REPORT
ON THE
BOTTOM-UP REVIEW

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Secretary of Defense

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MESSAGE FROM THE SECRETARY OF DEFENSE

In March 1993, I initiated a comprehensive review of the nation's defense strategy, force structure, modernization, infrastructure, and foundations. I felt that a department-wide review needed to be conducted "from the bottom up" because of the dramatic changes that have occurred in the world as a result of the end of the Cold War and the dissolution of the Soviet Union. These changes in the international security environment have fundamentally altered America's security needs. Thus, the underlying premise of the Bottom-Up Review was that we needed to reassess all of our defense concepts, plans, and programs from the ground up.

This final report on the Bottom-Up Review provides the results of that unprecedented and collaborative effort. It represents the product of hundreds of individuals' labor and dedication. It describes the extensive analysis that went into the review and the recommendations and decisions that emerged.

First and foremost, the Bottom-Up Review provides the direction for shifting America's focus away from a strategy designed to meet a global Soviet threat to one oriented toward the new dangers of the post-Cold War era. Chief among the new dangers is that of aggression by regional powers.

One of the central factors in our analysis was the judgment that the United States must field forces capable, in concert with its allies, of fighting and winning two major regional conflicts that occur nearly simultaneously. This capability is important in part because we do not want a potential aggressor in one region to be tempted to take advantage if we are already engaged in halting aggression in another. Further, sizing U.S. forces to fight and win two major regional conflicts provides a hedge against the possibility that a future adversary might one day confront us with a larger-than-expected threat.

Our analysis showed that we can maintain a capability to fight and win two major regional conflicts and still make prudent reductions in our overall force structure — so long as we implement a series of critical force enhancements to improve our strategic mobility and strengthen our early-arriving antiarmor capability, and take other steps to ensure our ability to halt regional aggression quickly.

Second, the review's results demonstrate to our allies, friends, and potential foes alike that the United States will remain a world power in this new era. We are not going to withdraw from our involvement around the world. While we no longer need to prepare for global war, the new dangers to our interests are global. Our review spelled out what military forces and capabilities will be needed to meet the new dangers.

Finally, the review lays the foundation for what is needed to fulfill President Clinton's pledge to keep America's military the best-trained, best-equipped, best-prepared fighting force in the world.

Providing that foundation means making readiness our number one defense priority. I have directed that this emphasis on readiness be integrated into the entire defense planning, programming, and budgeting process. We will develop new measures and standards of readiness that fit the new and less predictable requirements of the post-Cold War era.

Fulfilling the President's pledge also means proceeding with a prudent program of selectively modernizing key weapon systems. To keep our technological superiority in a period of constrained resources, we must simplify and improve the acquisition process as we simultaneously exploit the tremendous advances occurring in American industry to maintain the quality and effectiveness of our military systems.

One way we will take advantage of technological advances while reducing research, development, and procurement costs is by launching a Joint Advanced Strike Technology (JAST) program. The JAST program will focus on developing common components — such as engines, avionics, materials, and munitions — that could be used with any future combat aircraft the nation decides to build. Faster incorporation of technological advances into weapons can provide significant advantages for U.S. forces against potential adversaries.

And we must keep faith with the men and women in America's armed forces who have made service to their country their life's work. People are at the heart of our armed forces, and we must not break our bond with them. We must continue to provide the full range and quality of support, training, and education that have made ours the most highly professional, trained, and motivated force in the world. We must also treat fairly those who are leaving the military, as well as the people and communities who have long supported our armed forces.

I am very proud of the work done by the men and women in the Department of Defense, both military and civilian, during the Bottom-Up Review. We all realize that there is still much more to be done. As you read this report, that effort has already begun.

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SECTION I

NATIONAL SECURITY IN THE POST-COLD WAR ERA

Introduction

The Cold War is behind us. The Soviet Union is no longer. The threat that drove our defense decision-making for four and a half decades — that determined our strategy and tactics, our doctrine, the size and shape of our forces, the design of our weapons, and the size of our defense budgets — is gone.

Now that the Cold War is over, the questions we face in the Department of Defense are: How do we structure the armed forces of the United States for the future? How much defense is enough in the post-Cold War era?

Several important events over the past four years underscore the revolutionary nature of recent changes in the international security environment and shed light on this new era and on America's future defense and security requirements:

- In 1989, the fall of the Berlin Wall and the collapse of communism throughout Eastern Europe precipitated a strategic shift away from containment of the Soviet empire.

- In 1990, Iraq's brutal invasion of Kuwait signaled a new class of regional dangers facing America — dangers spurred not by a global, empire-building ideological power, but by rogue leaders set on regional domination through military aggression while simultaneously pursuing nuclear, biological, and chemical weapons capabilities. The world's response to Saddam's invasion also demonstrated the potential in this new era for broad-based, collective military action to thwart such tyrants.

- In 1991, the failed Soviet coup demonstrated the Russian people's desire for democratic change and hastened the collapse of the Soviet Union as a national entity and military foe.

In the aftermath of such epochal events, it has become clear that the framework that guided our security policy during the Cold War is inadequate for the future. We must determine the characteristics of this new era, develop a new strategy, and restructure our armed forces and defense programs accordingly. We cannot, as we did for the past several decades, premise this year's forces, programs, and budgets on incremental shifts from last year's efforts. We must rebuild our defense strategy, forces, and defense programs and budgets from the bottom up.

The purpose of the Bottom-Up Review was to define the strategy, force structure, modernization programs, industrial base, and infrastructure needed to meet new dangers and seize new opportunities.

An Era of New Dangers

Most striking in the transition from the Cold War is the shift in the nature of the dangers to our interests, as illustrated in Figure 1.

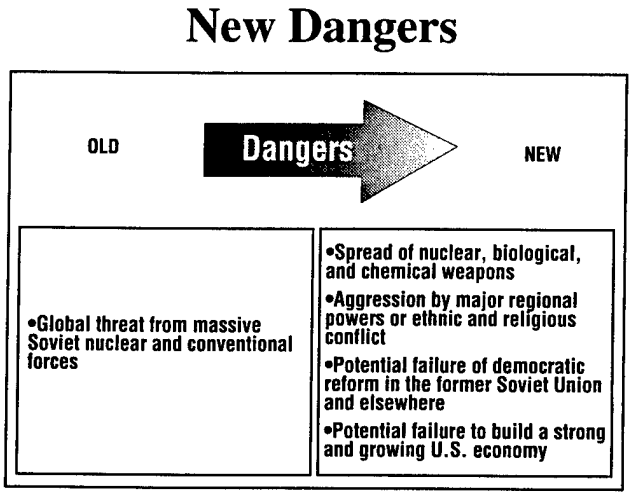


Figure 1

The new dangers fall into four broad categories:

• ***Dangers posed by nuclear weapons and other weapons of mass destruction,*** including dangers associated with the proliferation of nuclear, biological, and chemical weapons as well as those associated with the large stocks of these weapons that remain in the former Soviet Union.

• ***Regional dangers,*** posed primarily by the threat of large-scale aggression by major regional powers with interests antithetical to our own, but also by the potential for smaller, often internal, conflicts based on ethnic or religious animosities, state-sponsored terrorism, or subversion of friendly governments.

• ***Dangers to democracy and reform,*** in the former Soviet Union, Eastern Europe, and elsewhere.

• ***Economic dangers*** to our national security, which could result if we fail to build a strong, competitive and growing economy.

Our armed forces are central to combating the first two dangers and can play a significant role in meeting the second two. Our predictions and conclusions about the nature and characteristics of these dangers will help mold our strategy and size and shape our future military forces.

An Era of New Opportunities

Today, there is promise that we can replace the East-West confrontation of the Cold War with an era in which the community of nations, guided by a common commitment to democratic principles, free-market economics, and the rule of law, can be significantly enlarged.

As Figure 2 shows, beyond new dangers there are new opportunities: realistic aspirations that, if we dedicate ourselves to pursue worthy goals, we can reach a world of greater safety, freedom, and prosperity. Our armed forces can contribute to this objective. In brief, we see new opportunities to:

• Expand and adapt our existing security partnerships and alliances and build a larger community of democratic nations.

• Promote new regional security arrangements and alliances to improve deterrence and reduce the potential for aggression by hostile regional powers.

• Implement the dramatic reductions in the strategic nuclear arsenals of the United States and the former Soviet Union achieved in the Strategic Arms Reduction Talks (START) I and II treaties.

• Protect and advance our security with fewer resources, freeing excess resources to be invested in other areas vital to our prosperity.

New Opportunities

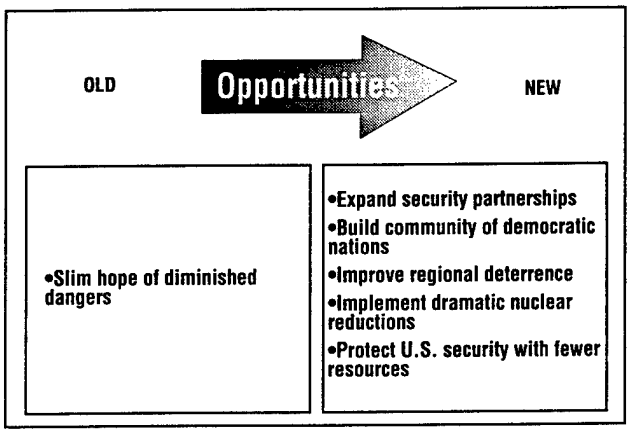


Figure 2

Enduring U.S. Goals

Despite these revolutionary changes in our security environment, the most basic goals of the United States have not changed. They are to:

• Protect the lives and personal safety of Americans, both at home and abroad.

• Maintain the political freedom and independence of the United States with its values, institutions, and territory intact.

- Provide for the well-being and prosperity of the nation and its people.

In addition to these fundamental goals, we have core values that we have an interest in promoting. These include democracy and human rights, the peaceful resolution of conflict, and the maintenance of open markets in the international economic system. The advancement of these core values contributes significantly to the achievement of our fundamental national goals: our nation will be more secure in a world of democratic and pluralistic institutions, and our economic well-being will be enhanced by the maintenance of an open international economic system.

A Strategy of Engagement, Prevention, and Partnership

To protect and advance these enduring goals in this new era, the United States must pursue a strategy characterized by continued political, economic, and military engagement internationally. Such an approach helps to avoid the risks of global instability and imbalance that could accompany a precipitous U.S. withdrawal from security commitments. It also helps shape the international environment in ways needed to protect and advance U.S. objectives over the longer term, and to prevent threats to our interests from arising.

Moreover, we must adapt our defense policies and alliances to meet fast-moving changes both at home and abroad. We and our allies need to modify and build upon the basic bargains upon which our security relationships are based, and begin now to define and create new mutual expectations, arrangements, and institutions to help manage our affairs in the coming decades.

This strategy of engagement will be defined by two characteristics: prevention and partnership. It advocates preventing threats to our interests by promoting democracy, economic growth and free markets, human dignity, and the peaceful resolution of conflict, giving first priority to regions critical to our interests. Our new strategy will also pursue an international partnership for freedom, prosperity, and peace. To succeed, this partnership will require the contributions of our allies and will depend on our ability to establish fair and equitable political, economic, and military relationships with them.

Our primary task, then, as a nation is to strengthen our society and economy for the demanding competitive environment of the 21st century, while at the same time avoiding the risks of precipitous reductions in defense capabilities and the overseas commitments they support. Such reductions could defeat attempts to improve both our overall security situation and our prosperity.

Sustaining and Adapting Alliances

Building a coalition of democracies will be central to achieving this overarching objective. The common values and objectives of democratic nations provide a basis for cooperation across a broad spectrum of policy areas, from deterrence and defense against aggression to the promotion of individual and minority rights. We can strive to make the most of this commonality of values and interests by expanding and adapting mechanisms to facilitate policy coordination and cooperation among democracies.

A continued willingness on the part of the United States to act as a security partner and leader will be an important factor in sustaining cooperation in many areas. Our strategy therefore envisions that the United States will remain the leading security partner in Europe, East Asia, the Near East, and Southwest Asia. However, we must find ways to sustain our leadership at lower cost. For their part, our allies must be sensitive to the linkages between a sustained U.S. commitment to their security on the one hand, and their actions in such areas as trade policy, technology transfer, and participation in multinational security operations on the other.

Finally, we must encourage the spread of democratic values and institutions. In this regard, the collapse of the former Soviet empire presents an unparal-

leled opportunity to bring peace and prosperity to millions of people who have expressed a clear desire to join the community of democracies.

Objectives and Methodology of the Bottom-Up Review

We undertook the Bottom-Up Review to select the right strategy, force structure, modernization programs, and supporting industrial base and infrastructure to provide for America's defense in the post-Cold War era

Figure 3 shows the step-by-step process we used to develop key assumptions, broad principles, and general objectives and translate them into a specific plan for our strategy, forces, and defense resources. These steps included:

- Assessing the post-Cold War era, and particularly the new dangers and opportunities it presents.
- Devising a defense strategy to protect and advance our interests in this new period.
- Constructing building blocks of forces to implement the strategy.
- Combining these force building blocks to produce options for our overall force structure.
- Complementing the force structure with weapons acquisition programs to modernize our forces, defense foundations to sustain them, and policy initiatives to address new dangers and take advantage of new opportunities.

With the Bottom-Up Review now complete, we will utilize its results to build a multiyear plan for America's future security, detailing the forces, programs, and defense budgets the United States needs to protect and advance its interests in the post-Cold War era.

Methodology of the Bottom–Up Review

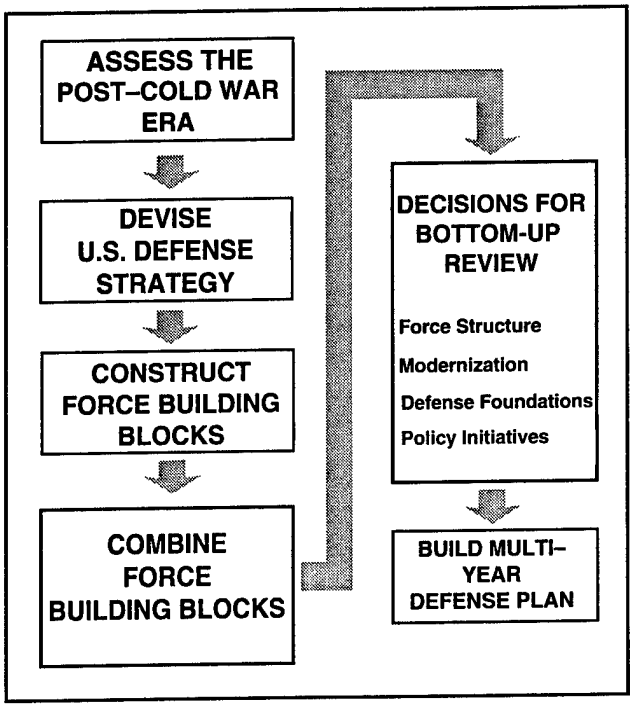


Figure 3

The Bottom-Up Review represented a close collaboration between the civilian and military sectors of the Department of Defense (DoD). Task forces were established — including representatives from the Office of the Secretary of Defense (OSD), the Joint Staff, the unified and specified commands, each of the armed services and, where appropriate, other defense agencies — to review the major issues entailed in planning defense strategy, forces, modernization programs, and other defense foundations. Numerous studies helped to formulate the key issues for decisionmakers and provided the analytical underpinning for the review.

