Warns of Spread of Ballistic
Missiles, Chemical Weapons," The Associated Press, October 29, 1988.

[89] Cookson, John and Judith Nottingham. A Survey of Chemical and
Biological Warfare (New York: Monthly Review Press, 1969) p. 5
(hereafter, Cookson and Nottingham).

[90] Ibid.

[91] Ibid., p. 283.

[92] Ibid., p. 286.

Geneva Protocol, which outlawed the use, but not the possession or manufacture, of chemical and biological weapons. Twenty-nine countries signed the protocol originally, but six failed to ratify it.[93] In spite of favorable reception by the Departments of War and Navy and the Senate Foreign Relations Committee, the protocol was refused ratification by the United States Senate in January 1926.[94] (The United States subsequently became the 95th nation to ratify the Geneva Protocol in 1975.)

There have been numerous allegations of biological weapons use since World War II, but none has been authenticated. Although biological weapons have not been utilized extensively in warfare, Germany and Japan "prepared" for their use in World War II.[95] The development, production, possession, and transfer of biological weapons have since been outlawed by the 1972 Biological Weapons Convention. Still, according to William H. Webster, director of the Central Intelligence Agency, at least 10 nations are actively working on biological weapons.[96]

Since World War I, there have been only a few documented incidents of chemical weapons in combat. These include the use of mustard gas sprayed from aircraft by the Italians against the Ethiopians in 1936, by Japan between 1937 and 1943 when it invaded China, and the use of gas by the Egyptians in Yemen between 1963 and 1967.[97] During the last decade, there have been unconfirmed reports by United Nations medical teams of

---

[93] Ibid., p. 141.

[94] Ibid., p. 143.

[95] Cookson and Nottingham, p. 296.

[96] Before the World Affairs Council in Washington, D.C., October 25, 1988, as quoted by Stephen Engelberg, "C.I.A. Chief Says Libya Develops a Huge Chemical Weapons Plant," New York Times, October 26, 1988, p. 10.

[97] Cookson and Nottingham, pp. 283-312.

nerve gas use in Afghanistan, Cambodia, and Angola.[98] Today, as shown in **Table 3-2**, 23 nations are known to possess or to be attempting to acquire chemical weapons.

Table 3-2

Nations Possessing or Desiring Chemical Weapons

Known to Have		Attempting to Acquire	
United States	Iran	Afghanistan	India
Soviet Union	Israel	Argentina	Laos
Iraq	Libya	South Africa	Pakistan
China	North Korea	Chile	Burma
Cuba	Syria	Ethiopia	
Egypt	Taiwan		
France	Vietnam		

Source: Data from "Chemical-Arms Race Heating Up," Robin Wright, *The Los Angeles Times*, October 9, 1988, p. 1.

The renewed threat, increased proliferation, and growing acceptability of chemical weapons use in the Third World was demonstrated during the Iran-Iraq war involving, ironically, two signatories of the 1925 Geneva Protocol. Iran has accused Iraq of using chemical agents since 1984. During Iran's March offensive in 1985, the Iranians alleged that Iraq launched as many as 35 strikes by chemical weapons, causing 4600 casualties.[99] These claims were subsequently investigated by the United Nations and confirmed on April 25, 1985.[100]

---

[98] Morrison, James. "Angola Again Tied to Use of Nerve Gas," Washington Times, March 11, 1988, p. 1.

[99] Kirkham, Norman. "Iraqi Gas Leaves 'A Modern Pompeii'," Washington Times, March 23, 1988, p. 1 (hereafter, Kirkham).

[100] Ibid.

In March 1988, Iran claimed that Iraq's chemical attack on the
village of Halabja, in northeastern Iraq, killed between 3000 and 5000
people.[101] Iran, struggling to continue the Gulf War and isolated by
international demands that it must agree to a cease-fire, decided to put
Halabja on show to Western newspapers and television in protest against
the chemical weapons being used by Iraq.[102] The U.S. State Department
spokesman at that time, Charles Redman, stated: "There are indications
that Iran may also have used chemical artillery shells in this
fighting."[103]

Soon after the Iran-Iraq cease-fire, Iraq reportedly used poison gas
against its own population in the Kurdish village of Mesi on August 25,
1988, in retaliation of Kurdish support to Iran.[104] This, and the
incident at Halabja, brought chemical weapons again to world attention,
demonstrating as well that they are readily available for use throughout
the Third World.

Even when evidence of chemical warfare use is overwhelming,
successfully organizing sufficient international outrage and diplomatic
pressures against the violators can be difficult, if not impossible.
Despite United States and British intelligence reports strongly
indicating that Libya's chemical complex at Rabta possesses the
capability for producing large quantities of chemical weapons, efforts
to muster world support for condemnation of Libya failed.[105] West
Germany stated that the "United States has not provided sufficient

---

[101] Ibid.

[102] Kirkham.

[103] Ottaway, David B. "U.S. Decries Iraqi Use of Chemical
Weapons," Washington Post, March 24, 1988, p. 37.

[104] Watson, Russel and John Barry. "Letting a Genie Out of a
Bottle," Newsweek, September 19, 1988, p. 30 (hereafter, Watson and
Barry).

[105] Smith, Jeffrey R. and Edward Cody. "U.S. Bid to Condemn Libya
Chemical Arms Met Coolly," Boston Globe, January 7, 1989, p. 3.

evidence to back up its [Libyan] claims."[106] The Soviet Union has also
expressed skepticism, unconvinced by U.S. intelligence that the Libyan
plant was a chemical weapons factory.[107]

The fundamental problem in limiting or reducing the threat of
chemical and biological weapons proliferation is the extreme difficulty,
if not impossibility, of verification. Former Deputy Assistant
Secretary of Defense Frank Gaffney stated before a 1989 session of the
Senate Governmental Affairs Committee that "the Libyan [chemical] plant
illustrates the point that there is simply no certain way to distinguish
between legitimate facilities ... and those producing weapons."[108]
Echoing this fundamental problem of devising a sound, verifiable
chemical weapons treaty, William F. Burns, director of the Arms Control
and Disarmament Agency, acknowledged that it would be "years before we
have an acceptable verification package," and that the United States
still needed to carry out "additional basic research" to develop ways to
monitor a treaty.[109] Despite the continued efforts of many well-
intentioned nations, including the United States, to curb the
manufacture and use of chemical and biological weapons, their continued
proliferation and employment in future Third World conflicts must be
assumed.

Chemical warfare, especially when combined with an intermediate-
range missile capability, has the potential of placing at risk forward-
deployed United States military forces engaged in future Third World
regional conflicts. According to an unclassified 1985 study by the
Defense Intelligence Agency, a medium-range missile carrying 1200 pounds

---

[106] McCartney, Robert J. "Bonn Names 4 More Firms Linked by U.S.
to Libya," Washington Post, January 10, 1989, p. 16.

[107] Gordon, Michael R. "Chemical Weapons Parley Labors On," New
York Times, January 11, 1989, p. 8.

[108] Quoted from the Federal Information Systems Corporation
transcript, February 10, 1989.

[109] Gordon, Michael R. "Delay Seen in Technology to Verify
Chemical Ban," New York Times, February 12, 1989, p. 6.