SECTION II

A DEFENSE STRATEGY FOR THE NEW ERA

The requirement to thwart new dangers and seize new opportunities sets the objectives our forces should try to achieve. The discussion below describes in more detail the dangers and opportunities we now foresee and outlines a strategy for dealing with them.

Nuclear Dangers and Opportunities

Dangers posed by nuclear weapons and other weapons of mass destruction (WMD) — that is, biological and chemical weapons — are growing. Beyond the five declared nuclear-weapon states (the United States, Russia, France, Great Britain, and China), at least 20 other nations either have acquired or are attempting to acquire weapons of mass destruction. In most areas where U.S. forces could potentially be engaged on a large scale, such as Korea or the Persian Gulf, our likely adversaries already possess chemical and biological weapons. Moreover, many of these same states (e.g., North Korea, Iraq, and Iran) appear to be embarked upon determined efforts to acquire nuclear weapons.

Weapons of mass destruction in the hands of a hostile power not only threaten U.S. lives but also challenge our ability to use force to protect our interests. The acquisition of nuclear weapons by a regional aggressor would pose very serious challenges. For example, a hostile nuclear-armed state could threaten:

- Its neighbors, perhaps dissuading friendly states from seeking our help to resist aggression.
- Concentrations of U.S. forces deployed in the region.
- Regional airfields and ports critical to U.S. reinforcement operations.
- American cities — either with covertly delivered weapons or, eventually, ballistic or cruise missiles.

We also continue to face nuclear dangers from the former Soviet Union (FSU). Although our relations with Russia are friendly and cooperative, and although the chances of U.S.-Russian military confrontation have declined dramatically and we are cooperating with the Russians to safely reduce their nuclear arsenal, Moscow still controls tens of thousands of nuclear weapons — a factor to be reckoned with should anti-Western elements take control of the Russian government. Even after START II is ratified and implemented, Russia will maintain a formidable nuclear arsenal of 3,000 to 3,500 deliverable weapons.

Moreover, several thousand strategic nuclear weapons from the former Soviet arsenal lie outside Russia. Although the leaders of Ukraine, Kazakhstan, and Belarus have pledged to eliminate the strategic nuclear arsenals on their territories, the disposition of these weapons remains uncertain. While at present we assess that those weapons are secure, increasing political and social disorder in these newly independent states could heighten the risk that nuclear weapons might be used accidentally, in an unauthorized manner, or could fall into the hands of terrorist groups or nations. There is also a danger that the materials, equipment, and know-how needed to make nuclear weapons could leak through porous borders to other nations.

Beyond the promise of continued reductions in the nuclear stockpile of the former Soviet Union, as well as in our own, there are other opportunities for the international community to reduce the danger of nuclear weapons and other weapons of mass destruction. With international cooperation to strengthen and expand existing agreements, it should be possible to slow, if not halt, further proliferation; reduce the size and aggregate destructive power of nuclear, chemical, and biological arsenals; and deter or prevent the actual use of these weapons. This will involve diplomatic means such as strengthening the provisions of and widening participation in the Nuclear Nonproliferation Treaty,

implementing the Chemical Weapons Convention and the Missile Technology Control Regime, and negotiating nuclear testing limitations.

However, in addition to cooperative threat reduction and nonproliferation efforts, the United States will need to retain the capacity for nuclear retaliation against those who might contemplate the use of weapons of mass destruction. We must also continue to explore other ways to improve our ability to counter proliferation, such as active and passive defenses against nuclear, biological, and chemical weapons and their delivery systems.

Addressing Nuclear Dangers and Seizing Opportunities

Given this situation, our strategy for addressing the new dangers from nuclear weapons and other weapons of mass destruction and seizing opportunities to prevent their use must involve a multi-pronged approach.

First, it includes ***nonproliferation*** efforts to prevent the spread of weapons of mass destruction to additional countries through the strengthening of existing controls on the export of WMD technologies and materials and the improvement and expansion of international mechanisms and agreements for limiting and eliminating nuclear, biological, and chemical weapons.

Second, we must pursue ***cooperative threat reduction*** with the former Soviet Union, aimed at eliminating its stockpiles of nuclear, chemical, and biological weapons and preventing the spread of weapons of mass destruction, their components, and related technology and expertise within and beyond FSU borders.

While these first two efforts involve primarily diplomatic measures, DoD must also focus on ***counterproliferation*** efforts to deter, prevent, or defend against the use of WMD if our nonproliferation endeavors fail. Specifically, to address the new nuclear dangers, DoD must emphasize:

- Improvements in intelligence — both overall WMD threat assessments and timely intelligence and detection to support battlefield operations and management.

- Improvements in the ability of both our general purpose and special operations forces to seize, disable, or destroy arsenals of nuclear, biological, and chemical weapons and their delivery systems.

- Maintenance of flexible and robust nuclear and conventional forces to deter WMD attacks through the credible threat of devastating retaliation.

- Development of ballistic and cruise missile defenses, focused on the deployment of advanced theater missile defenses to protect forward-deployed U.S. forces and provision of the capability for a limited defense of the United States.

- Improved passive defenses, including better individual protective gear and better antidotes and vaccines for our forces in the event they are exposed to chemical or biological attacks.

- Other improved equipment, capabilities, and tactics to minimize the vulnerability of U.S. forces to WMD attacks.

- Better technologies to detect weapons transported covertly into the United States and elsewhere for terrorist purposes.

Regional Dangers and Opportunities

Regional dangers include a host of threats: large-scale aggression; smaller conflicts; internal strife caused by ethnic, tribal, or religious animosities; state-sponsored terrorism; subversion of friendly governments; insurgencies; and drug trafficking. Each of these dangers jeopardizes, to varying degrees, interests important to the United States.

Specific examples of these new regional dangers include:

- The continuing military preparations underway in North Korea, including the development of nuclear weapons and longer-range missiles — both of which are viewed with alarm by their neighbors and could spur massive rearmament throughout East Asia.

- The ambitions of Iraq or Iran to dominate Southwest Asia, which continue to threaten our friends and allies in the Persian Gulf region and could endanger global economic stability through limiting access to oil supplies.

- The continuing civil war in Croatia and Bosnia, with its terrible human suffering and potential spillover into the remainder of the former Yugoslavia and other neighboring states.

- The struggles in central and eastern Europe as many states seek to consolidate democracy and build market economies, which, if this difficult transition fails, could produce internal instability and regional conflict.

- State-sponsored terrorism which increasingly brings its violence within U.S. borders.

- Drug trafficking in Latin America and elsewhere which endangers the lives, health, and livelihoods of Americans.

Beyond these dangers, there are also real opportunities. During the Cold War, repressive regimes that were direct adversaries of the United States dominated vast regions of the globe. Today, the countries that pose direct dangers to us are far fewer, and the countries that may join us in thwarting the remaining regional dangers are far more numerous.

Addressing Regional Dangers and Seizing Opportunities

To address the new regional dangers and seize new opportunities, we have developed a multifaceted strategy based on defeating aggressors in major regional conflicts, maintaining overseas presence to deter conflicts and provide regional stability, and conducting smaller-scale intervention operations, such as peace enforcement, peacekeeping, humanitarian assistance, and disaster relief to further U.S. interests and objectives.

Major Regional Conflicts. The United States will continue to have important interests and allies in many regions of the world, from Europe through Southwest Asia, into East Asia, and elsewhere. Regional aggressors represent a danger that must be deterred and, if necessary, defeated by the military capability of the United States and its allies. Moreover, if we were to be drawn into a war in response to the armed aggression of one hostile nation, another could well be tempted to attack its neighbors — especially if it were convinced the United States and its allies did not possess the requisite military capability or will to oppose it.

Therefore, it is prudent for the United States to maintain sufficient military power to be able to win two major regional conflicts that occur nearly simultaneously. With this capability, we will be confident, and our allies as well as potential enemies will know, that a single regional conflict will not leave our interests and allies in other regions at risk.

Further, sizing our forces for two major regional conflicts provides a hedge against the possibility that a future adversary might one day confront us with a larger-than-expected threat, and then turn out, through doctrinal or technological innovation, to be more capable than we expect, or enlist the assistance of other

nations to form a coalition against our interests. The dynamic and unpredictable post-Cold War environment demands that we maintain military capabilities flexible and responsive enough to cope with unforeseen dangers. Thus, U.S. forces will be structured to achieve decisive victory in two nearly simultaneous major regional conflicts and to conduct combat operations characterized by rapid response and a high probability of success, while minimizing the risk of significant American casualties.

Overseas Presence. Stationing and deploying U.S. military forces overseas in peacetime is an essential element in dealing with new regional dangers and pursuing new opportunities.

The peacetime overseas presence of our forces is the single most visible demonstration of our commitment to defend U.S. and allied interests in Europe, Asia, and elsewhere around the world. The presence of U.S. forces deters adventurism and coercion by potentially hostile states, reassures friends, enhances regional stability, and underwrites our larger strategy of international engagement, prevention, and partnership. It also gives us a stronger influence, both political and economic as well as military, in the affairs of key regions.

By stationing forces abroad we also improve our ability to respond effectively to crises or aggression when they occur. Our overseas presence provides the leading edge of the rapid response capability that we would need in a crisis. Moreover, our day-to-day operations with allies improve the ability of U.S. and allied forces to operate effectively together.

Finally, our routine presence helps to ensure our access to the facilities and bases we would need during a conflict or contingency, both to operate in a given region and to deploy forces from the United States to distant regions.

Our overseas presence forces take several forms:

- Permanent or long-term overseas stationing of U.S. ground, air, and maritime forces.

- Periodic and temporary deployments of forces in response to crises or to enhance deterrence through joint training with allied and friendly forces.

- Prepositioning of military equipment and supplies to facilitate a rapid American military response should a crisis occur.

Army and Air Force units are permanently stationed in regions where the United States has important and enduring interests and wants to make clear that aggression will be met by a U.S. military response. Because these units are also part of the forces needed to fight and win two major regional conflicts, we must retain a significant presence in key regions. However, with the demise of the global Soviet threat, we can protect our interests and prepare for potential regional conflicts at significantly reduced levels of forward-deployed forces.

Maritime overseas presence forces range widely across the world's oceans, demonstrating to both friends and potential adversaries that the United States has global interests and the ability to bring military power quickly to bear anywhere in the world. In addition, maritime forces have the operational mobility and political flexibility to reposition to potential trouble spots by unilateral U.S. decision — whether to signal America's interest in resolving a crisis, evacuate American citizens from danger, render humanitarian assistance, or conduct strikes against countries supporting terrorism or defying U.N. resolutions.

Peacekeeping, Peace Enforcement, and Other Intervention Operations. While deterring and defeating major regional aggression will be the most demanding requirement of the new defense strategy, our emphasis on engagement, prevention, and partnership means that, in this new era, U.S. military forces are more likely to be involved in operations short of declared or intense warfare. Events of the past few years have already borne this out, as our armed forces have been involved in a wide range of so-called "intervention" operations, from aiding typhoon victims in Bangladesh during Operation Sea Angel, to delivering

humanitarian relief to the former Soviet Union under Operation Provide Hope, to conducting the emergency evacuation of U.S. citizens from Liberia during Operation Sharp Edge, to restoring order and aiding the victims of the civil war in Somalia during Operation Restore Hope.

Through overseas presence and power projection, our armed forces can help deter or contain violence in volatile regions where our interests are threatened. In some circumstances, U.S. forces can serve a peacekeeping role, monitoring and facilitating the implementation of cease-fire and peace agreements with the consent of the belligerent parties as part of a U.N. or other coalition presence. In more hostile situations, the United States might be called upon, along with other nations, to provide forces to compel compliance with international resolutions or to restore order in peace enforcement operations. In some cases, such as Operation Just Cause in Panama, we may intervene unilaterally to protect our interests. Finally, our armed forces will continue to play an important role in the national effort to halt the importation of illegal drugs to the United States.

In the future, there are likely to be many occasions when we are asked to intervene with military force overseas. In deciding where, when, and how our military should be employed for peace enforcement, peacekeeping, humanitarian relief, or similar types of operations, we will need to consider each situation individually and carefully weigh several factors:

- Does participation advance U.S. national interests?
- Are the objectives clear and attainable?
- How will the intervention affect our other defense obligations?
- Can the United States contribute capabilities and assets necessary for the success of the mission?

Because these operations are so diverse, the forces and capabilities needed to conduct them will vary. Fortunately, the military capabilities needed for these operations are largely those maintained for other purposes — major regional conflicts and overseas presence. Thus, although specialized training and equipment may often be needed, the forces required will, for the most part, be selected elements of those general purpose forces maintained for other, larger military operations. There are some forces and capabilities that are particularly well suited for intervention operations – for example, special operations forces, including psychological operations and civil affairs units.

New Dangers to Democracy and Opportunities for Democratic Reform

The post-Cold War trend toward democracy throughout much of the world is a tremendously favorable one for the security of the United States. Our values are ascendant. Peaceful resolution of disputes is more likely as democracy spreads.

This positive trend, however, is reversible. In most former communist countries, democratic institutions are not yet firmly established, and market reforms have yet to produce tangible improvements in standards of living. The reversal of reforms and the emergence of ultranationalist authoritarianism, particularly in Russia, would substantially alter the security situation for the United States.

Addressing Dangers to Democracy

U.S. strategy will seek to draw democratizing states in central and eastern Europe, Russia, Ukraine, and other former Soviet republics into deeper partnership. We and our allies should:

- Offer carefully targeted economic aid, training assistance, and education and information programs to help underwrite democratization and market reforms.
- Continue and intensify our program of defense-to-defense contacts to foster mutual understanding and help these countries institute democratic, civilian control over the military.

• Provide assistance to secure and reduce the Russian nuclear arsenal and eliminate strategic nuclear armaments in the non-Russian republics.

• Solicit cooperation in regional security initiatives, such as multilateral peacekeeping operations.

Collectively, such measures constitute "defense by other means" against the potential consequences of failure of reform in Russia and elsewhere. We also need to work with the military in other countries to sustain democracy.

As a hedge against possible reversals, we should strengthen our bilateral and multilateral ties in central and eastern Europe. We must also retain the means to rebuild a larger force structure, should one be needed in the future to confront an emergent authoritarian and imperialistic Russia reasserting its full military potential.

New Economic Dangers and Opportunities

The final — and in the post-Cold War period, perhaps most important — set of dangers that U.S. strategy must confront is economic. In recent years, the U.S. economy has been plagued by an enormous and growing federal debt, sluggish growth, inadequate job creation, and a large trade imbalance. Further, our growing dependence on imported petroleum constitutes an economic danger of its own.