Table 3-3

Emerging Nuclear Weapon Nations

Country	Status
Israel	Believed to possess 50-100 weapons.
India	Tested nuclear device in 1974. Has essentials for 20-50 weapons. Greatly expanded production facility.
Pakistan	Suspected having essentials for 2-4 weapons.
South Africa	Believed to posess 10-20 weapons.
Argentina	Building facilities necessary for nuclear weapons capability.
Brazil	Building facilities necessary for nuclear weapons capability.
Iraq, Iran, North Korea, Taiwan	Experimentation only.
Libya	Attempted to purchase nuclear weapons in early 1970s, 1981.

Source: Data from: *The Undeclared Bomb*, Leonard S. Spector, Cambridge, Mass.: Ballinger, 1988, p. 18.

Efforts by the superpowers to control the spread of nuclear weapon materials and technologies include the International Atomic Energy Agency, which conducts audits and on-site inspections in more than 100 member-states, and the 1968 Treaty on the Non-Proliferation of Nuclear Weapons, now ratified by more than 130 non-nuclear weapon states. Nonetheless, nuclear materials have been available either from clandestine sources or from countries who do not honor international agreements limiting their transfer. Argentina, Brazil, India, Israel, and Pakistan have not ratified the Non-Proliferation Treaty, and each possesses unsafeguarded nuclear facilities.[114]

[114] Ibid., p. 9.

of the nerve agent "VX" would produce a 50 percent casualty rate in a
target area one-third of a mile wide and 2.5 miles long.[110] As
President George Bush has stated, "The proliferation of chemical weapons
and the ballistic missiles that can carry them [is] the single greatest
emerging military danger."[111]

3.5 NUCLEAR PROLIFERATION

In addition to the declared nuclear-weapon states of the People's
Republic of China, United States, Soviet Union, Great Britain, and
France, four undeclared nuclear nations could prepare and deploy nuclear
weapons: India, South Africa, Israel, and Pakistan.[112] Since 1980, 11
Third World countries have taken steps to obtain a nuclear capability
and are at varying stages of development (see **Table 3-3**).

Of major concern to U.S. Air Force planners is that most of the
countries that have acquired or pursued undeclared weapons capabilities
have engaged in some level of military conflict in recent years or have
come dangerously close to doing so: the Iran-Iraq War, Israel's
invasion of Lebanon, Argentina and Great Britain in the
Falklands/Malvinas conflict, Libyan forces in Chad, South African
activities in Angola, and military maneuvers along the borders of
Pakistan and India.[113] In addition, unknown factors differ widely among
each of these nations, including nuclear security controls, personnel
access, weapons storage, and the varying political stability of each
government.

---

[110] Gillette, Robert. "European Firms Develop Missiles for Middle
East," Baltimore Sun, February 8, 1989, p. 1.

[111] Watson and Barry.

[112] Spector, Leonard S. The Undeclared Bomb (Cambridge, Mass.:
Ballinger, 1988) p. 3 (hereafter, Spector).

[113] Ibid., p. 6.

Non-proliferation agreements notwithstanding, international restraints have been unable to prevent Pakistan from achieving an undeclared nuclear capability, to limit increasing nuclear strength by South Africa, India, and Israel, and to stop clandestine shipments of nuclear materials to other Third World buyers.[115] West German investigators implicated two manufacturers in the illegal sale of equipment and materials intended for use in producing nuclear weapons in South Africa, Pakistan, and India between 1982 and 1988.[116] Norway has also been investigating illegal shipments of "heavy water" (which allows nuclear reactors to operate on natural uranium rather than enriched uranium, which is internationally controlled) allegedly sold by Sweden to third-party countries.[117]

According to a 1988 study by the Carnegie Endowment for International Peace, three events seriously call into question the capability to limit future proliferation of nuclear weapons:

► Pakistan crossing the nuclear weapons threshold over the last decade without major international objections, except by the United States,

► The continued reluctance of the United States and its allies to object to Israel's increasing nuclear capabilities, and

► The decision by the Soviet Union to transfer a nuclear-powered submarine to India and provide that country with two nuclear reactors at a time when [India] has declared to match Pakistan's nuclear capability.[118]

If international concerns and objections are not supported by effective diplomatic and trade pressures to discourage nuclear proliferation, it is conceivable that nuclear weaponry will be tolerated

---

[115] Ibid., p. 22.

[116] Schulman, Jesse. "West Germans Again Implicated in Illegal Nuclear Trade," The Atlanta Journal & Constitution, December 25, 1988, p. 23.

[117] "Norway Probes Shipment of Heavy Water to Sweden," Christian Science Monitor, November 16, 1988, p. 2.

[118] Spector, p. 12.

and become commonplace in the future. This trend is already becoming
evident in the case of Third World chemical weapons use and
proliferation. Despite United Nations-confirmed use of chemical weapons
by Iraq and their alleged use by Iran in direct violation of the 1925
Geneva Protocol, chemical warfare employed in the Iran-Iraq War raised
little concern internationally.

The Commission On Integrated Long-Term Strategy predicted that "in
the next century, forty or more countries in Europe, Asia, the Middle
East and elsewhere will have the technical wherewithal to build such
[nuclear] arsenals within a few years."[119] Current U.S. Air Force
planners should evaluate the ominous threat of nuclear weapons
proliferation among Third World nations and its potential impact on
future military operations in those regions.

Today, the Third World is undergoing fundamental changes across its
entire political, economic, and military spectrum which will continue
into the next decade. They require serious examination by U.S. military
strategists and force planners in projecting forces into these
increasingly lethal regions of the world. As U.S. military strategy
evolves to maintain an effective deterrence in the Third World, its
forces, capabilities, and infrastructure must also change to support
that strategy. The next chapter examines potential changes in future
U.S. Air Force capabilities and force structure in response to Third
World transformations and their implications for C^3I.

---

[119] Report of The Commission On Integrated Long-Term Strategy,
p. 10.

CHAPTER FOUR

CRITICAL ISSUES AND COMPETING OPTIONS

4.1 INTRODUCTION

A number of issues arise in evaluations of future U.S. Air Force structure and policy options at a time of changing Third World environments to include the prospect of constrained U.S. military budget resources. This chapter begins by examining one possible U.S. military strategy for future Third World conflicts utilizing precision "stand-off" weapons, the technical demands such a strategy would place on its supporting C^3I system, the stakeholders, critical issues, competing options, and their implications on C^3I policy. It then surveys fundamental C^3I issues and challenges that could be critical for policymakers, including future requirements for precise targeting, intelligence and the prevailing need for joint interoperability and coordination between the military services. While the author does not advocate any one military strategy here, this examination should prove useful to decision makers evaluating future technologies, force structures, and strategies designed to function across the entire spectrum of conflict in the Third World. The issues include

- <u>Intelligence</u>: Determining the organizational level at which to perform intelligence fusion and mission planning functions,

- <u>Communications</u>: Supporting the intelligence and command and control functions of the commander, and

- <u>Command and Control</u>: Balancing "national" and "theater" (regional) levels of C^2 in response to technological and political forces.

4.2 CHANGING ENVIRONMENT/EVOLVING STRATEGY

The current posture of "forward defense" serves as a fundamental military strategy for United States forces and associated forward operating bases located around the world. Its intent is to position forces as close to potential regions of conflict as possible, ready for

quick response and thus able to provide a credible show of force. In the coming decade, the reliability of this posture may decrease, in part because of increasing political difficulties in acquiring and retaining forward basing and because of a growing reluctance by Third World and allied nations to accept an overt United States presence in many regions of the world.

Additionally, military forces deployed "forward" in support of future Third World conflicts may encounter high-threat environments which may jeopardize their ability to carry out their assigned missions successfully. Modern arms, including sophisticated, shoulder-fired missiles, would place at extreme risk both those transport aircraft resupplying personnel and material into forward bases and high-value fighter aircraft which must operate close to the conflict because of their limited range. Intermediate-range missiles, capable of carrying conventional (non-nuclear), chemical, biological, or nuclear warheads could threaten forward-deployed personnel from launch sites hundreds of miles away (see **Figure 3-1**, p. 29 above).

Challenges to future U.S. Air Force strategy and force structure will come not only from changing Third World political and military environments, but also from tightly constrained defense budgets already being proposed for the coming decade. A report in 1988 by the Center for Strategic and International Studies recommended that, because of future limited defense resources, "the United States must fashion a long-term defence strategy which, for the first time, links the affordability issue with strategic aims."[120] Senator John McCain, a member of the Senate Armed Services Committee, showed a similar concern when, in 1988, he stated that "resource challenges," in the face of constrained defense budgets, could result in "the most significant reductions in weapons systems since the end of World War II."[121] He

---

[120] Quoted in Flight International, November 12, 1988, p. 20 (hereafter, Center for Strategic and International Studies, 1988 Report).

[121] "McCain Speculates on B-2 Deferral, Stand-Off Role for B-1," Aerospace Daily, December 7, 1988, p. 346.

went on to stress a need to link defense strategy with the budget and predicted that, "we may have to ... concentrate more of our [United States] defense resources ... for low-intensity conflict."[122]

These two compelling challenges, the rapidly changing Third World environment and limited future defense resources, have resulted in a reexamination of future U.S. Air Force strategy in the Third World. Current studies, including Discriminate Deterrence,[123] urge the development of future military strategies that would maintain a capability to demonstrate national resolve independent of Third World basing support while limiting exposure of United States forces to an increasingly lethal Third World environment. One possibility being seriously considered is a strategy employing extreme-range, high-endurance aircraft staging from United States or secure allied bases, able to launch long-range, precision-guided cruise missiles. These weapons, also referred to as "stand-off" weapons, are said to be capable of being launched hundreds of miles outside the lethal range of enemy defenses and navigating with extreme precision to their target utilizing internal sensors or, as envisioned in the future, with the assistance of global positioning navigational satellites.[124]

A stand-off strategy such as this would offer a number of unique capabilities. Long-range aircraft, capable of loitering for extended periods of time, would be independent of Third World forward basing. Jeffrey Record, a defense analyst with the Hudson Institute, favors a similar strategy. Supporting a greater emphasis on air power in the future, he sees a need to emphasize long-range air forces which are not dependent on basing rights and thus are available when needed.[125]

---

[122] Ibid.

[123] Report of The Commission On Integrated Long-Term Strategy.

[124] Fulghum, David. "Munitions Systems Division Aims for Newer and Better Missiles," Air Force Times, July 3, 1989, p. 12.

[125] Center for Strategic and International Studies, 1988 Report.

According to Vice Admiral Robert F. Dunn, USN, "It takes a ship with an air wing that is already worked up about 10 days to get from the East Coast of the U.S. to the Eastern Mediterranean, ... [and] almost a month to get from a Pacific coast port to the north Arabian Sea."[126] Long-range aircraft could respond in hours and be able rapidly to demonstrate national intent, yet reduce the present requirement for large, expensive, and vulnerable permanently stationed United States forces.

A stand-off strategy could additionally reduce the need to deploy large numbers of forces into forward bases during military conflicts, thus lessening the exposure of personnel and aircraft to the high-threat environments expected in future Third World regional conflicts. Logistical, communications, and other infrastructure necessary to support these forward-deployed forces could also be reduced.

A similar proposal was endorsed by President George Bush's National Security Advisor, Lieutenant General Brent Scowcroft, USAF (Retired). In an analysis of national security policy he prepared as part of a report on the "American Agenda" by former Presidents Ford and Carter, General Scowcroft recommended relying more on cruise missiles for military missions and reducing United States dependence on aircraft carrier operations, in order to deal with a "mismatch between the limited resources available for defense."[127]

United States military forces today possess a limited variety of operational, long-range, stand-off cruise missiles. In support of its strategic nuclear deterrence mission, the U.S. Air Force currently deploys the air-launched cruise missile (ALCM) with its strategic bomber force of B-52 and B-1 aircraft. Designed solely as a strategic nuclear weapon, it is not intended for use in Third World regional scenarios.

---

[126] Morrocco, p. 44.

[127] Gordon, Michael R. "Military Savings Suggested for Bush," New York Times, November 28, 1988, p. 1.

A variant of the ALCM is the Navy's *Tomahawk* sea-launched cruise missile (SLCM). It is capable of operating from surface ships, aircraft, or submarines and can be armed with either a nuclear or a conventional warhead. The Navy plans to deploy SLCMs able to engage targets at ranges varying from 250 miles (anti-ship version) to 1350 miles (submarine-launched, nuclear version) from 91 surface ships and 107 submarines by 1992.[128]

The value and flexibility of conventional, long-range, precision stand-off weapons for use in the extremely high-threat environments of Eastern Europe has received increased impetus from the U.S. Air Force. In 1987, the Commander-in-Chief of the Strategic Air Command (SAC), General John T. Chain, USAF, outlined a seven-year, $3.3 billion proposal to equip a portion of his command's B-52 bomber fleet with non-nuclear cruise missiles in support of NATO forces.[129] As currently planned for a European scenario, B-52 bombers would be deployed to forward operating locations on the periphery of Europe with operational control transferred to the theater commander for employment, according to Lieutenant General James P. McCarthy, USAF, then-Commander of SAC's Eighth Air Force.[130] Thus deployed, the bombers would operate against "strategic areas of responsibility," attacking targets that lie beyond the reach of shorter range fighter bombers.[131]

Next-generation, stand-off weapons are currently under development for this new SAC mission. These conventionally armed B-52 bombers, intended to assist NATO forces as part of a trend toward greater flexibility and cost reduction, could also be dual-tasked in support of a Third World stand-off strategy.

---

[128] Jaszka, Paul R. "Multimission Tomahawk Employs Dual Guidance Systems," Defense Electronics, November 1988, pp. 50-53.

[129] Jaszka, Paul R. "B-52 Stratofortress Prepares for New Mission," Defense Electronics, September 1988, p. 71.

[130] Correll, John T. "Battle Damage from the Budget Wars," Air Force Magazine, April 1988, p. 42.

[131] Ibid.