The Department of Defense can help address these economic dangers. DoD can help America seize the opportunity presented by the end of the Cold War to enhance its economic security. We must stress the productive reinvestment of defense resources, facilities, and technology into the civilian economy. Placing new emphasis on key technologies — information and manufacturing technologies and advanced materials — will help strengthen both the military and civilian sectors. With careful restructuring of our forces and support infrastructure, we can maintain capabilities sufficient to meet our present and future security needs while reducing the overall level of resources devoted to defense.

Beyond simply using fewer resources, the Department of Defense will actively assist in the transition of the U.S. economy away from a Cold War footing. Such assistance will come in the form of providing transition assistance to individuals departing the military, facilitating the conversion of defense industries, and encouraging the freer flow of technologies between the civilian and military sectors.

Sustaining a healthy free trade regime and, within that, expanding U.S. exports and reducing trade imbalances will be key to our future economic growth. Addressing these issues productively will hinge on maintaining sound political and economic relationships with our trading partners. Trade relations are intertwined with security relations: In most cases, we enjoy close security relationships with our trading partners. Our bilateral and multilateral security arrangements are tangible evidence of our interest in regions, and they help ensure that the United States will have a "seat at the table" in forums for political and economic decisionmaking.

Military power supports and is supported by political and economic power. Likewise, security relationships support and are supported by trade relationships. We cannot expect to improve our trade relations or our trading position with our allies if we withdraw from our security relationships. At the same time, we must recognize that domestic support for overseas commitments depends in part on the perception of fairness in trade and other matters.

Objectives of Our Armed Forces

Our examination of new dangers and opportunities leads to the following major objectives for our armed forces.

To meet the new ***nuclear danger*** and seize the opportunities in this area, our objectives are to:

- Deter the use of nuclear, biological, or chemical weapons against the United States, its forces, and its allies.

- Halt or at least slow the proliferation of nuclear, biological, and chemical weapons.

- Develop capabilities to locate and destroy WMD storage, production, and deployment facilities of potential aggressors and defend our forward-deployed forces from such weapons.

- Continue to reduce the nuclear arsenals of the former Soviet Union and the United States and so reduce the threat of nuclear war.

- Minimize the exposure and the vulnerability of U.S. forces to nuclear, biological, or chemical weapons use.

To meet new ***regional dangers*** and seize the opportunities that exist to reduce these dangers, our objectives are to:

- Deter and, if necessary, defeat major aggression in regions important to the United States.

- Be capable of fighting and winning two major regional conflicts nearly simultaneously.

- Prepare U.S. forces to participate effectively in multilateral peace enforcement and unilateral intervention operations.

- Continue to adapt existing alliances and build new ones to enhance regional and global security.

To meet the ***dangers to democratic reform*** and seize the opportunity for a further spread of democracy, our objectives are to:

- Use military-to-military contacts to help foster democratic values in other countries.

- Protect fledgling democracies from subversion and external threats.

To meet the ***dangers to American economic prosperity*** and seize the opportunity to accelerate U.S. economic growth and promote global economic well-being, our objectives are to:

- Redirect resources to investments that improve both our defense posture and our competitive position economically.

- Facilitate reinvestment that allows defense industries to shift to nondefense production.

- Support the development of dual-use technologies and encourage the freer flow of technology between the military and civilian sectors.

- Use our long-standing security relationships with key allies and partners to build a bridge to greater economic cooperation and to sustain and enhance global free trade.

- Actively assist nations in making the transition from controlled to market economies.

Building Future Capabilities: Guiding Principles

While the objectives outlined above provide a framework for determining our force structure and modernization requirements, certain other underlying principles guided our effort during the Bottom-Up Review. In his inaugural address, President Clinton pledged to keep America's military the best-trained, best-equipped, best-prepared fighting force in the world. To fulfill that pledge, we must keep it the focus of our effort throughout the planning, programming, and budgeting process.

First, we must ***keep our forces ready to fight***. We have already witnessed the challenges posed by the new dangers in operations like Just Cause (Panama), Desert Storm (Iraq), and Restore Hope (Somalia). Each of these were "come as you are" campaigns with little time to prepare our forces for the challenges they met.

The new dangers thus demand that we keep our forces ready to fight as a top priority in allocating scarce defense resources. We must adequately fund operations and maintenance accounts, maintain sufficient stocks of spare parts, keep our forces well-trained and equipped, and take the other steps essential to preserving readiness.

A key element of maintaining forces ready to fight is to ***maintain the quality of our people***, so that they remain the best fighting force in the world. First, this means keeping our personnel highly motivated by treating them fairly and maintaining their quality of life. It also means continuing to recruit talented young men and women, expanding career opportunities for all service members, and putting in place programs to ease the transition to civilian life for departing military personnel as we bring down the size of our forces.

We must also ***maintain the technological superiority*** of our weapons and equipment. Operation Desert Storm demonstrated that we produce the best weapons and military equipment in the world. This technological edge helps us to achieve victory more swiftly and with fewer casualties. We must design a balanced modernization program that safeguards this edge and the necessary supporting industrial base without buying more weapons than we need or can afford.

SECTION III

FORCES TO IMPLEMENT THE DEFENSE STRATEGY

We describe the forces and capabilities needed to implement our defense strategy and guide the construction of our overall force structure as "building blocks." Force building blocks are a valuable analytical tool that allow us to see the linkage between certain types and quantities of forces and the tasks they are meant to perform. They also make clearer the price to be paid in making cuts in the military structure: eliminating a force building block can mean eliminating the capability to conduct a particular task.

Four broad classes of potential military operations were used in the Bottom-Up Review to evaluate the adequacy of future force structure alternatives:

- Major regional conflicts (MRCs).
- Smaller-scale conflicts or crises that would require U.S. forces to conduct peace enforcement or intervention operations.
- Overseas presence — the need for U.S. military forces to conduct normal peacetime operations in critical regions.
- Deterrence of attacks with weapons of mass destruction, either against U.S. territory, U.S. forces, or the territory and forces of U.S. allies.

This list is not all-inclusive. We will provide forces and military support for other types of operations, such as peacekeeping, humanitarian assistance, and to counter international drug trafficking. However, while such operations often call for small numbers of specialized forces or assets, they are not likely to be major determinants of general purpose force structure. However, they could require specialized training and equipment.

Our analysis of each of these four types of operations allowed us to construct, for planning purposes, building blocks of the forces required for them. By combining the building blocks and adjusting them to account for judgments about the need to conduct simultaneous operations, we were able to determine the number and mix of active and reserve forces that we will need to carry out our defense strategy.

Major Regional Conflicts

During the Cold War, U.S. military planning was dominated by the need to confront numerically superior Soviet forces in Europe, the Far East, and Southwest Asia. Now, the focus is on the need to project power into regions important to U.S. interests and to defeat potentially hostile regional powers, such as North Korea or Iraq. Although these nations are unlikely to threaten the United States directly, they and other countries like them have shown that they are willing and able to field forces sufficient to threaten important U.S. interests, friends, and allies. Operation Desert Storm was a powerful demonstration of the need to counter such regional aggression.

Potential regional aggressors are expected to be capable of fielding military forces in the following ranges:

- 400,000 – 750,000 total personnel under arms
- 2,000 – 4,000 tanks
- 3,000 – 5,000 armored fighting vehicles
- 2,000 – 3,000 artillery pieces
- 500 – 1,000 combat aircraft
- 100 – 200 naval vessels, primarily patrol craft armed with surface-to-surface missiles, and up to 50 submarines
- 100 – 1,000 Scud-class ballistic missiles, some possibly with nuclear, chemical, or biological warheads.

Military forces of this size could threaten regions important to the United States if allied or friendly states were unable to match their power. Hence, we must prepare our forces to assist those of friends and allies in deterring, and ultimately defeating, aggression should it occur.

Scenarios as Planning Tools. Every war that the United States has fought has been different from the last, and different from what defense planners had envisioned. For example, the majority of the bases and facilities used by the United States and its coalition partners in Operation Desert Storm were built in the 1980s, when we envisioned a Soviet invasion through Iran to be the principal threat to the Gulf region. In planning forces capable of fighting and winning major regional conflicts, we must avoid preparing for past wars. History suggests that we most often deter the conflicts that we plan for and actually fight the ones we do not anticipate.

For planning and assessment purposes, we have selected two illustrative scenarios that are both plausible and posit demands characteristic of those that could be posed by conflicts with other potential adversaries. Figure 4 displays the scenarios and their relationship to planning for force employment across a range of potential conflicts. While a number of scenarios were examined, the two that we focused on most closely in the Bottom-Up Review envisioned aggression by a remilitarized Iraq against Kuwait and Saudi Arabia, and by North Korea against the Republic of Korea.

Scenarios as Planning Tools

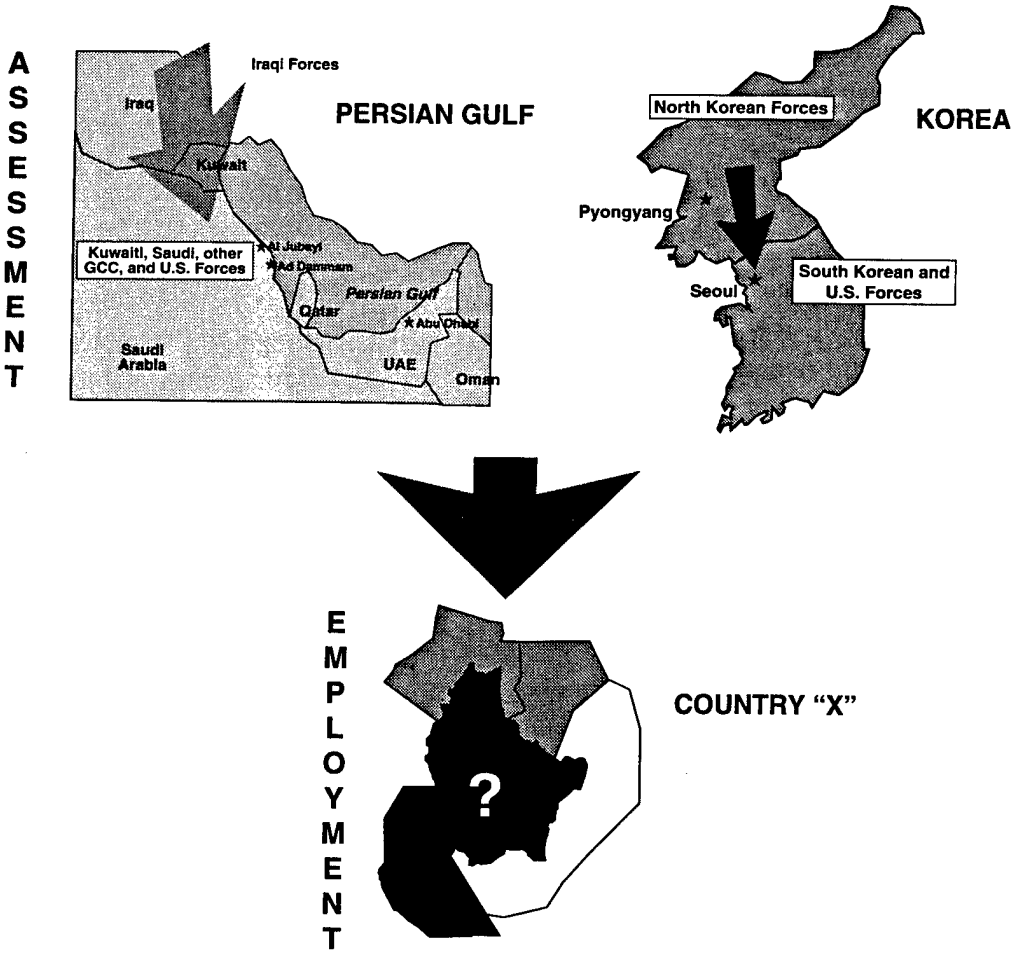


Figure 4

Neither of these scenarios should be regarded as a prediction of future conflicts, but each provides a useful representation of the challenge that could be presented by a well-armed regional power initiating aggression thousands of miles from the United States. As such, the scenarios serve as yardsticks against which to assess, in gross terms, the capabilities of U.S. forces.

In each scenario, we examined the performance of projected U.S. forces in relation to critical parameters, including warning time, the threat, terrain, weather, duration of hostilities, and combat intensity. Overall, these scenarios were representative of likely ranges of these parameters.

Both scenarios were developed for analyses conducted by the Joint Staff. Each assumed a similar enemy operation: an armor-heavy, combined-arms offensive against the outnumbered forces of a neighboring state. U.S. forces, most of which were not presumed to be present in the region when hostilities commenced, had to deploy to the region quickly, supplement indigenous forces, halt the invasion, and defeat the aggressor.

Such a "short notice" scenario, in which only a modest number of U.S. forces are in a region at the outset of hostilities, is both highly stressing and plausible. History shows that we frequently fail to anticipate the location and timing of aggression, even large-scale attacks against our interests. In such cases, it may also not be possible, prior to an attack, to reach a political consensus on the proper U.S. response or to convince our allies to grant U.S. forces access to facilities in their countries.

We also expect that the United States will often be fighting as the leader of a coalition, with allies providing some support and combat forces. As was the case in Desert Storm, the need to defend common interests should prompt our allies in many cases to contribute capable forces to a war effort. However, our forces must be sized and structured to preserve the flexibility and the capability to act unilaterally, should we choose to do so.

The Four Phases of U.S. Combat Operations

Our first priority in preparing for regional conflicts is to prevent them from ever occurring. This is the purpose of our overseas presence forces and operations, joint exercises, and other military capabilities — to deter potential regional aggressors from even contemplating an attack. Should deterrence fail and conflict occur, it is envisioned that combat operations would unfold in four main phases.

Phase 1: Halt the invasion. The highest priority in defending against a large-scale attack will most often be to minimize the territory and critical facilities that an invader can capture. Should important strategic assets fall, the invader might attempt to use them as bargaining chips. In addition, stopping an invasion quickly may be key to ensuring that a threatened ally can continue its crucial role in the collective effort to defeat the aggressor. Further, the more territory the enemy captures, the greater the price to take it back: The number of forces required for a counteroffensive to repel an invasion can increase, with correspondingly greater casualties, depending on the progress the enemy makes. In the event of a short-warning attack, more U.S. forces would need to deploy rapidly to the theater and enter the battle as quickly as possible.

Phase 2: Build up U.S. combat power in the theater while reducing the enemy's. Once an enemy attack had been stopped and the front stabilized, U.S. and allied efforts would focus on continuing to build up combat forces and logistics support in the theater while reducing the enemy's capacity to fight. Land, air, maritime, and special operations forces from the United States and coalition countries would continue to arrive. These forces would seek to ensure that the enemy did not regain the initiative on the ground, and they would mount sustained attacks to reduce the enemy's military capabilities in preparation for a combined-arms counteroffensive.