Such a strategy, employing long-range aircraft capable of rapid, highly flexible response while operating from secure United States or allied bases in the future, would have major implications among stakeholders both within the U.S. Air Force and throughout DoD. Tactical fighter squadrons, with their associated support personnel and logistical infrastructure, could be reduced from their current posture of world-wide operations. Military Airlift Command's present requirement to support large-scale deployments into forward operating bases during Third World conflicts could also be reduced or eliminated, freeing their transport aircraft fleet for other missions. The Strategic Air Command would assume increased responsibilities in operating, maintaining, and in-flight refueling the long-range aircraft required to support this proposed strategy.

However, joint operations involving both U.S. Air Force and Navy stand-off, precision-strike weapons would present other challenges to this strategy. Joint service planning and execution would be a critical element, and would be exacerbated by the widely dispersed forces such a strategy would dictate. A number of these challenges and the C^3I issues they present are examined later in this chapter.

A stand-off strategy for Third World conflicts utilizing cruise missiles possesses a number of inherent limitations. Precision-guided weapons launched from long-range aircraft would be relatively few in number; they would thus be capable of inflicting only limited damage, despite highly-accurate targeting. An advantage of this limitation, especially in support of low-intensity conflicts, is the ability to demonstrate national resolve while minimizing collateral damage and civilian casualties.

Furthermore, long-range aircraft operating from United States or allied bases would require in-flight refueling for long-distance flights. This future requirement would add to the current high demand for SAC's fleet of refueling aircraft, thus increasing the number of support aircraft needed.

This type of strategy cannot totally supplant the need for troops on the ground in military operations such as rescuing American civilians or diplomats, protecting property, or maintaining a continued U.S. presence as in certain LIC scenarios. Without conventional forces to complement a stand-off strategy, an attack by precision weapons could provoke, rather than reduce, tensions in future Third World conflicts. Yet, given the growing reluctance of Congress to commit ground troops in prolonged conflicts and the increasing difficulty in maintaining forward operating bases, future military strategies may very well have to depend upon air and naval-delivered ground forces only after stand-off weapons have failed to halt aggression by a belligerent Third World nation.

Regardless of the advantages and disadvantages inherent in such a stand-off strategy, its effectiveness would directly depend upon the capabilities of its supporting intelligence, communications, and overall command and control structure. The next three sections examine competing issues and challenges involving the critical intelligence, communications, and C^2 aspects of such a strategy.

4.3 INTELLIGENCE ISSUES

Whether utilizing a strategy or deploying conventional ground troops into a Third World conflict, U.S. forces would depend on an intelligence system capable of rapid and precise collection, filtering and analysis (fusion), and dissemination of required target information in order to provide a credible national military response in future Third World conflicts. The importance of these intelligence functions was underscored by the Regional Conflict Working Group, which stated that

> The strategic cornerstone for regional conflict
> in the Third World is intelligence -- the U.S.
> ability to collect, analyze, and disseminate
> information ... to assure discriminate responses
> by allies or our [U.S.] own forces.[132]

---

[132] Gorman, Paul F. et al., The Regional Conflict Working Group to the Commission on Integrated Long-Term Strategy, Supporting U.S. Strategy for Third World Conflict (Washington, D.C.: The Pentagon, 1988)

The increasing capabilities of next-generation cruise missiles would create extremely stringent demands for precise targeting intelligence collected from terrestrial, airborne, and space-based sensor systems in the future. Nearly-perfect targeting accuracies, based on rapidly improving new technologies, indicate that future capabilities will be measured in millimeters as compared to accuracies of many meters in today's weapons. Guidance systems currently under development utilizing millimeter wave, laser radar, and advanced synthetic aperture radar technologies will allow cruise missiles to avoid adverse weather, fly over and around terrain at extremely low altitude to avoid detection, and locate and attack targets at longer ranges with very fine precision, according to General Bernard P. Randolph, USAF, commander of the U.S. Air Force's Systems Command.[133]

As part of a stand-off strategy, the capabilities of precision-guided weapons would not be limited primarily by their range or guidance systems, for these are rapidly improving with maturing technologies. Instead, the speed and level of precision within the sensing, filtering, and analyzing functions inherent in its supporting intelligence system would be the limiting variables.

Cruise missiles are able to navigate very precisely over hundreds of miles using an autonomous guidance system. This system uses terrain contour matching (Tercom) for comparing continuously sensed elevations below the missile as it flies with elevation data stored in an on-board computer. Before a cruise missile can be programmed with the intended route of flight and desired target, "raw" data collected by remote sensor systems must first be filtered and analyzed at an intelligence "fusion center." To selectively attack the power plant of a factory or incapacitate a country's power grid, for example, the fusion center must determine the precise location of the target and its critical nodes. Currently, many weeks of intelligence gathering and planning are needed

---

p. 56 (hereafter, Gorman et al.).

[133] Ulsamer, Edgar. "Wind of Change in Tactical Warfare," Air Force Magazine, April 1988, p. 49.

to perform this task, according to then-Senator and Senate Armed Services Committee member Dan Quayle.[134] This initial process requires compiling precise maps and photographs of the route of flight and target area. The resulting information is then converted, during the "mission planning" process, into digital computer commands before being transferred to the missile's guidance system.

A strategy that can limit destruction by "discriminate" targeting using precision-guided weapons implies "intelligence (meaning sensors and fusion) and precision (meaning C^3)," according to Rear Admiral W. J. Holland, Jr., USN.[135] The precision and timeliness of the sensing, fusion, and mission planning functions would be critical factors in determining the effectiveness of a future stand-off strategy.

According to Lieutenant General Lincoln Faurer, USAF, former director of the National Security Agency, "The real issue is *where* the fusion should take place, and that, in my opinion, is the far more difficult question."[136] There is a "clear trade-off," he points out, "between letting all the intelligence be assembled at one place, well out of [the] theater [of operations] where processing assets are optimally employed, and letting intelligence be processed [in theater]." The location of the fusion center would have major implications for the timeliness, quality, survivability, and ultimate control of the processed information.

Currently, the majority of collected intelligence is processed in Washington, D.C., according to Rae M. Huffstutler, deputy director of

---

[134] Quayle, Dan. "Upgrading Our Cruise Missiles: Imperative for the 1990s," Armed Forces Journal International, August 1987, p. 77.

[135] Holland, W. J., Jr., Rear Admiral, U.S. Navy (Retired). "Discriminate Deterrence: Harbinger of a New Strategy," Signal, June 1988, p. 194 (hereafter, Holland).

[136] Faurer, Lincoln, Lieutenant General, USAF. "The Role of Intelligence within C^3I," in Seminar on Command, Control, Communications, and Intelligence: Guest Presentations - Spring 1985 (Cambridge, Mass.: Program on Information Resources Policy, Harvard Univ., 1985) pp. 20-21 (hereafter, Faurer).

Administration for the Central Intelligence Agency. He foresees that in the future, with larger amounts of intelligence collected and greater user requirements, "The choke point is going to come with the analytical effort -- the readout, getting information out of [the system] -- and it's simply beyond Washington [D.C. intelligence agencies] to cope with all that."[137] As a solution to this problem, Huffstutler believes that in the future

> this kind of collection, processing, and
> reporting ... instead of stopping in Washington
> [D.C.] with the finished product going out, [it]
> has got to go directly out to the field, because
> of the timeliness issue.... [W]hen you have
> forces that can move within hours, you've got to
> have information about those forces turned
> around and moved directly to the field. It's
> that time pressure that's going to force the new
> architecture in the intelligence community ...
> [and] be much more useful ... to people dealing
> with low intensity combat ... conventional
> combat, and so on.[138]

While examining future tactical intelligence requirements in support of United States forces in Third World conflicts, the Regional Conflict Working Group also stated the need for intra-theater processing of regional intelligence. They concluded that the United States must satisfy a number of intelligence requirements in support of future Third World conflicts, among these: "[The] ability in-theater to perform all-source management, including tasking of collectors, first-order interpretation of results, and timely cross-cuing of other collectors."[139]

---

[137] Huffstutler, Rae M. "Intelligence Sources and Their Applications," in <u>Seminar on Command, Control, Communications, and Intelligence: Guest Presentations - Spring 1988</u> (Cambridge, Mass.: Program on Information Resources Policy, Harvard Univ., 1988) p. 14.

[138] Ibid.

[139] Gorman et al., p. 60.

Despite his support for intelligence processing at the "theater" level, Huffstutler acknowledges that a number of yet-unresolved issues remain. These include

- Who tasks the collector?

- Which user has priority?

- Who is in charge of the database?

- Who is responsible for quality control?

- What access rights should be placed on databases?

- How are the levels of security compartmentation controlled?[140]

The alternative to intra-theater intelligence processing is locating the fusion center outside the theater of operations at the national level in support of multiple theater commanders. This alternative would solve some previously stated concerns, offer a number of distinct advantages, and also raise some competing issues. Centralization of the filtering and analysis functions (fusion) could lead to savings in cost, equipment, and personnel. Additionally, those personnel who possess the required analytical and unique intelligence expertise would be concentrated at a single location and their capabilities would thus be optimized. According to Faurer:

> The volume of data we are dealing with now and will surely deal with over the next decade ... [is] one of the reasons I come down slightly on the side of the fence that argues for fusion taking place predominantly back from the forward area, outside the battlefield, because I want to make optimum use of the talented people who are available [for processing and analyzing].[141]

At the same time, this national level of intelligence fusion creates a number of potential disadvantages. A system supporting multiple theater commanders could result in problems such as

---

[140] Huffstutler, pp. 15-16.

[141] Faurer, p. 23.

- More generalized, less theater-specific intelligence,

- Loss of direct control by the theater commander over his intelligence support,

- A system less responsive to changes in taskings, and

- Dependence upon connectivity with the national-level fusion center.

Additional questions include the following:

- How many conflicts can be supported simultaneously by a national-level intelligence fusion center?

- Who decides which conflict requires primary attention and which receives less priority?

- Would theater commanders experience delays in intelligence support from a national-level fusion center during single or multiple conflicts?

- To what degree would Third World conflicts be supported by nationally controlled intelligence sensors and who would make this decision?

The mission planning process, that second phase which utilizes the "processed" intelligence to build the digital commands needed by a cruise missile to navigate and identify its target, is challenged with similar tradeoffs. Should it be collocated with the fusion center outside the theater of operations, or reside in-theater and thus be more accessible and responsive to the theater commander? As in the fusion process, determining the appropriate level at which the mission planning should occur requires striking a balance between national and theater requirements and capabilities.

The level at which the intelligence fusion and mission planning functions are performed has major implications regarding the speed, accuracy, and overall control of the intelligence on which a stand-off strategy would ultimately depend. Regardless at what level the intelligence fusion and mission planning functions are performed, this strategy is intrinsically dependent on the connectivity between these processes and the forces they support. The next section focuses on a

number of fundamental communications issues involving this critical connectivity requirement.

4.4 COMMUNICATIONS ISSUES

A stand-off strategy would require rapid, secure communications to ensure connectivity between theater and/or strategic sensors and their supporting fusion center, between the fusion center and theater commander or mission planning center, and between the theater commander and his forces. According to Rear Admiral Holland

> [Such a strategy] ... does not require speeds equal to those present in strategic warning and C^2 measures focusing on Soviet intercontinental ballistic missile (ICBM) attack. The sense for the C^3I ... here is responsiveness, not immediacy.[142]

Processing "raw" intelligence data in-theater would lessen the communications requirements in contrast to processing at the national level and transmitting "finished" intelligence back to the theater commander. The disadvantage, as explained by Faurer, is that while data transfer is reduced by in-theater processing, it creates added requirements for locating processing personnel and equipment close to the conflict:

> The communications demand of moving everything collected back to a central processing and analysis capability, and then sending data back in tailored form to the multiple users, must be measured.... The various collection capabilities could channel their immediate take into the theater to be processed, analyzed, and turned around there for the decision maker. If that's the method, there's obviously going to be a big tail of support people, computers, and capability forward, but communications would only need to cover a relatively short distance.[143]

---

[142] Holland.

[143] Faurer, p. 22.

The location of the fusion and mission planning processes directly affects the required communications structure and support requirements. As Faurer points out, the problem with fusion "is accentuated by automation in the fusion process because it places a very disciplined demand on communications to move volumes of data."[144] He goes on to state: "Imagery does not have a timeliness problem, but it has a volume problem. What is moved makes a great deal of difference in one's communications load."[145]

This point is also made by Huffstutler: Locating the fusion process out-of-theater results in communications requirements which cannot be satisfied because of the enormous amounts of data that would need to be transmitted. He states that "you do need ... the ability to pass a lot of data to the field, and you don't have the bandwidth today [1988] to pass it."[146]

According to Captain A. R. Wood, Royal Navy, then-Chief Naval Signal Officer in the British Ministry of Defence, "[The Falklands/ Malvinas conflict] ... highlighted the importance of secure, high capacity and high availability communication, because without them, the required degree of control could not have been exercised."[147] This lesson also applies to a stand-off strategy incorporating long-range aircraft with precision-guided cruise missiles and its dependence on a supporting communications structure.

Satellite communications, as the British found during the Falklands conflict, provided many unique capabilities which have resulted in widespread demand and integration into military forces worldwide. United States forces are no exception. General Jack I. Gregory, USAF,

---

[144] Ibid., p. 21.

[145] Ibid., p. 20.

[146] Huffstutler, p. 15.

[147] Wood, A. R., Captain, Royal Navy. "War in the South Atlantic: The Naval Communications Challenge," Signal, December 1982, p. 84 (hereafter, Wood).

while Commander-in-Chief (CINC) Pacific Air Forces (PACAF), stated in
1988 that PACAF is relying increasingly on satellite communications
because of the speed of access and superior quality in applications such
as secure voice.[148] The U.S. Navy is also depending more on satellite
communications. According to Dr. E. Ann Berman, Deputy Assistant
Secretary of the Navy for command, control, communications, and
intelligence systems (C^3IS), "The U.S. Navy has recognized that it is
becoming more reliant on space to support the maritime strategy."[149] In
time of conflict, these communications systems will be in high demand.
According to Wood:

> The single most important lesson learned [in the
> Falklands conflict] was the absolute necessity
> for a fleetwide fit of satellite communication
> terminals, and the requirement for a nationally
> owned space segment in order to reduce the
> demands for capacity from our allies.[150]

While emphasizing the many advantages satellite communications
presents to the military user, Gregory also warns that a dangerous trend
is becoming more prevalent: the over-reliance on modern communications
without planning for viable alternatives.[151] Satellite communications
are able to offer speed, accessibility, and versatility, yet during
military conflicts, their limited capabilities may be overloaded with
user demand far exceeding supply. Additionally, they are subject to
jamming and, in an extreme case, destruction.