Phase 3: Decisively defeat the enemy. In the third phase, U.S. and allied forces would seek to mount

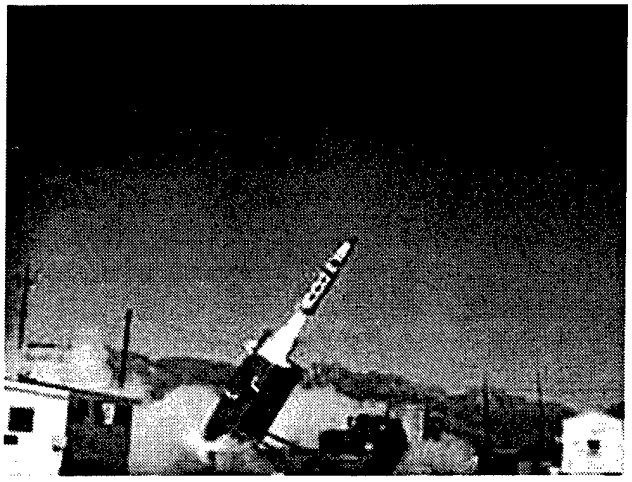
a large-scale, air-land counteroffensive to defeat the enemy decisively by attacking his centers of gravity, retaking territory he had occupied, destroying his war-making capabilities, and successfully achieving other operational or strategic objectives.

Phase 4: Provide for post-war stability. Although a majority of U.S. and coalition forces would begin returning to their home bases, some forces might be called upon to remain in the theater after the enemy had been defeated to ensure that the conditions that resulted in conflict did not recur. These forces could help repatriate prisoners, occupy and administer some or all of the enemy's territory, or ensure compliance with the provisions of war-termination or cease-fire agreements.

Forces for Combat Operations

Described below are the types of forces that are needed to conduct joint combat operations in all four phases of an MRC.

Forces for Phase 1. Primary responsibility for the initial defense of their territory rests, of course, with our allies. As forces of a besieged country move to blunt an attack, U.S. forces already in the theater would move rapidly to provide assistance. However, as already mentioned, we are drawing down our overseas presence in response to the end of the Cold War. Thus, the bulk of our forces, even during the early stages of a conflict, would have to come from the United States. This places a premium on rapidly deployable yet highly lethal forces to blunt an attack.



An ATACMS launch.

The major tasks to be performed in this phase and beyond are:

- Help allied forces establish a viable defense that halts enemy ground forces before they can achieve critical objectives.

- Delay, disrupt, and destroy enemy ground forces and damage the roads along which they are moving, in order to halt the attack. U.S. attacks would be mounted by a combination of land- and sea-based strike aircraft and heavy bombers using precision-guided munitions; long-range tactical missiles; ground maneuver forces with antiarmor capabilities; and special operations forces.

- Protect friendly forces and rear-area assets from attack by aircraft or cruise and ballistic missiles, using land- and sea-based aircraft, ground- and sea-based surface-to-air missiles, and special operations forces.

- Establish air superiority and suppress enemy air defenses as needed, including those in rear areas and those accompanying invading ground forces, using land- and sea-based strike and jamming aircraft as well as surface-to-surface missiles, such as the Army Tactical Missile System (ATACMS).

- Destroy high-value targets, such as weapons of mass destruction, and degrade the enemy's ability to prosecute military operations through attacks focused on his central command, control, and communications facilities. For such attacks, we would rely heavily on long-range bombers and land- and sea-based strike aircraft using precision-guided munitions, and on cruise missiles. Special operations forces would also play an important role in such attacks.

- Establish maritime superiority, using naval task forces with mine countermeasure ships, in order to ensure access to ports and sea lines of communication, and as a precondition for amphibious assaults.

Forces for Phase 2. Many of the same forces employed in Phase 1 would be used in the second phase to perform similar tasks — grinding down the enemy's military potential while additional U.S. and other coalition combat power was brought into the region. As more land- and sea-based air forces arrived, emphasis would shift from halting the invasion to isolating enemy ground forces and destroying them, destroying enemy air and naval forces, destroying stocks of supplies, and broadening attacks on military-related targets in the enemy's rear area. These attacks could be supplemented with direct and indirect missile and artillery fire from ground, air, and naval forces.

Meanwhile, other U.S. forces, including heavy ground forces, would begin arriving in the theater to help maintain the defensive line established at the end of Phase 1 and to begin preparations for the counteroffensive.

Forces for Phase 3. The centerpiece of Phase 3 would be the U.S. and allied counteroffensive, aimed at engaging, enveloping, and destroying or capturing enemy ground forces occupying friendly territory. Major tasks within the counteroffensive include:

- Breaching tactical and protective minefields.

- Maneuvering to envelop or flank and destroy enemy forces, including armored vehicles in dug-in positions.

- Conducting or threatening an amphibious invasion.

- Applying air power using precision-guided munitions in support of ground forces and for deep interdiction attacks.

- Dislodging and defeating infantry fighting from dug-in positions, and defeating light infantry on urban terrain.

- Destroying enemy artillery.

- Locating and destroying mobile enemy reserves.

Combat power in this phase would include highly mobile armored, mechanized, and air assault forces, supported by the full complement of air power, special operations forces, and land- and sea-based fire support. Amphibious forces would provide additional operational flexibility to the theater commander.

Forces for Phase 4. Finally, a smaller complement of joint forces would remain in the theater once the enemy had been defeated. These forces might include a carrier battle group, one to two wings of fighters, a division or less of ground forces, and special operations units.

Supporting Capabilities

The foregoing list of forces for the various phases of a major regional conflict included only combat force elements. Several types of support capabilities would play essential roles in all phases.

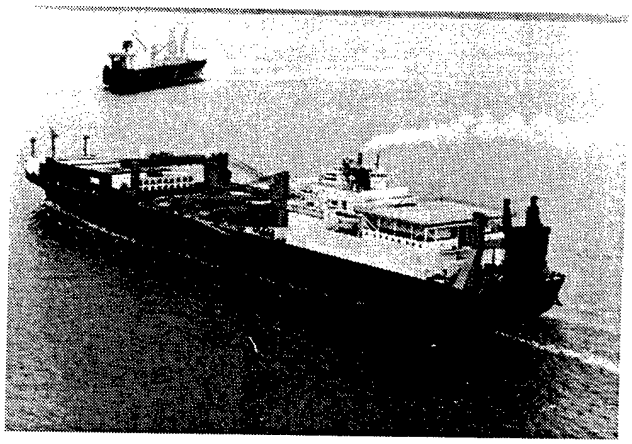
U.S. Marines conducting amphibious assault exercise.

Airlift. Adequate airlift capacity is needed to bring in forces and material required for the first weeks of an operation. In Operations Desert Shield/Desert Storm, the United States airlifted to the Gulf region, on average, more than 2,400 tons of material per day. We anticipate that at least the same level of lift capacity would be needed to support high-intensity military operations in the opening phase of a future MRC and to help sustain operations thereafter.

Prepositioning. Prepositioning heavy combat equipment and supplies, both ashore and afloat, can greatly reduce both the time required to deploy forces to distant regions and the number of airlift sorties devoted to moving such supplies. Initiatives now underway will accelerate the arrival of heavy Army forces overseas in response to crises.

Sealift. In any major regional conflict, most combat equipment and supplies would be transported by sea. While airlift and prepositioning provide the most rapid response for deterrence and initial defense, the deployment of significant heavy ground and air forces, their support equipment, and sustainment must come by sea.

Battlefield Surveillance; Command, Control, and Communications. Accurate information on the location and disposition of enemy forces is a prerequisite for effective military operations. Hence, our planning envisions the early deployment of reconnaissance and command and control aircraft and ground-based assets to enable our forces to see the enemy and to pass information quickly through all echelons of our forces. Total U.S. intelligence and surveillance capability will be less than it was during the Cold War, but it will be better able to provide timely information to battlefield commanders. Advanced systems — such as the Joint Surveillance and Target Attack Radar System (JSTARS), the upgraded Airborne Warning and Control System (AWACS), and the Milstar satellite communications system — will ensure that U.S. forces have a decisive advantage in tactical intelligence and communications.



Maritime prepositioning ships.

Advanced Munitions. As coalition operations in the Gulf War demonstrated, advanced precision-guided munitions can dramatically increase the effectiveness of a fighting force. Precision-guided munitions already in the U.S. inventory (for example, laser-guided bombs) as well as new types of munitions still under development are needed to ensure that U.S. forces can operate successfully in future MRCs and other types of conflicts. New "smart" and "brilliant" munitions under development hold promise of dramatically improving the ability of U.S. air, ground, and maritime forces to destroy enemy armored vehicles and halt invading ground forces, as well as destroy fixed targets at longer ranges, thus reducing exposure to enemy air defenses.

Aerial Refueling. Large numbers of aerial-refueling aircraft would be needed to support many components of a U.S. theater campaign. Fighter aircraft deploying over long distances require in-flight refueling. Airlifters can carry more cargo longer distances if aerial refueling is available en route. Aerial surveillance and control platforms, such as AWACS and JSTARS, also need airborne refueling in order to achieve maximum mission effectiveness.

The MRC Building Block

In planning our future force structure and allocating resources, we established force levels and support objectives that should enable us to win one MRC

across a range of likely conflicts. Our detailed analyses of possible future MRCs, coupled with military judgment as to the outcomes, suggest that the following forces will be adequate to execute the strategy outlined above for a single MRC:

- 4 – 5 Army divisions
- 4 – 5 Marine Expeditionary Brigades
- 10 Air Force fighter wings
- 100 Air Force heavy bombers
- 4 – 5 Navy aircraft carrier battle groups
- Special operations forces

These forces constitute a prudent building block for force planning purposes. In the event of a conflict, our response would depend on the nature and scale of the aggression and on circumstances elsewhere in the world. If the initial defense failed to halt the invasion quickly, or if circumstances in other parts of the world permitted, U.S. decisionmakers might choose to commit more forces than those listed (for example, two additional Army divisions). These added forces would help either to achieve the needed advantage over the enemy, to mount a decisive counteroffensive, or to accomplish more ambitious war objectives, such as the complete destruction of the enemy's war-making potential. But our analysis also led us to the conclusion that enhancements to our military forces, focused on ensuring our ability to conduct a successful initial defense, would both reduce our overall ground force requirements and increase the responsiveness and effectiveness of our power projection forces.

Fighting Two MRCs

In this context, we decided early in the Bottom-Up Review that the United States must field forces sufficient to fight and win two major regional conflicts that occur nearly simultaneously. This is prudent for two reasons.

First, we need to avoid a situation in which the United States in effect makes simultaneous wars more likely by leaving an opening for potential aggressors to attack their neighbors, should our engagement in a war in one region leave little or no force available to respond effectively to defend our interests in another.

Second, fielding forces sufficient to win two wars nearly simultaneously provides a hedge against the possibility that a future adversary — or coalition of adversaries — might one day confront us with a larger-than-expected threat. In short, it is difficult to predict precisely what threats we will confront ten to twenty years from now. In this dynamic and unpredictable post-Cold War world, we must maintain military capabilities that are flexible and sufficient to cope with unforeseen threats.

For the bulk of our ground, naval, and air forces, fielding forces sufficient to provide this capability involves duplicating the MRC building block described above. However, in planning our overall force structure, we must recognize two other factors. First, we must have sufficient strategic lift to deploy forces when and where they are needed. Second, certain specialized high-leverage units or unique assets might be "dual tasked," that is, used in both MRCs. For example, certain advanced aircraft — such as B-2s, F-117s, JSTARs, and EF-111s — that we have purchased in limited numbers because of their expense would probably need to shift from the first to second MRC.

Force Enhancements to Support Our Strategy

As previously mentioned, we have already undertaken or are planning a series of enhancements to our forces to improve their capability, flexibility, and lethality. These improvements are geared especially toward buttressing our ability to conduct a successful initial defense in any major regional conflict.

As shown in Figure 5, the enhancements include improving: (1) strategic mobility, through more prepositioning and enhancements to airlift and sealift; (2) the strike capabilities of aircraft carriers; (3) the lethality of Army firepower; and (4) the ability of long-range bombers to deliver conventional smart munitions.

Strategic Mobility. Our plans call for substantial enhancements to our strategic mobility — most of which were first identified in the 1991 Mobility Requirements Study (MRS).

First, we will either continue the program to purchase and deploy the C-17 airlifter or purchase other airlifters to replace our aging C-141 transport aircraft. Development of the C-17 has been troubled from the start and we will continue to monitor the program's progress closely, but significant, modern, flexible airlift capacity is essential to our defense strategy. A decision on the C-17 will be made after a thorough review by the Defense Acquisition Board is completed in the fall of 1993.

Force Enhancements to Halt a Short-Warning Attack

		Today's Force	Future Force
Persian Gulf Region	Prepo	1 Battalion Training Set 1 Maritime Prepositioning Ship (MPS) Squadron 7 Prepositioning Ships	2 Brigade Sets ashore 1 Brigade Set afloat* 1 MPS Squadron 7 Prepositioning Ships
	Forces	1 Carrier Battle Group (Tether)	1 Carrier Battle Group (Tether)
PHASE I **Halt Invasion**		**FAIR** – Lack of heavy forces to help stop invader – Insufficient prepositioning – Limited antiarmor capability – Limited anti-tactical ballistic missile (ATBM) capability	**GOOD** – 3 heavy brigade sets of prepositioned equipment – Increased early-arriving land-based and carrier aircraft and long–range bombers – Improved antiarmor precision-guided munitions – Improved ATBM capability
PHASE II **Build Up Forces in Theater for Counteroffensive**		**FAIR** – Slow closure due to modest sealift capability	**GOOD** – Airlift and sealift upgrades support rapid closure of heavy forces
KOREA	Prepo	1 Brigade-Sized Marine Expeditionary Force (MEF) 1 MPS Squadron	1 Brigade Set ashore 1 Brigade Set afloat* 2 Brigade-Sized MEFs (2 MPS Squadrons)
	Forces	1 Division (2 Brigades) 2.4 Fighter Wings 1 Carrier Battle Group 1 MEF	1 Division (2 Brigades) 2.4 Fighter Wings 1 Carrier Battle Group 1 MEF
PHASE I **Halt Invasion**		**GOOD** – Substantial in-place forces – Established command, control, communications, and intelligence (C3I) network – Rapid reinforcement from Japan, Okinawa – Limited ATBM capability	**GOOD** – 2 heavy brigade sets of prepositioned equipment – Increased early-arriving land-based and carrier aircraft and long–range bombers – Improved antiarmor precision-guided munitions – Improved ATBM capability
PHASE II **Build Up Forces in Theater for Counteroffensive**		**FAIR** – Slow closure due to modest sealift capability	**GOOD** – Airlift and sealift upgrades support rapid closure of heavy forces

* Brigade set would be positioned to "swing" to either region.