Despite the growing dependence and invaluable capabilities which
satellite communications provided to British forces in the Falklands,
their experience also confirmed the need for flexibility. In the words

---

[148] Gregory, Jack I., General, USAF. "Command and Control of Air
Power in the Pacific," Signal, February 1988, p. 56 (hereafter,
Gregory).

[149] Berman, Dr. E. Ann. "Balancing Force and Force Control,"
Signal, September 1987, p. 101.

[150] Wood, p. 86.

[151] Gregory, p. 59.

of Wood, "[T]he need for ... back-up will always remain, because
flexibility in communications, as in all other warfare areas, is
essential."[152]

Communications tradeoffs and challenges envisioned in a stand-off or
other future strategy include

- Whether to emphasize in-theater fusion and mission planning
  with reduced dependence on theater/national communications
  links versus national-level processing with connectivity to the
  theater commander provided via high-volume datalinks,

- How to determine user priority during conflicts given limited
  communications channels,

- How to provide alternate communications capabilities compatible
  with all U.S. armed forces,

- How to accommodate lower-priority communications users during
  conflicts, and

- How to balance individual service requirements while achieving
  interoperability in communications systems.

A fundamental problem related to a future stand-off strategy involves
how to integrate the intelligence and communications systems into the
overall command and control of forces which would make up such a
strategy. These relationships are now explored.

4.5 COMMAND AND CONTROL ISSUES

The concept of "command and control," discussed earlier in chapter 2
and additionally in this report's appendix, includes the process a
commander employs in planning, directing, coordinating, and controlling
his assigned forces. It can also be viewed as a *capability*, as stated
by Lieutenant General Clarence E. McKnight, Jr., USA, former director
for Command, Control, and Communications Systems for the Joint Chiefs of
Staff. This capability belongs to the "one who executes" the forces

---

[152] Wood, p. 86.

assigned to him as part of a particular strategy.[153]   In a stand-off
strategy employing long-range aircraft and missiles capable of staging
from anywhere in the world, will the level of intelligence fusion,
combined with modern communications capabilities, be a critical factor
in the theater commander's ability to "execute" in such a strategy?

United States forces today are deployed throughout geographical
regions of the world and are under the command and control of a regional
or theater commander, who is responsible for the forces assigned to that
area of interest.   These Commanders-in-Chief (CINC) of geographical
regions have responsibility for the Atlantic, Pacific, Europe, Central
(Middle East and East Africa), and South (Central and South America).
In light of the evolving Third World threat as outlined in chapter 3,
this present command structure may require reevaluation as overseas
bases are reduced and the costs of maintaining associated personnel
staffs and supporting infrastructure incur greater Congressional
scrutiny.   A future theater CINC may find himself "deployed" from a
continental U.S. base to the region of conflict onboard a naval or
airborne command platform, totally independent of a forward operating
base.

A fundamental issue in implementing a stand-off strategy is this
balance of command and control between the national and theater levels
of authority, and the extent to which technology determines the one who
is executing the forces.   The stakeholders include the theater commander
who, in an effort to maintain direct control of his forces, desires a
C^3I structure indigenous to his theater of operations and responsive to
his specific needs in a rapidly changing battlefield environment.   The
price of this capability includes additional forward-deployed manpower
and infrastructure, yet it allows the CINC to function quasi-
independently of a centralized fusion center.   At the opposite end of

---

[153] McKnight, C. E., Jr., Lieutenant General, U.S. Army.   "C^3I
Systems at the Joint Level," in Seminar on Command, Control,
Communications, and Intelligence: Guest Presentations - Spring 1986
(Cambridge, Mass.: Program on Information Resources Policy, Harvard
Univ., 1986) p. 23.

the issue is the desire by the National Command Authority (NCA) to
maintain complete control of a conflict at the national level by
utilizing a centralized fusion center. In this second scenario, the
theater commander would be provided nationally processed intelligence,
requiring connectivity at all times with the supporting national fusion
center. Other options include allocating responsibilities of the fusion
process between both national and theater levels, as well as performing
the fusion process outside of the theater of conflict but not at the
national level.

Balancing these issues involves not only technological factors, but
also political ones. A number of questions are critical to an
examination of the potential impact of intelligence fusion and
communications capabilities on C^2 for a stand-off strategy:

- To what extent have communications technologies affected the
  "command" of forces today?

- Would the level of intelligence fusion necessarily determine
  the C^2 of forces encompassing future strategies?

- What are the advantages and disadvantages of each?

As stated by Charles W. Snodgrass, former assistant secretary of the
Air Force for Financial Management, "[L]ooking at ... C^3I ... the most
important issues are in fact not in dollars -- there are more than
adequate dollars available to solve the problem. The real issues we've
been talking about are organizational."[154]

Some observers have perceived a trend today toward a more national
level of control in regional conflicts, primarily because of advances in
communications technologies. As Lieutenant General John T. Myers, USA,
director, Defense Communications Agency, stated:

---

[154] Snodgrass, Charles W. "Funding C^3I," in Seminar on Command,
Control, Communications, and Intelligence: Guest Presentations - Spring
1981 (Cambridge, Mass.: Program on Information Resources Policy, Harvard
Univ., 1981) p. 144.

> If you want to talk in particular [about] the
> low-intensity conflict environment [or] the high
> political sensitivity environment [of today],
> then the days of sailing off into the sunset and
> operating independently of higher authority for
> lengthy periods of time and doing what you
> thought best are gone.... The world is too small
> ... anybody is about a nanosecond apart these
> days.[155]

To reinforce his point of view, Myers goes on to state:

> An excellent example of high-order involvement
> at a time when de-escalating a conflict was
> preeminently more important than allowing it to
> flow to its logical military conclusion ... is
> the Persian Gulf/Indian Ocean conflict.[156]

During the Persian Gulf conflict of 1988-89, United States naval
aircraft were involved in attacking an Iranian frigate. Myers stated:

> In a very politically sensitive, very high-level
> orchestrated environment ... one could presume
> there was a relatively high-level instant
> decision which says that it's in the United
> States' best interest not to put that ship on
> the bottom of the Indian Ocean. Therefore,
> Admiral ... tell that airplane not to drop the
> next bomb. That required an instant
> communication linkage from the bridge to the
> aircraft and back to Washington [D.C.]. From a
> communicator's perspective ... that is an
> absolutely perfect application of the technology
> to allow national strategy to be executed
> consistent with national policy, and to
> instantly de-escalate.[157]

This perception of a move toward a more centralized control
structure, made possible in part by improved communications
technologies, was also emphasized by Snodgrass:

---

[155] Myers, John T., Lieutenant General, U.S. Army, remarks prepared
for presentation to the Seminar on Command, Control, Communications, and
Intelligence at Harvard University, Cambridge, Mass., March 16, 1989.

[156] Ibid.

[157] Ibid.

> I believe that over the long haul the
> bureaucratic imperatives of that [the ability
> for the Secretary of Defense to talk to the
> local commander in real time] is so great, and
> the technology is making it so easy, that
> [keeping senior decision makers out of the loop]
> will be the exception rather that the rule.[158]

Real-time communications capabilities today and in the future have the potential of moving the NCA to the lowest level of control where he has the ability to direct the "soldier-in-the-field," if desired, enabling the NCA to

- Escalate/de-escalate immediately, thus preventing regional conflicts from becoming major confrontations,

- Evaluate not only the situation in a particular theater of operations, but also intelligence from other theater or national sources and classification levels, and

- Maintain total control throughout all levels of conflict.

A greater reliance on strategic sensors and centralized fusion centers external to the theater of operations has the potential of creating a more centralized C^2 structure, facilitated by communications capabilities to the Pentagon or White House during conflicts, thus directly affecting the theater commander's command and control of his forces. If the intelligence fusion process is centralized at a national level, other individuals and organizations outside the direct command of the theater CINC would be controlling the allocation of sensors and fusion of the collected intelligence data, reducing his control and orienting it toward a more national level. As described by Dr. Anthony Oettinger, chairman of Harvard University's Program on Information Resources Policy:

---

[158] Snodgrass, p. 143.

> If too much fusion occurs, then there are user
> complaints about others putting together or
> suppressing information without the authority to
> do so. This is not a technical matter; this is
> a philosophical matter. It's not just trade-
> offs between how much communications versus how
> much computing. In a deeper sense, this is a
> matter of how much delegation versus how much
> overload; how much trust versus how much
> understanding.[159]

McKnight sees this "national" versus "theater" issue as originating during the Vietnam War. He states:

> I think we did some very bad things by being
> able to pipe all that information back during
> the Vietnam crisis.... [I]t set the pattern for
> that micromanagement that provides a hell of a
> challenge today. I just believe that a crisis
> can be managed much better closer to the
> source.[160]

Centralizing the intelligence fusion at a national-level location, in support of multiple theaters of operation, can result in a number of potential problems. These include

- Overloading a centralized system,

- A dependence upon the connectivity between the national-level fusion center and theater CINC,

- Centralized fusion processing at the national level, in an overload situation, possibly jeopardizing a CINC's C^2 of his forces,

- A tendency of the NCA to overlook other factors, options, or solutions affecting a conflict, which may be available at the CINC's level, and

- Micromanagement of all military conflicts, large and small, at the national level, weakening the authority of the theater CINC.

---

[159] Faurer, p. 22.

[160] McKnight, p. 29.

The fundamental issue here is how to balance the national and theater levels of C^2, taking into account the influence of technology as well as that of political forces. In processing collected intelligence data through a fusion center at the national level, the theater CINC would depend upon people, technologies, and organizations not under his immediate control. Intra-theater intelligence fusion, on the other hand, would allow the theater CINC more direct control, thus better enabling him to tailor the filtering and analysis functions in a rapidly fluctuating environment.

It becomes a political question: "How much will the NCA delegate to the theater commander?" The advantage of technology is that it allows the NCA to shift the balance in either direction, depending upon to what degree the NCA elects to delegate.

Evolving Third World challenges, coupled with tightly constrained defense budgets, are resulting in a reexamination of current military strategies and force structures. As new strategies are debated, the ramifications of their supporting intelligence and communications systems and how they affect the overall C^2 of forces should be an integral part of that debate.

CHAPTER FIVE

POLICY PERSPECTIVES

The Third World, once regarded as militarily insignificant and of
nominal economic importance, will become crucial to the stability of
Western and Far Eastern industrial powers in the coming decade. This
recognition of our growing economic dependence on and the expanding
geostrategic importance of the Third World has fostered a reexamination
of United States military strategy toward these increasingly pivotal
nations.

Exacerbating the problem of a current Third World environment already
afflicted by continued political unrest and regional disputes is an
accelerating proliferation of sophisticated arms. These modern weapons
are rapidly narrowing the advantage currently held by military forces of
the West, including the United States. Admiral William J. Crowe, Jr.,
USN, former chairman of the Joint Chiefs of Staff (JCS), summarized the
stark reality seen today throughout this divergent group of nations when
he stated:

> The Third World environment is as messy as ever.
> Most of the trouble-makers have more arms than
> they need for self-defense. Now, we see
> arsenals of tanks, aircraft and mines joined by
> ballistic missiles, chemical weapons and nuclear
> technologies. There is no quick or easy way to
> stem this tide.[161]

In addition to this ominous growth in military capability throughout the
Third World, continued United States access to overseas basing, once a
stable pillar of its "forward defense" strategy, is coming under
increased scrutiny by numerous foreign governments.

These fundamental transformations ongoing throughout many Third World
nations today, combined with reduced DoD budget resources already
projected into the next decade, are forcing a reevaluation of current

---

[161] Crowe, William J., Jr., Admiral, U.S. Navy. "Don't Cut a
Winner," New York Times, April 10, 1989, p. A15.

military strategy and force structure. Secretary of Defense Richard B. Cheney predicted that "budget pressures soon will force the U.S. to shrink its military forces world-wide."[162] A reassessment of future United States defense policy is also foreseen by General Robert T. Herres, USAF, vice chairman of the JCS, who has indicated that "declining defense budgets will force a review and reduction of U.S. military commitments around the world."[163]

In analyzing future C^3I challenges in the coming decade, the author examined a proposed stand-off strategy utilizing extreme-range, high-endurance aircraft and precision-guided cruise missiles. A number of fundamental C^3I issues were outlined which are equally germane to other potential future strategies requiring rapid and precise intelligence fusion supported by advanced communications systems and C^2 structures. These issues, which can be expanded to include all military services, included

- Ensuring that future U.S. Air Force missions carried out in the Third World are supported with versatile and flexible C^3I, capable of easily adapting to rapidly changing warfare environments across the entire spectrum of conflict,

- Balancing the requirements of both national (centralized) and theater (regional) levels of C^3I,

- Ensuring that connectivity exists throughout future C^3I systems by utilizing redundant communications capabilities, and avoiding dependence on any one network, and

- Coordinating efforts between "nationally" controlled collection and information systems and theater requirements.

Senior policymakers and U.S. Air Force leaders are faced with these critical issues, which will affect future missions in the Third World and challenge its C^3I systems and organizations. Fundamental policy questions include the following:

_____

[162] Pasztor, Andy. "Defense Secretary-Designate Cheney Says World-Wide Forces May Shrink," Wall Street Journal, March 15, 1989, p. B-2.

[163] Goodrich, Lawrence J. "General Urges Cautious View of Moscow Military Cuts, Pentagon Probe," Christian Science Monitor, May 3, 1989, p. 7.