Figure 5

Second, we plan to store a brigade set of heavy Army equipment afloat; the ships carrying this material would be positioned in areas from which they could be sent on short notice either to the Persian Gulf or to Northeast Asia. Other prepositioning initiatives would accelerate the arrival of heavy Army units in Southwest Asia and Korea.

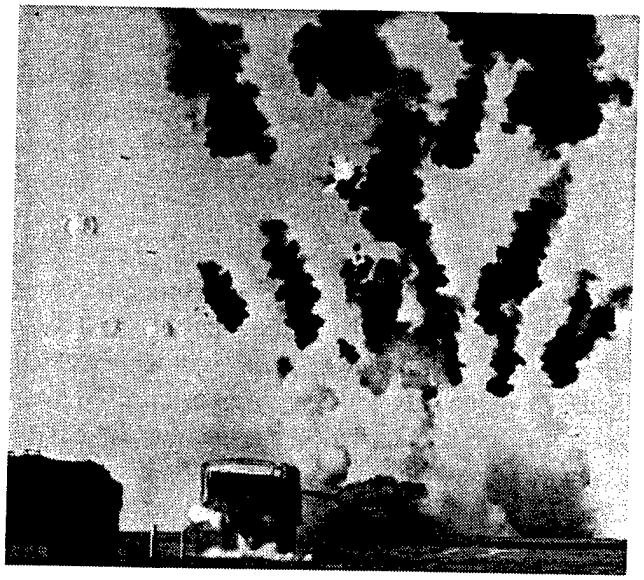
Third, we will increase the capacity of our surge sealift fleet to transport forces and equipment rapidly from the United States to distant regions by purchasing additional roll-on/roll-off ships.

Fourth, we will improve the readiness and responsiveness of the Ready Reserve Force (RRF) through a variety of enhancements. Finally, we will fund various efforts to improve the "fort-to-port" flow of personnel, equipment, and supplies in the United States.

Naval Strike Aircraft. The Navy is examining a number of innovative ways to improve the firepower aboard its aircraft carriers. First, the Navy will improve its strike potential by providing a precision ground-attack capability to many of its F-14 aircraft. It also will acquire stocks of new "brilliant" antiarmor weapons for delivery by attack aircraft. Finally, the Navy plans to develop the capability to fly additional squadrons of F/A-18s to forward-deployed aircraft carriers that would be the first to arrive in response to a regional contingency. These additional aircraft would increase the striking power of the carriers during the critical early stages of a conflict.

Army Firepower. The Army is developing new, smart submunitions that can be delivered by ATACMS, the Multiple-Launch Rocket System (MLRS), the Tri-Service Standoff Attack Missile (TSSAM) now under development, and by standard tube artillery. In addition, the Longbow fire control radar system will increase the effectiveness and survivability of the AH-64 Apache attack helicopter. We also are examining more prepositioning of ATACMS and MLRS and having Apaches self-deploy from their overseas bases so that all would be available in the early stages of a conflict.

Air Force Long-Range Bombers and Munitions. Air Force enhancements will be in two areas — bombers and munitions. First, we plan to modify the Air Force's B-1 and B-2 long-range heavy bombers to improve their ability to deliver "smart" conventional munitions against attacking enemy forces and fixed targets. Second, we will develop all-weather munitions. For example, the Air Force is developing a guidance package for a tactical munitions dispenser filled with antiarmor submunitions that could be used in all types of weather. These programs will dramatically increase our capacity to attack and destroy critical targets in the crucial opening days of a short-warning conflict.



Delivery of "smart" sensor-fused weapons on ground vehicles.

In addition, two other force enhancements are important to improving our ability to respond to the demanding requirement of two nearly simultaneous MRCs: improvements to reserve component forces and allied force capabilities.

Reserve Component Forces. We have undertaken several initiatives to improve the readiness and flexibility of Army National Guard combat units and other reserve component forces in order to make them

more readily available for MRCs and other tasks. For example, one important role for combat elements of the Army National Guard is to provide forces to supplement active divisions, should more ground combat power be needed to deter or fight a second MRC. In the future, Army National Guard combat units will be better trained, more capable, and more ready. If mobilized early during a conflict, brigade-sized units could provide extra security and flexibility if a second conflict arose while the first was still going on. In addition, the Navy plans to increase the capability and effectiveness of its Navy/Marine Corps reserve air wing through the introduction of a reserve/training aircraft carrier.

Allied Military Capabilities. We will continue to help our allies in key regions improve their defense capabilities. For example, we are assisting South Korea in its efforts to modernize its armed forces and take on greater responsibility for its own defense — including conclusion of an agreement to co-produce F-16 aircraft.

In Southwest Asia, we are continuing to improve our defense ties with friends and allies through defense cooperation agreements, more frequent joint and combined exercises, equipment prepositioning, frequent force deployments, and security assistance. We are also providing modern weapons, such as the M1A2 tank to Kuwait and the Patriot antimissile system to Kuwait and Saudi Arabia, to improve the self-defense capabilities of our friends and allies in the Gulf region.

Peace Enforcement and Intervention Operations

The second set of operations for which we must size and shape our forces involves a variety of contingencies that are less demanding than an MRC but still require significant combat forces and capabilities. Such operations may range from multilateral peace enforcement to unilateral intervention.

The types, numbers, and sophistication of weapons in the hands of potential adversaries in such operations can vary widely. For planning purposes, we assume that the threat we would face would include a mix of regular and irregular forces possessing mostly light weapons, supplemented by moderately sophisticated systems, such as antitank and antiship guided missiles, surface-to-air missiles, land and sea mines, T-54 and T-72-class tanks, armored personnel carriers, and towed artillery and mortars. Adversary forces might also possess a limited number of mostly older combat aircraft (e.g., MiG-21s, 23s), a few smaller surface ships (e.g., patrol craft), and perhaps a few submarines.

In most cases, U.S. involvement in peace enforcement operations would be as part of a multinational effort under the auspices of the United Nations or some other international body. U.S. and coalition forces would have several key objectives in a peace enforcement or intervention operation, each of which would require certain types of combat forces to achieve:

- Forced entry into defended airfields, ports, and other facilities and seizing and holding these facilities.

- Controlling the movement of troops and supplies across borders and within the target country, including enforcing a blockade or quarantine of maritime commerce.

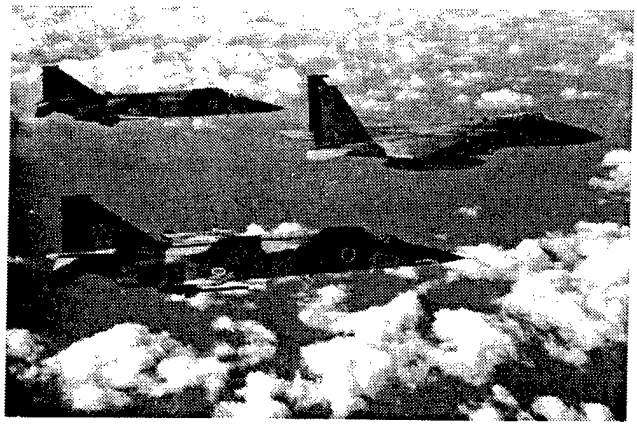
- Establishing and defending zones in which civilians are protected from external attacks.

- Securing protected zones from internal threats, such as snipers, terrorist attacks, or sabotage.

- Preparing to turn over responsibility for security to peacekeeping units and/or a reconstituted administrative authority.

The prudent level of forces that should be planned for a major intervention or peace enforcement operation is:

- 1 air assault or airborne division
- 1 light infantry division
- 1 mechanized infantry division
- 1 Marine Expeditionary Brigade
- 1 – 2 carrier battle groups
- 1 – 2 composite wings of Air Force aircraft



U.S. F–15 fighter leads two Japanese Self Defense fighters.

- Special operations forces
- Civil affairs units
- Airlift and sealift forces
- Combat support and service support units
- 50,000 total combat and support personnel.

These capabilities could be provided largely by the same collection of general purpose forces needed for MRCs, so long as the forces had the appropriate training needed for peacekeeping or peace enforcement. This means that the United States would have to forgo the option of conducting sizable peace enforcement or intervention operations at the same time it was fighting two MRCs.

Overseas Presence

The final set of requirements used to size general purpose forces are those related to sustaining the overseas presence of U.S. military forces. U.S. forces deployed abroad protect and advance our interests and perform a wide range of functions that contribute to our security.

The Bottom-Up Review reached a number of conclusions on the future size and shape of our overseas presence.

In **Europe**, we will continue to provide leadership in a reinvigorated North Atlantic Treaty Organization (NATO), which has been the bedrock of European security for over four decades. We plan to retain about 100,000 troops in Europe — a commitment that will allow the United States to continue to play a leading role in the NATO alliance and provide a robust capability for multinational training and crisis response. These forces will include about two and one-third wings of Air Force fighters and substantial elements of two Army divisions, along with a corps headquarters and other supporting elements. Equipment for bringing these in-place divisions to full strength will remain prepositioned in Europe, along with the equipment of one additional division that would deploy to the region in the event of a conflict.

U.S. Army forces will participate in two multinational corps with German forces. Their training will focus on missions involving rapid deployment to conflicts outside of central Europe and on "nontraditional" operations, such as peace enforcement, in addition to their long-standing mission of stabilization of central Europe. These missions might lead, over time, to changes in the equipment and configuration of Army units stationed in Europe. The Air Force will continue to provide unique theater intelligence, lift, and all-weather precision-strike capabilities critical to U.S. and NATO missions. In addition, U.S. naval ships and submarines will continue to patrol the Mediterranean Sea and other waters surrounding Europe.

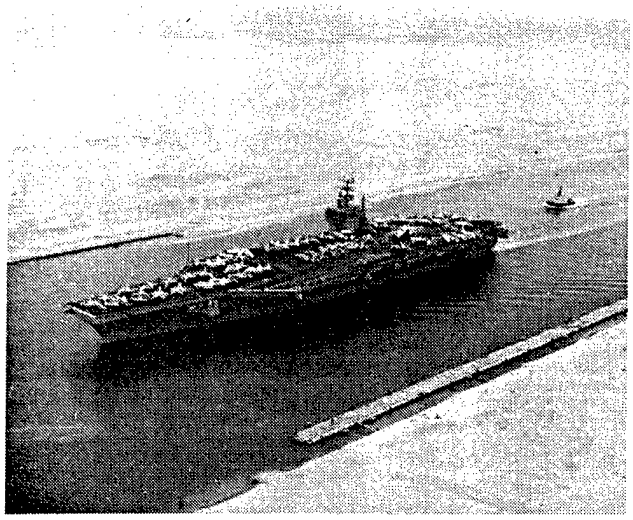
In **Northeast Asia,** we also plan to retain close to 100,000 troops. As recently announced by President Clinton, our commitment to South Korea's security remains undiminished, as demonstrated by the one U.S. Army division, consisting of two brigades, and one wing of U.S. Air Force combat aircraft we have stationed there. In light of the continuing threat of aggression from North Korea, we have frozen our troop levels in South Korea and are modernizing South Korean and American forces on the peninsula. We are also exploring the possibility of prepositioning more military equipment in South Korea to increase our crisis-response capability. While plans call for the eventual withdrawal of one of our two Army brigades from South Korea, President Clinton recently reiterated that our troops will stay in South Korea as long as its people want and need us there.

On Okinawa, we will continue to station a Marine Expeditionary Force and an Army special forces

battalion. In Japan, we have homeported the aircraft carrier *Independence*, the amphibious assault ship *Belleau Wood*, and their support ships. We will also retain approximately one and one-half wings of Air Force combat aircraft in Japan and Okinawa, and the Navy's Seventh Fleet will continue to routinely patrol the western Pacific.

In **Southwest Asia**, the absence of a large-scale U.S. military presence will continue to necessitate heavier reliance on periodic deployments of forces, rather than routine stationing of forces on the ground. The Navy's Middle East force of four to six ships, which has been continuously on patrol in the Persian Gulf since 1947, will remain. In addition, we plan to keep a brigade-sized set of equipment in Kuwait to be used by rotating deployments of U.S. forces that will train and exercise there with their Kuwaiti counterparts. We also are exploring options to preposition a second brigade set elsewhere on the Arabian peninsula.

These forces have been supplemented temporarily by several squadrons of land-based combat aircraft that have remained in the Gulf region since Operation Desert Storm and, along with other coalition aircraft, are now helping to enforce U.N. resolutions toward Iraq.



The aircraft carrier USS Dwight D. Eisenhower transiting the Suez Canal.

Another significant element of our military posture in Southwest Asia is the equipment prepositioned on ships that are normally anchored at Diego Garcia. In addition to a brigade-sized set of equipment for the Marine Corps, we have seven afloat prepositioning ships supporting Army, Air Force, and Navy forces.

In **Africa**, we will continue important formal and informal access agreements to key facilities and ports which allow our forces to transit or stop on the African continent. We will also deploy forces to Africa, as in recent operations like Sharp Edge (Liberia) and Restore Hope (Somalia), when our interests are threatened or our assistance is needed and requested. Today, more than 4,000 U.S. troops remain deployed in Somalia as part of the U.N. force seeking to provide humanitarian assistance to that country.

In **Latin America**, our armed forces will help to promote and expand recent trends toward democracy in many countries. They will also continue to work in concert with the armed forces of Latin American countries to combat drug traffickers. The United States will also retain a military presence in Panama, acting as Panama's partner in operating and defending the Panama Canal during the transition to full Panamanian control of the waterway in 1999.

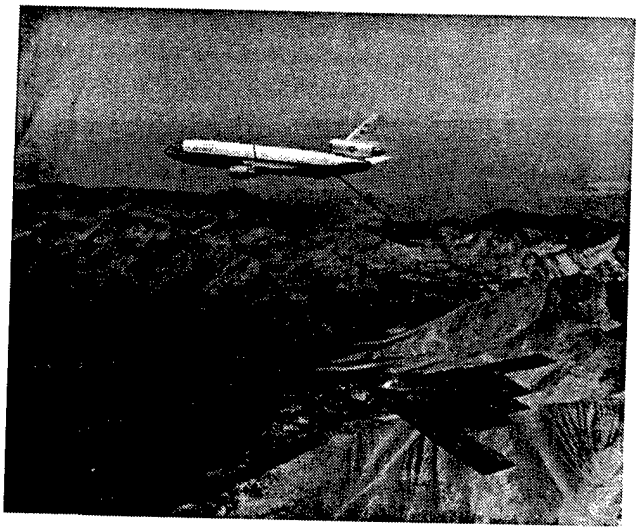
Naval Presence. Sizing our naval forces for two nearly simultaneous MRCs provides a fairly large and robust force structure that can easily support other, smaller regional operations. However, our overseas presence needs can impose requirements for naval forces, especially aircraft carriers, that exceed those needed to win two MRCs. The flexibility of our carriers, and their ability to operate effectively with relative independence from shore bases, makes them well suited to overseas presence operations, especially in areas such as the Persian Gulf, where our land-based military infrastructure is relatively underdeveloped. For these reasons, our force of aircraft carriers, amphibious ships, and other naval combatants is sized to reflect the exigencies of overseas presence, as well as the warfighting requirements of MRCs.

U.S. Navy and Marine forces continue to play important roles in our approach to overseas presence operations. In recent years, we have sought to deploy a sizable U.S. naval presence — generally, a carrier battle group accompanied by an amphibious ready group — more or less continuously in the waters off Southwest Asia, Northeast Asia, and Europe (most often, in the Mediterranean Sea). However, in order to avoid serious morale and retention problems that can arise when our forces are asked to remain deployed for excessively long periods in peacetime, we will experience some gaps in carrier presence in these areas in the future.

In order to avoid degradations to our regional security posture, we have identified a number of ways to fill gaps in carrier presence or to supplement our posture even when carriers are present. For example, in some circumstances, we may find it possible to center naval expeditionary forces around large-deck amphibious assault ships carrying AV-8B attack jets and Cobra attack helicopters, as well as a 2,000-man Marine Expeditionary Unit. Another force might consist of a Tomahawk sea-launched cruise-missile-equipped Aegis cruiser, a guided missile destroyer, attack submarines, and P-3 land-based maritime patrol aircraft.

In addition to these "maritime" approaches to sustaining overseas presence, a new concept is being developed that envisions using tailored joint forces to conduct overseas presence operations. These "Adaptive Joint Force Packages" could contain a mix of air, land, special operations, and maritime forces tailored to meet a theater commander's needs. These forces, plus designated backup units in the United States, would train jointly to provide the specific capabilities needed on station and on call during any particular period. Like maritime task forces, these joint force packages will also be capable of participating in combined military exercises with allied and friendly forces.

Together, these approaches will give us a variety of ways to manage our overseas presence profile, balancing carrier availability with the deployment of other types of units. Given this flexible approach to providing forces for overseas presence, we can meet the needs of our strategy with a fleet of eleven active aircraft carriers and one reserve/training carrier.



B-2 bombers being refueled by KC-10 tanker.

Nuclear Forces

The changing security environment presents significant uncertainties and challenges in planning our strategic nuclear force structure. In light of the dissolution of the Warsaw Pact, the breakup of the Soviet Union, the conclusion of the START I and II treaties, and our improving relationship with Russia, the threat of a massive nuclear attack on the United States is lower than at any time in many years.

However, a number of issues affecting our future strategic nuclear posture must still be addressed. Tens of thousands of nuclear weapons continue to be deployed on Russian territory and on the territory of three other former Soviet republics. Even under START II, Russia will retain a sizable residual nuclear arsenal. And, despite promising trends, the future political situation in Russia remains highly uncertain.

In addition, many obstacles must be overcome before the ratification of START II, foremost of which are Ukrainian ratification of START I and Ukraine's and Kazakhstan's accession to the Nuclear Nonproliferation Treaty as non-nuclear-weapon states —

a condition required by Russia prior to implementing START I. Moreover, even if these obstacles can be overcome, implementation of the reductions mandated in START I and II will not be completed for almost 10 years. Thus, while the United States has already removed more than 3,500 warheads from ballistic missile systems slated for elimination under START I (some 90 percent of the total required), in light of current uncertainties, we must take a measured approach to further reductions.

Two principal guidelines shape our future requirements for strategic nuclear forces: providing an effective deterrent while remaining within START I and II limits, and allowing for additional forces to be reconstituted in the event of a threatening reversal of events.

The Bottom-Up Review did not address nuclear force structure in detail. As a follow-up to the review, a comprehensive study of U.S. nuclear forces is being conducted. For planning purposes, we are evolving toward a future strategic nuclear force that by 2003 will include:

- 18 Trident submarines equipped with C-4 and D-5 missiles.

- 500 Minuteman III missiles, each carrying a single warhead.

- Up to 94 B-52H bombers equipped with air-launched cruise missiles and 20 B-2 bombers.

SECTION IV

BUILDING AN OVERALL FORCE STRUCTURE

Determining the overall force structure needed to provide the building blocks we have identified for new dangers and opportunities rests on the key question: How many of each type of building block might need to be engaged at once? The answer depends on the nature and number of dangers that threaten us at any given time. Figure 6 shows where and how we will need to engage building blocks as the international environment shifts from peacetime to multiple crises or conflicts and back to peace.

In peacetime, we will conduct routine overseas presence operations. Moreover, the nature of the new regional dangers and our recent experience suggests that we will also need building blocks for lower-scale operations such as peacekeeping and peace enforcement, as well as humanitarian assistance and disaster relief activities. Beyond these types of operations, we will routinely hold large forces in "strategic reserve."

Conflict Dynamics

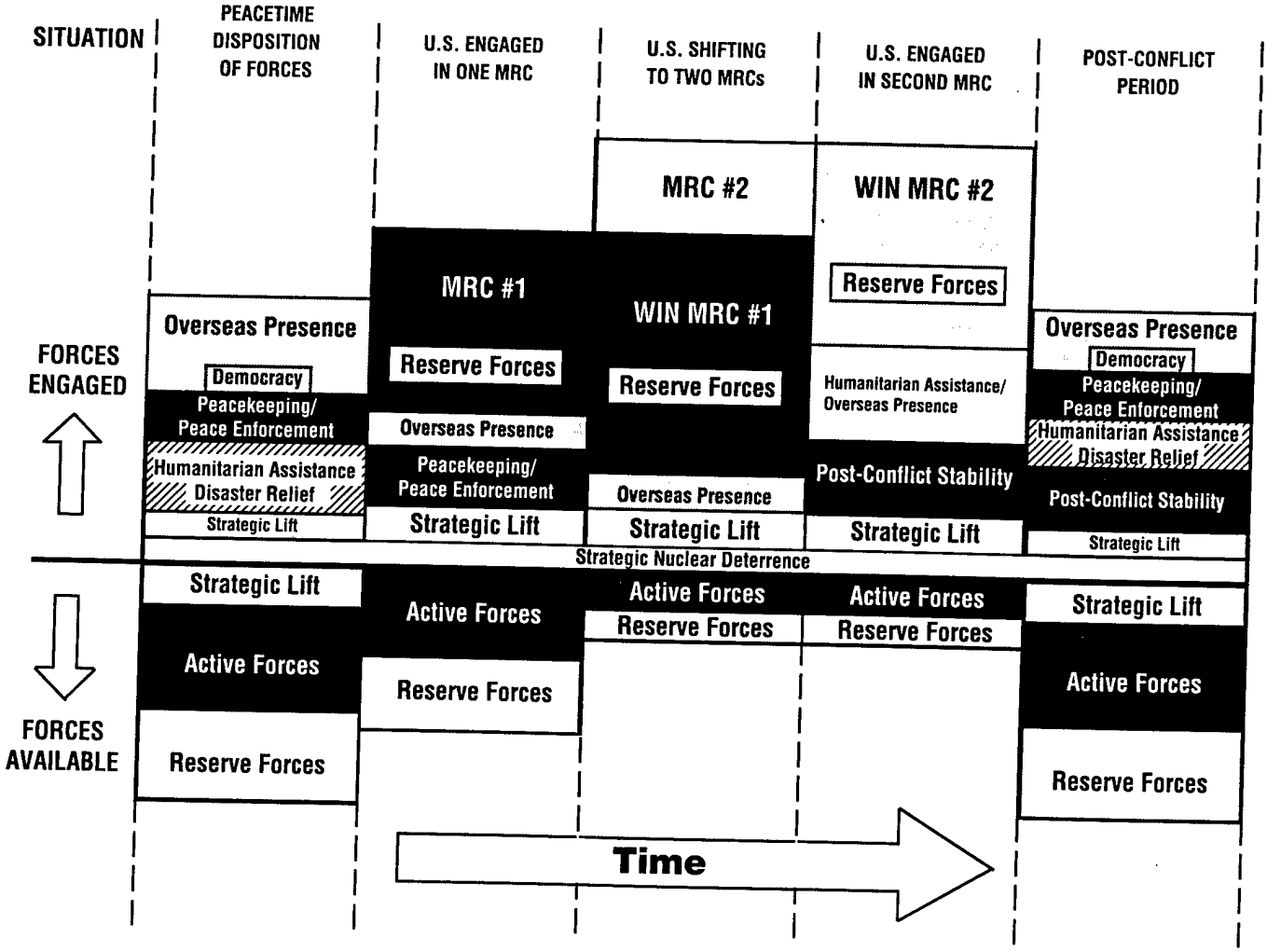


Figure 6

If a major regional conflict erupts, we will deploy a substantial portion of our forces stationed in the United States and draw on our overseas presence forces to put in place the capabilities needed to first halt and then defeat an aggressor. If we feel it is prudent to do so, we can keep other forces engaged in a smaller-scale operation like peacekeeping while responding to a single MRC.

If a second MRC breaks out shortly after the first, we will need to pull together and deploy another building block of forces to assist our allies in the threatened area in halting and defeating the second aggressor. The forces for that effort would come from a further reallocation of overseas presence forces, any forces still engaged in smaller-scale operations, and most of our remaining forces based in the United States. These forces would include a combination of air, ground, and maritime units deployed concurrently with those dispatched to the first MRC. Selected high-leverage and mobile intelligence, command and control, and air capabilities would be redeployed from the first MRC to the second as circumstances permitted. As will be described later, combat forces in the National Guard and reserves would play an important role in creating this building block.

As also shown in Figure 6, while the force building blocks would shift in order to provide the capability to fight two MRCs, there will continue to be a simultaneous requirement for forces and capabilities to maintain strategic nuclear deterrence, conduct overseas presence, peace enforcement, or other types of intervention operations, and provide a strategic reserve of mostly Guard and reserve forces back in the United States.

Once we had won both MRCs, our forces would assume a more routine, peacetime posture. However, as Figure 6 depicts, some forces would probably remain in the regions to maintain stability and to prevent any further problems from arising in the conflicts' aftermath.

Overall Force Structure

On the basis of a comprehensive assessment of U.S. defense needs, the Bottom-Up Review determined that the force structure shown in Figure 7, which will be reached by about the end of the decade, can carry out our strategy and meet our national security requirements.

U.S. Force Structure – 1999

Army	**10 divisions (active)** **5+ divisions (reserve)**
Navy	**11 aircraft carriers (active)** **1 aircraft carrier (reserve/training)** **45–55 attack submarines** **346 ships**
Air Force	**13 fighter wings (active)** **7 fighter wings (reserve)** **Up to 184 bombers (B-52H, B-1, B-2)**
Marine Corps	**3 Marine Expeditionary Forces** **174,000 personnel (active end-strength)** **42,000 personnel (reserve end-strength)**
Strategic Nuclear Forces (by 2003)	**18 ballistic missile submarines** **Up to 94 B-52H bombers** **20 B-2 bombers** **500 Minuteman III ICBMs (single warhead)**

Figure 7

This force structure will meet our requirements both for overseas presence in peacetime and for a wide range of smaller-scale operations. It will also give the United States the ability to prevail in the most stressing situation we may face — two major regional conflicts occurring nearly simultaneously.

In addition, the force structure provides sufficient capabilities for strategic deterrence and defense. It also provides enough forces, primarily reserve component, to be held in strategic reserve and utilized if and when needed. For example, reserve forces could deploy to one or both MRCs, if operations do not go as we had planned. Alternatively, they could be used to "backfill" for overseas presence forces redeployed to an MRC.

Within this overall force structure, each of the services will be making changes in order to support the defense strategy and provide the capabilities needed to win major regional conflicts quickly and decisively.

Army. Forward stationing of Army forces will be reduced, but greater use of prepositioning will improve the Army's ability to introduce heavy forces early in a conflict. Battlefield mobility and flexibility will be enhanced through helicopter and other selected modernization programs. Thus, although smaller, the Army will be more capable of delivering decisive combat power early to a distant region.

Navy. While cutting significantly the forces devoted to "blue water" sea control, the Navy is undertaking improvements and innovations in naval air and amphibious lift that will enhance its ability to bring power to bear in a land battle.

Air Force. The Air Force will also be reshaped to increase its ability to bring early firepower to regional battlefields. This will come through utilizing all of its assets — from long-range bombers to short-range strike aircraft — and enhancing their capabilities with improved munitions and the continued introduction of stealth technology. Airlift capabilities will also be modernized to ensure the rapid flow of personnel and equipment to distant regions when needed.

Marine Corps. Through prudent modernization, prepositioning, and a high level of training, the Marine Corps will capitalize on its ability to bring ready and well-supported combat capability to a battlefield quickly and effectively.

Analysis of Alternative Force Structures and Mixes

In the analysis supporting the Bottom-Up Review, four separate force structure options were investigated. The options were designed to meet successively more demanding regional defense strategies. Figure 8 illustrates the range of options considered. Option 3 — a force structure adequate to win two nearly simultaneous MRCs — represents, in broad terms, the approach we have chosen.

Option 1 would require the fewest resources, allowing us to reduce the defense budget and redirect excess funds to other national priorities. But, in providing only enough forces and capabilities to fight one major regional conflict at a time, this option would leave us vulnerable to the possibility that a potential aggressor might choose to take advantage of the situation if virtually all of our forces were already engaged in a conflict elsewhere. At a minimum, choosing this approach would require us to scale back or terminate certain existing mutual defense treaties and long-standing commitments, with a corresponding reduction in our influence in those regions where we chose to abandon a major leadership role.

Option 2 frees additional resources for other national priorities, but is premised on the risky assumption that, if we are challenged in one region, respond to the aggression, and then are challenged shortly afterwards in another region, a sizable block of our remaining forces will have the stamina and capability to defeat the first adversary, move to another region possibly several thousand miles distant, and defeat a second adversary. Choosing this option might provide sufficient military strength in peacetime to maintain America's global leadership, but it would heighten the risk in wartime associated with carrying out a two-MRC strategy.

Force Options for Major Regional Conflicts

STRATEGY	1 Win One MRC	2 Win One MRC with Hold in Second	3 Win Two Nearly Simultaneous MRCs	4 Win Two Nearly Simultaneous MRCs Plus Conduct Smaller Operation
Army	• 8 Active Divisions • 6 Reserve Division Equivalents	• 10 Active Divisions • 6 Reserve Division Equivalents	• 10 Active Divisions • 15 Reserve Enhanced-Readiness Brigades	• 12 Active Divisions • 8 Reserve Enhanced Equivalents
Navy	• 8 Carrier Battle Groups	• 10 Carrier Battle Groups	• 11 Carrier Battle Groups • 1 Reserve Carrier	• 12 Carrier Battle Groups
Marine Corps	• 5 Active Brigades • 1 Reserve Division	• 5 Active Brigades • 1 Reserve Division	• 5 Active Brigades • 1 Reserve Division	• 5 Active Brigades • 1 Reserve Division
Air Force	• 10 Active Fighter Wings • 6 Reserve Fighter Wings	• 13 Active Fighter Wings • 7 Reserve Fighter Wings	• 13 Active Fighter Wings • 7 Reserve Fighter Wings	• 14 Active Fighter Wings • 10 Reserve Fighter Wings
			Force Enhancements	

Figure 8

Option 3 provides sufficiently capable and flexible military forces to position the United States to be a leader and shaper of global affairs for positive change. It allows us to carry forward with confidence our strategy of being able to fight and win two major regional conflicts nearly simultaneously. However, it leaves little other active force structure to provide other overseas presence or to conduct peacekeeping or other lower-intensity operations if we had to fight two MRCs at once. If such tasks became necessary, or if either MRC did not evolve as we anticipated, then we might be required to activate significant numbers of reserve component forces. Also key to the Option 3 force's ability to carry out its strategy are a series of critical force enhancements described in Section III, including additional prepositioning of brigade sets of equipment, increased stocks of antiarmor precision-guided munitions, more early-arriving naval air power, and other initiatives.