- At what point should C^3I issues be considered in the strategy-formulation process? In other words, must strategy and force structure be developed first with the supporting C^3I issues, architectures, and limitations examined at a later stage, or should C^3I play a more integral part "up front" in strategy evolution?

- Assuming that deterring aggression and protecting American and allied interests remain the ultimate aims of United States defense policy, can a strategy utilizing stand-off weapons and scaled-down ground and naval forces with effective C^3I diminish or eliminate the requirement for large, forward-deployed forces in hostile regions of the world while providing regional commanders an effective force?

- What combinations of advanced stand-off weapons, sensors, communications, and intelligence fusion technologies would be best suited to support such a strategy?

- How would these systems and C^3I architectures affect the current concept of regional C^2 of forces by a theater commander?

- Will future C^3I technologies and capabilities result in direct national control of military forces world-wide, thus shifting the location of the regional authority?

- How might C^2 procedures, systems, and organizations used by today's theater commander be affected in the coming decade given potential technical advances in communications, sensors, and fusion capabilities?

• Can C^3I policies in support of future military strategies and force structures be structured to provide the necessary flexibility to deal with a variety of "national" and "theater" contingencies brought about by changing political situations, weapon systems, and world order?

If the U.S. is to maintain its position of leadership in the coming decade, it will be necessary to expand the issues and policy questions in this paper to include all U.S. military services to achieve a coordinated national military strategy.

APPENDIX

COMMAND, CONTROL, COMMUNICATIONS AND INTELLIGENCE (C^{3}I)

A range of interpretations has been accorded to command, control, communications, and intelligence (C^{3}I) and to its role in implementing future strategy. As will become evident, the term "C^{3}I" can mean different things to different people, organizations, and military services.[164] The issues explored in this study involve these differing perceptions.

A clear consensus on the meaning of C^{3}I throughout government and industry is difficult to determine, in large part because of its common interchange with similar-sounding terms such as the following: command and control (C$^{2)}$; command, control, and communications (C^3); command, control, communications, and intelligence systems (C^{3}IS); and command, control, communications, computers, and intelligence (C^{4}I).

Another source of confusion is the combination of distinct, yet related, functions in these terms. Depending upon one's frame of reference, each phrase can have a different meaning, or they can all be treated generically as equivalent and thus used interchangeably. This problem of "perspective" was illustrated by Lieutenant General Lee M. Paschall, USAF, (Retired), formerly director of the Defense Communications Agency:

---

[164] For a deeper study of C^2, see Snyder, Frank M. _Command and Control: Readings and Commentary_ (Cambridge, Mass.: Program on Information Resources Policy, Harvard Univ., 1989).

> [To] a *technocrat* ... you can talk to him in
> terms of a "C³ system," an aggregate of
> technical sensors, communications, command
> centers, people, procedures.... [If] you're
> talking to a *manager*, ... then you'd best talk
> about C³I, because you're talking about a
> program.... If you're talking to an *operator* ...
> then you're talking about a process, a command
> and control process, which is facilitated by the
> system, all of which is financed by a C³I
> program.[165]

General Richard G. Stilwell, USA, (Retired), has emphasized some
aspects of C² that are not normally thought of, namely the
organizational structure and the people and procedures required to make
that organization work:

> Command and control involves a good many things
> that you don't normally think about: an
> organization for decision-making; a structure
> that you hold inviolate for the transmission of
> instructions downward -- although you can skip
> echelons on the way up for information purposes;
> and people who understand the mission, who are
> drilled in the doctrine and the procedures that
> constitute teamwork. In the last analysis,
> these people are especially important to the
> exercise of command and control.[166]

Each C² system and organization can be envisioned as part of a larger
system, interconnected and, to some extent, dependent upon the others.
As General Robert T. Herres, USAF, vice chairman of the JCS, has stated,
"There is no such thing as a single command and control system. There
are systems of systems, and there are parts of systems and components of

---

[165] Paschall, Lee M., Lieutenant General, USAF, (Retired). "C³I and
the National Military Command System," in Seminar on Command, Control,
Communications, and Intelligence: Guest Presentations - Spring 1980
(Cambridge, Mass.: Program on Information Resources Policy, Harvard
Univ., 1980) p. 68.

[166] Stilwell, Richard G., General, U.S. Army (Retired). "Structure
and Mechanisms for Command and Control," in Seminar on Command, Control,
Communications, and Intelligence: Guest Presentations - Spring 1985
(Cambridge, Mass.: Program on Information Resources Policy, Harvard
Univ., 1981) p. 65.

systems, but I don't know of any truly single system."[167] This point of interconnection was reiterated by Lieutenant General John H. Cushman, USA, (Retired):

> [C]ommand and control -- [the commander's] C^3I
> -- is actually a web of systems. It extends
> from the top all the way down to the bottom of
> the command.... [C]ommand and control systems
> are a mix of men and man-made systems.[168]

As can be seen, command and control can be interpreted from many aspects, giving emphasis to people, hardware, concepts, doctrines, and organizations in varying concentrations. The Joint Chiefs of Staff define "command and control" as

> the exercise of authority and direction by a
> properly designated commander over assigned
> forces in the accomplishment of the mission.
> Command and control functions are performed
> through an arrangement of personnel, equipment,
> communications, facilities, and procedures which
> are employed by a commander in planning,
> directing, coordinating and controlling forces
> and operations in the accomplishment of the
> mission.[169]

The Joint Chiefs of Staff's definition of C^2 incorporates not only the *command* function (the first part) and *control* function (the last part) but also includes the *systems* (the middle part), which allow the commander to execute his command and control responsibilities.

---

[167] Herres, Robert T., General, USAF. "A CINC's View of Defense Organization," in Seminar on Command, Control, Communications, and Intelligence: Guest Presentations - Spring 1985 (Cambridge, Mass.: Program on Information Resources Policy, Harvard Univ., 1985) p. 138.

[168] Cushman, John H., Lieutenant General, USA, (Retired). "C^3I and the Commander: Responsibility and Accountability," in Seminar on Command, Control, Communications, and Intelligence: Guest Presentations - Spring 1981 (Cambridge, Mass.: Program on Information Resources Policy, Harvard Univ., 1981) p. 97.

[169] The Joint Chiefs of Staff, JCS Publication 0-1, p. 77.

GLOSSARY

ALCM	air-launched cruise missile
ATBM	anti-tactical ballistic missile
C^2	command and control
C^3	command, control, and communications
C^3I	command, control, communications, and intelligence
C^3IS	command, control, communications, and intelligence systems
C^4I	command, control, communications, computers, and intelligence
CIA	Central Intelligence Agency
CINC	Commander-in-Chief
DoD	Department of Defense
FY	fiscal year
ICBM	intercontinental ballistic missile
IRA	Irish Republican Army
IRBM	intermediate range ballistic missile
JCS	Joint Chiefs of Staff
LIC	low-intensity conflict
NATO	North Atlantic Treaty Organization
NCA	National Command Authority
PACAF	Pacific Air Forces
SAC	Strategic Air Command
SLCM	sea-launched cruise missile
Tercom	terrain contour matching
USA	United States Army
USAF	United States Air Force
USN	United States Navy