Option 4 would allow us to fight and win two MRCs nearly simultaneously while continuing to sustain some other overseas presence and perhaps an additional peacekeeping, peace enforcement, or other intervention-type operation. However, to maintain forces of this size would require significant additional resources, thereby eliminating any "peace dividend" the American people are expecting as a result of the end of the Cold War. Yet our analysis showed that, despite this larger investment, Option 4 would provide only a small increment of increased military capability.

Assessment of Alternative Force Mixes

Each of the four strategy and force structure options was tested by "weighting" the various mixes in favor of land, sea, or air contributions. The analysis indicated that, in some circumstances, placing emphasis on certain types of forces or capabilities could help offset the loss of certain other capabilities or forces. For example, additional ground forces might be able to compensate for the loss of some air contributions when dealing with guerrilla or insurgency threats where terrain is thick and constrained, or where the enemy is not technologically advanced. Alternatively, the substitution of air power for some ground forces might be supportable in cases where terrain is open, the enemy is highly dependent on key industries, resources, or utilities, or heavy armored forces are engaged in some other conventional conflict. Even among air components, certain environments or circumstances favor the use of land-based versus sea-based air forces or vice versa.

Nevertheless, while the analysis indicated that a force structure geared toward particular types of forces might enhance overall capabilities under very specific conditions, it would also create serious vulnerabilities under other circumstances. Given the great uncertainty as to where, when, and how future crises might occur, anything but a carefully balanced force will risk ineffectiveness, high casualties, or a failure to meet objectives. The basic conclusion of the analysis was that the balanced force structure we have selected is the best choice to execute our defense strategy and maintain the flexibility needed to deal with the wide range of dangers we may face.

SECTION V: MODERNIZATION

INTRODUCTION

Along with developing a strategy to address new dangers and seize new opportunities, and planning capable and ready forces to carry out that strategy, we must also ensure that America's armed forces remain the best equipped in the world. Thus, as part of the Bottom-Up Review, we conducted a comprehensive evaluation of key modernization programs within the Department of Defense. Throughout the process, a number of considerations helped shape our assessment of future modernization needs and guided our decisions on weapon system acquisitions.

Of foremost concern was operational need. We began with an assessment of the strategies to be carried out by U.S. combatant commanders in the future, evolving threats to which those strategies must respond, and promising approaches to addressing those threats. In the past, our weapons were designed almost exclusively to counter Soviet systems. In the post-Cold War era, our weaponry and equipment must be able to deal with myriad potential threats and with weapon systems of various origin. Moreover, we must be prepared to employ our military systems in a wide range of physical environments and operational settings. Improved interoperability with the forces of other countries is also a high priority.

Second, our evaluation was guided by the prospects for a variety of new technologies to provide substantial enhancements to the capabilities of U.S. weapon systems — those that are already operational as well as those in development. The review took into account the potential contributions of enhanced support systems (such as surveillance and communications assets), advanced munitions, and new major systems, seeking to identify those that could provide the greatest "value added" under a constrained budget.

The technological revolution now taking place has a number of implications for the design and upgrade of military systems:

- In order to take best advantage of technological advances, the entire weapons procurement cycle must be shortened, so that weapon systems fielded today are not dependent on the technology of a decade ago.

- The revolution in weapons technology also suggests that we must reexamine our concepts for employing certain weapons — tanks, aircraft, missiles, and the like — on the battlefield. Advances in information technology, materials, and electronics, if properly incorporated into weapons, hold promise of providing significant advantages for U.S. forces against potential adversaries.

A third important consideration in our modernization review was the changing nuclear threat and its implications for future U.S. defense strategy. Because of the transformation in the relationship between the United States and Russia, as exemplified by the dramatic nuclear reductions called for in the START I and START II treaties, we do not have to invest as many resources in nuclear deterrence as was the case at the height of the Cold War. At the same time, the proliferation of weapons of mass destruction presents a new challenge to U.S. security that must be taken into account and guide our research and development efforts in the coming years.

Finally, ensuring the long-term viability of critical elements of the defense industrial base played a significant role in our deliberations. The defense industrial base will shrink substantially as a result of the reductions in defense spending that have been occurring and are projected for the future. However, it is important that this adjustment be accomplished carefully, with an eye toward preserving those parts of the industrial base that are essential to our long-term defense needs and that would be difficult or costly to reconstitute once lost.

The modernization review focused on major programs that involve the potential for significant investment. These programs include:

- Theater air forces
- Attack and reconnaissance helicopters
- Ballistic missile defense
- Aircraft carriers
- Attack submarines
- Space launch
- Military satellite communications
- V-22 Osprey tilt-rotor aircraft

Summaries of our findings in each of these areas are presented in the remainder of this section.

SECTION V: MODERNIZATION

THEATER AIR FORCES

Theater air forces provide the United States the ability to project military power rapidly and effectively in defense of vital interests. In times of crisis, the prompt availability of these forces helps to deter aggression and protect U.S. and allied interests. If conflicts arise, U.S. air power provides a versatile, fast, and lethal means of countering hostile forces and neutralizing enemy threats in the air, at sea, and on the ground. We saw this vividly demonstrated in Operation Desert Storm.

By virtue of their rapid responsiveness and operational flexibility, theater air forces are well suited to the demands of the new defense strategy. As the focus of planning shifts from global war to regional conflicts, as our overseas presence declines, and as our forces grow smaller, we recognize that theater air forces will undoubtedly play an even greater role in any future conflict in which the United States is engaged. The effectiveness of air operations in the Persian Gulf War underscores the necessity of funding theater air modernization at a level sufficient to maintain our technological edge and our domination of the skies.

The Problem

A number of combat aircraft that were key to our success in Operation Desert Storm and have been the core of our aviation structure for many years are aging and must be replaced. For example, by 1995, the average age of the Navy's inventory of A-6 Intruder medium-attack aircraft will be more than 20 years — the age at which such aircraft have typically been retired — and some will be even older. Other airframes, including the F-15C/D Eagle, F-16A/B Fighting Falcon, and F-14A/D Tomcat, will need to be retired beginning early in the 21st century.

Replacing these airframes is a complex and expensive undertaking involving difficult trade-offs. The selection of replacement aircraft is complicated by several factors and questions that were considered as theater air modernization requirements were evaluated for the Bottom-Up Review.

First, new aircraft that incorporate important advances in low observability ("stealth"), advanced avionics, greater range and speed, and improved munitions are quite expensive, with the cost per aircraft averaging 30 to 50 percent more than that of current-generation systems. Thus, we must determine how many of what types of these new aircraft are affordable, and what level of technology they should incorporate.

Second, during the Cold War, we sized and shaped our theater air forces to meet the formidable threat of a global conflict with the Soviet Union. With the dissolution of the Warsaw Pact and the Soviet Union, we can reduce the overall size of our combat air structure while selectively modernizing it in order to maintain its superiority over any potential aggressor. In determining how many of what types of new aircraft are needed, we had to carefully assess the projected threats that our aircraft are likely to face in this new, post Cold-War world, both from advanced aircraft and from modern air defenses.

Third, certain modernization requirements are more pressing than others. As mentioned earlier, the A-6 is the airframe in greatest need of early replacement. Our general approach on theater air modernization was to make only those programmatic decisions that needed to be made now in order to correct current deficiencies, while protecting our flexibility in choosing modernization options in the future.

Fourth, while there is only one U.S. Air Force, both the Navy and Marine Corps have sizable tactical aviation elements that include different types of advanced, fixed-wing combat aircraft. Historically, the Air Force and the Navy have developed new combat aircraft separately and individually — efforts at joint development of a single aircraft type to meet the requirements of both services have met with very limited success.

Nevertheless, our review analyzed the potential for substantial cost savings through joint Air Force-Navy development of single aircraft types and components to meet the requirements of both services.

Fifth was the issue of the defense industrial base. With the drawdown in our defense structure comes a reduced need for aircraft production capacity. Currently, nearly all aircraft prime contractors are operating at approximately 50 percent of capacity, and that figure is projected to decline to 40 percent by the year 2000. In looking at modernization options, we had to consider how best to preserve needed aircraft design and production capacity and competitiveness, while allowing the defense companies that remain to transition smoothly to reduced requirements.

Sixth, as we reduce our overall forces and defense funding levels we will not be able to afford several types of special-purpose aircraft. Multirole aircraft capable of air superiority, strike, and possibly support missions have a high "payoff."

While taking account of these issues, we also had to address such related factors as the proper allocation of roles, missions, and functions among the services. For example, the Bottom-Up Review considered how Marine Corps aviation could best be modernized, and how it might be better integrated with the Navy's carrier battle groups. A second "roles and missions" issue was whether naval aviation should continue to stress the capability to strike so-called "deep interdiction" targets – a requirement for which the A-6 and its successor, the A/F-X, are both specifically designed.

The Threat

With the demise of the Soviet Union and the Warsaw Pact, the threats that U.S. combat aircraft will face over the next decade are likely to be less intense than was the case during the Cold War. However, the countries of the former Soviet Union, especially Russia and Ukraine, as well as France and other Western states continue to field sophisticated fighter aircraft and ground-based air defense systems, including high-performance surface-to-air missiles, that in many ways match and possibly exceed the capabilities of our own currently fielded systems. More important, these countries are aggressively selling their most advanced weapons in the international market, which increases the potential for countries hostile to our interests acquiring far more capable aircraft and air defense systems.

Moreover, Russia, France, and other countries are carrying out sophisticated development programs for aircraft, air-to-air missiles, and surface-to-air missiles with dramatically improved lethality. These systems are likely to be sold internationally over the next decade.

Current Theater Air Programs

Currently, there are a number of theater air modernization programs underway and in various stages of development.

- The F-22 is being developed by the Air Force as its air-superiority fighter for the future. The designated replacement for the F-15 C/D, the F-22 is currently well into engineering development, with procurement scheduled to begin in 1997. The aircraft is slated to enter operation in 2003.

- The F/A-18 E/F aircraft is a derivative of the current multimission, carrier-capable F/A-18 A/B/C/D models. It is considered a relatively low-risk development program that will provide a more advanced fighter and attack capability, including greater payload and range, as well as improved survivability because of enhanced low-observable features. The F/A-18 E/F is to replace some F/A-18s, F-14s, and A-6s beginning in 2001.

- The A/F-X Advanced Strike Aircraft is a multirole, carrier-capable aircraft being developed jointly by the Navy and the Air Force to replace the Navy's A-6 and F-14 fleets and the Air Force's F-111, F-15E, and F-117 aircraft. The A/F-X incorporates stealth technology, along with advanced avionics, countermeasures, and other performance improvements. The aircraft is still in the early developmental stage (concept definition is complete but a specific design

Navy F/A-18 aircraft landing on an aircraft carrier.

has not yet been selected), with initial deployment planned for 2008.

• The Multirole Fighter (MRF) is envisioned as a relatively low-cost but stealthy replacement for the Air Force's F-16 multirole aircraft, and perhaps for Navy and Marine Corps F/A-18 aircraft, beginning in 2015.

The dilemma we faced as we began the Bottom-Up Review was a recognition that, given the tremendous costs entailed in buying these aircraft, proceeding with all of them as planned would absorb a significant percentage of our overall research and development and procurement funding both in the near term and beyond.

The total cost for all four programs has been estimated to be almost $320 billion in FY 1994 dollars. Much of this funding would be required in the years beyond the 1994-99 Future Years Defense Program (FYDP) — the so-called "bow wave" effect — meaning that decisions taken now on aircraft modernization will affect how we spend scarce procurement dollars for years to come. Even within the FYDP period, costs would be significant, totaling over $33 billion. Thus, to pursue all of these programs simultaneously would have meant deferring or canceling other vital weapons modernization programs over the next decade. We needed to examine alternatives.

Options Examined

Several alternative strategies for modernizing our theater air forces were considered. The options were evaluated in terms of their costs and capabilities, responsiveness to operational requirements, and other parameters.

The various modernization options were assessed against postulated threats during three different time periods (2003, 2013, 2023) in a large-scale theater air campaign. The results indicated that options of similar cost produced relatively equal levels of effectiveness, with no single option standing out as the most cost-effective. This led to the conclusion that no single modernization option identifiable at this time could best meet our anticipated theater air requirements for the next thirty years.

Accordingly, we elected to take a different approach – making only the theater air decisions that need to be made today and preserving maximum flexibility for future program choices.

The Decision

The incremental approach we have adopted makes the decisions that must be made now: (1) replacing the Navy's aging A-6 ground attack aircraft, and (2) proceeding with the F-22 to ensure technology dominance. In summary:

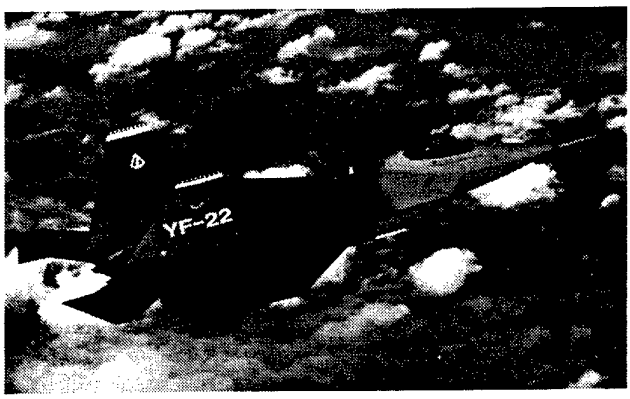
• We will proceed with development and procurement of the F/A-18 E/F to achieve initial operational capability in 2001. Once production of the E/F version has begun in 1997, production of the F/A-18 C/D model will be terminated.

• We will retire all A-6 aircraft by 1998. To help compensate for the A-6's retirement, we will upgrade the F-14 with a limited ground-attack capability.

• We will also proceed with development and procurement of the F-22, looking toward an initial operational capability by 2003. The F-22's

quantum improvements in stealth, "supercruise" capability, and avionics will make it the best air-superiority fighter in the world for the foreseeable future. We will also incorporate a precision ground-attack capability into the F-22 at the very outset of production, thus providing a multirole capability that greatly improves the aircraft's utility and cost-effectiveness.

- We will cancel the A/F-X and the MRF. We also plan to terminate all production of the F-16 after FY 1994. These actions will save significant funds both over the FYDP period and in future years.



Developmental version of Air Force's F–22 aircraft.

Additionally, we will launch a Joint Advanced Strike Technology Program that focuses on developing common components for future engines, avionics, ground support, training, munitions, and advanced mission planning. The technologies pursued under this program could be used with any future combat aircraft the nation decides to build. These common technologies account for the bulk of the cost incurred in acquiring and operating aircraft. Different airframes — the chief differentiator between land-based and carrier-based aircraft — are a lesser part of overall aircraft costs. Thus, we are aiming for a combat aircraft that, in terms of cost, is 80 percent "joint," although there may be different airframe silhouettes. We believe this will significantly reduce development and production costs for the next generation of Navy and Air Force aircraft, even if we elect to proceed with different airframes.

The Joint Advanced Strike Technology program will develop several technology demonstrator aircraft to explore different technologies that could be incorporated into future aircraft. From these technology demonstrators, prototype aircraft would then be developed to help choose the next-generation replacement for the A-6, F-14, F-16, and F-111 as they reach the end of their service lives.

We will also strengthen supporting capabilities. First, this involves a joint munitions program to ensure that high-leverage, highly accurate weapons (such as the Joint Standoff Weapon and Joint Direct Attack Munition) are available to destroy targets with minimum collateral damage. Second, we will improve our targeting capabilities so that we can better utilize these weapons. Third, we will improve the conventional bombing capabilities of our long-range B-1, B-2, and B-52 bombers.

Our program will also protect the industrial base necessary to meet projected theater air modernization needs. Production of both the F/A-18 E/F and the F-22 at modest annual rates will allow us to preserve aircraft production lines for other future needs. Development of these aircraft, as well as our joint advanced technology program, will allow us to maintain critical aircraft design teams.

This approach to theater air modernization — proceeding with the F/A-18 E/F and F-22, and with a robust technology development and demonstration effort to lay the foundation for future aircraft selection — provides a sound combination of programs that responds to foreseeable mission requirements, affordability concerns, a new threat environment, and priorities for replacement, while simultaneously preparing for future operational needs.

SECTION V: MODERNIZATION

ATTACK AND RECONNAISSANCE HELICOPTERS

The Army has two main types of armed helicopters: attack and reconnaissance. Attack helicopters engage and destroy armored vehicles and other enemy targets. Reconnaissance (or "scout") helicopters perform intelligence-gathering, surveillance, and target acquisition and designation missions.

Army combat helicopters contribute in important ways to the new post-Cold War defense strategy. In times of crisis, they can either self-deploy or be airlifted to distant areas, arriving in significantly less time than ground forces. Moreover, they provide substantial combat power relative to the amount of air transport required to deploy them. With their ability to adapt and perform multiple roles on the modern battlefield, combat helicopters are key contributors to the Army's ability to conduct the fast-paced, maneuver-type warfare that we expect to dominate future conflicts.

The Army currently has about 3,300 combat helicopters of five different types: the OH-6 and OH-58A/C Kiowa, which are reconnaissance helicopters; the AH-1 Cobra and OH-58D Kiowa Warrior, which perform armed reconnaissance and attack missions in support of light forces; and the AH-64A Apache, an attack helicopter. Under the Aviation Redesign Initiative, the Army is reducing the size of its helicopter fleet as part of its overall force reduction, while modernizing the helicopter forces that remain.

The Problem

The majority of OH-58 A/Cs and AH-1s have met or exceeded their expected service life of 20 years and are in need of replacement. The OH-58D and AH-64 are newer, but have not been produced in the quantities or with the capabilities needed to meet all of the Army's attack and reconnaissance requirements.

In addition, recent joint exercises and operations, including Operation Desert Storm, have identified a number of operational shortfalls in the armed reconnaissance/light attack helicopter fleet. These include limited night and adverse weather capability; inadequate reliability, maintainability, and supportability; insufficient survivability; inability to destroy the full range of ground targets; limited shipboard compatibility; limited air-to-air combat capability; and other deficiencies.

Army Aviation Modernization Plan

During the previous administration, the Army developed a modernization plan for attack and reconnaissance helicopters that included three main components:

- Modifying existing AH-64As to the AH-64 C/D Longbow configuration. The mast-mounted Longbow fire control radar enhances the survivability and targeting capability of attack helicopters. It allows them to fire rapidly on large numbers of air or ground targets, even in adverse weather, when used in conjunction with an advanced Hellfire missile. After firing the current laser-guided Hellfire, a helicopter must remain in the vicinity of the target in order to guide the missile while it is in flight; this exposes the helicopter to enemy fire. The Longbow Hellfire uses a new "fire and forget" guidance system that does not require a designator, thus improving helicopter survivability. Approximately 227 Apaches would be modified to the "D" version and another 529 would become AH-64 Cs. The D models would receive Longbow radars, new improved engines, and other enhancements. The AH-64 Cs would receive modifications enabling them to carry and fire Longbow Hellfire missiles, but they would not actually be outfitted with the new fire control radar.

- Procuring the RAH-66 Comanche helicopter for the armed reconnaissance mission or attack mission in support of light forces. The plan was to buy approximately 1,300 Comanches, of which about one-third would be equipped with a downsized Longbow

system. The Comanche is a state-of-the-art helicopter that provides better self-deployability, greater night and adverse weather capability, improved lethality and air combat capability, higher survivability and reliability, and lower operating and support costs.

• Purchasing additional OH-58D helicopters until the Comanche is introduced. To fill the near-term gap in production until the Comanche is deployed, approximately 350 OH-58D Kiowa Warriors would be purchased and fielded as interim armed reconnaissance/light attack helicopters. This element of the Army's plan has, in fact, already been mostly funded, with production scheduled to be completed in FY 1995.

The Threat

The primary threats to attack and reconnaissance helicopters are surface-to-air missiles and antiaircraft artillery. These weapons are relatively inexpensive, often simple to operate, and are found in very large numbers worldwide. Other attack helicopters armed with air-to-air missiles and cannons could also pose a threat.

In the past, our helicopter forces were designed primarily to counter Soviet air defenses and combat aircraft. In the post-Cold War era, our principal concern in considering attack and reconnaissance helicopter requirements is the air defenses, combat aircraft, and missiles projected to be deployed by regional powers we might have to face. In assessing the utility of the Longbow system on the AH-64D and RAH-66, we also need to consider existing and projected future techniques of concealment and countermeasures that could reduce Longbow's effectiveness.

AH-64 Apache helicopter with Longbow radar.

As with other types of weapons, the demise of the Soviet Union and the need for hard currency by the former Soviet republics has meant that Soviet weapons, including advanced air defense systems and combat helicopters, are being exported in significant number. Other European countries are also manufacturing and marketing such systems. As these weapons proliferate, the threat emerging in some regions, particularly the Middle East, could approach that previously found only in Europe, although inventory levels and the capability to integrate air defenses could be a limiting factor. This prospect makes the survivability, lethality, and other enhancements of the RAH-66 and AH-64D Longbow a priority.

Options Examined

Three options for modernizing the attack and reconnaissance helicopter force were examined:

• **Option 1** would maintain the previously planned modernization program, procuring and fielding both the AH-64 C/D with Longbow and the RAH-66 Comanche. One-third of the RAH-66 fleet would be fielded with the Longbow fire control radar. The Army's AH-1 and OH-58 A/C and D helicopters would be phased out as the new systems became operational.

• **Option 2** would terminate the RAH-66 program but retain the AH-64 C/D. The AH-64 modification program would be the same as under Option 1, except that additional AH-64s would be purchased to perform the heavy attack mission. Additional OH-58D aircraft would be procured to perform the light attack/armed reconnaissance mission. This option also phases out the Army's AH-1s and OH-58 A/Cs.

• **Option 3** would terminate the AH-64 C/D modification program and procure and field the RAH-66 without the Longbow radar. The Longbow radar

would be returned to a technology base program until the technology has further matured. No Longbow-capable Hellfire missiles would be procured. The AH-1 and OH-58 A/C and D would be phased out.

A fourth option that would have terminated both the AH-64 C/D and the RAH-66 was considered in the initial stages of the review. That option was rejected because it did not meet the combat helicopter requirements of the new defense strategy.

Marine Corps attack/reconnaissance helicopters were excluded from the review. The Marine Corps does not employ armed reconnaissance helicopters, and the AH-1W is its only attack helicopter. The AH-1W is a shipboard-compatible system currently produced at the rate of 12 per year. Altering this program by the introduction of an additional type of helicopter or replacing the AH-1W in the near term would not offer any cost savings or increase the effectiveness of Marine Corps attack helicopters. However, the Bottom-Up Review did look at replacing the Army's Comanche helicopter with the AH-1W and determined that it was not the best option.

Evaluation of Options

The options were evaluated according to four criteria: (1) combat effectiveness; (2) technical risk; (3) acquisition and life-cycle cost; (4) and effects on the defense industrial base.

RAH-66 Comanche helicopter.

Much of the analysis was derived from previous studies. Those earlier studies had looked at a range of scenarios and threat levels, involving company through corps-level missions, and they included evaluations of the lethality, survivability, sustainability, and deployability of alternative helicopter forces.

A group of outside experts was asked to evaluate the analysis conducted for the Bottom-Up Review. The group concluded that there was some technical risk associated with Longbow's development. One such risk was the radar's inability to recognize and identify, as well as detect and classify, stationary ground targets at the longer ranges from which it could enable missiles to be fired. This poses a potential "identification of friend and foe" problem. But the group concluded that the risk was manageable, and that the advantages of the system, even if this full capability cannot be obtained, make it a very cost-effective force enhancement.

The cost analysis led to the conclusion that modernization is not the major contributor to the total cost of any option. Longbow adds approximately 10 percent to the life-cycle cost of Options 1 and 3, and the Comanche constitutes about one-third of the cost of Option 1. Overall, Option 3 is the lowest-cost near-term option, but it saves little over the long term. Option 2 saves little during the FYDP period, but it does reduce long-term costs significantly.

The industrial base assessment concluded that the modernization options could all be executed with the current helicopter industrial base, which has considerable excess design, engineering, and production capacity. Option 3 would probably lead to the loss of one prime contractor, but it would increase the utilization of the other three major helicopter manufacturers. If both the RAH-66 and V-22 were developed and fielded, the United States would probably retain its more than 50 percent share of the world's civil and military helicopter market. Without these programs, that figure would drop to 40 percent.

Option 1. The previously planned program provides significant improvements in both lethality and survivability and solves many of the current deficiencies in night and adverse weather capability. It provides a balanced, deployable, and sustainable fleet. But it also is the most costly of the three options at any of the force levels considered.

Option 2. By terminating the RAH-66 program, this option emphasizes near-term improvements in the attack helicopter inventory but leaves major deficiencies in armed reconnaissance capabilities. The technical risks associated with the Longbow program remain. Option 2 is the least costly of the three alternatives over the program lifetime, but it costs more in the near term because of the investment in OH-58Ds and improved AH-64s.

Option 3. By terminating Longbow but proceeding with the RAH-66, this option makes long-term improvements in scout and armed reconnaissance capability, but only modest upgrades to attack capability. Although it is the lowest-cost near-term alternative, Option 3 offers the least improvement in antiarmor capability while abandoning Longbow's potentially high cost-effectiveness if deployed on both the AH-64 and RAH-66.

The Decision

We have decided to proceed with Option 1 — fielding both the RAH-66 Comanche and AH-64 C/D with Longbow — for a variety of reasons. First, the cost during both the FYDP period and beyond is not a significant discriminator, given the improvements in capability both systems provide.

Second, proceeding with both Apache (Longbow) and Comanche yields capabilities that are complementary and not directly substitutable for one another. The RAH-66 provides significant improvements in all mission areas and alleviates age and operational shortfalls in the reconnaissance/scout fleet. It also brings technical advances in stealth and avionics. Although the value of reconnaissance is difficult to measure, our experience in the Persian Gulf War and other recent operations has shown that the battlefield information that reconnaissance helicopters provide is becoming increasingly important in modern warfare. Longbow will enhance the survivability, lethality, and target detection capability of both armed reconnaissance and attack helicopters. While it will require a significant investment in the near term, this expenditure will yield real dividends in the longer term. However, the technical and cost-growth risks associated with both Longbow and Comanche will need to be monitored and carefully managed, since both systems are on the cutting edge of technology and have significant development time remaining.

SECTION V: MODERNIZATION

BALLISTIC MISSILE DEFENSE

Throughout the Cold War, both the United States and the Soviet Union conducted research and development on ways to defend against nuclear-armed ballistic missiles. With the signing of the Anti-Ballistic Missile (ABM) Treaty in 1972 banning nationwide ABM systems, the issue of ballistic missile defense (BMD) was relegated to a less prominent status. Beginning in March 1983, ballistic missile defense gained new prominence with the unveiling of the Strategic Defense Initiative (SDI). Throughout the next decade, the SDI program engendered significant debate with regard to its viability and cost.

The Problem

Despite a decade of research and an investment of $30 billion, most experts inside and outside the Department of Defense agree that we are far from deploying a highly effective defense against a large-scale missile attack. Furthermore, as a result of the strategic arms reduction agreements recently negotiated with the former Soviet Union and the dissolution of that country, the principal threat against which such a system was originally designed has drastically declined.

In response to these developments, and because the Congress had consistently failed to fund the scale of SDI program that the executive branch proposed, the Bush Administration refocused SDI toward a more limited defense of the United States and its allies, called Global Protection Against Limited Strikes (GPALS). The Bush program called for spending an additional $39 billion for ballistic missile defense in FY 1995-99 — an amount that would have constituted a significant portion of the modernization dollars in the DoD budget.

In his FY 1994 defense budget request, President Clinton decided to scale back investments in missile defenses from $6.3 billion under the Bush plan to $3.8 billion. This reduction reflected this Administration's skepticism about the need for early deployment of a national missile defense and a desire both to reorient the program toward theater missile defense and to fund overall missile defense research and development at a sustainable level.[1]

The Bottom-Up Review thus examined U.S. missile defense requirements from a perspective of identifying options that could meet future needs at an affordable cost.

The Threat

There are three general categories of long-range missile threats to the United States: deliberate attacks by the former Soviet Union or China, accidental or unauthorized launches from those countries, and the emergence of new long-range missile threats from potentially hostile nations.

If Ukraine, Belarus, and Kazakhstan ratify and implement START I and join the Nuclear Nonproliferation Treaty as nonnuclear states, Russia will be the only country of the former Soviet Union possessing missiles capable of reaching the United States. Once START II is implemented, Russian strategic nuclear forces will be much smaller than they are today and strategic modernization is expected to proceed at a slower pace. While China also has a few nuclear missiles that could reach the United States, its strategic nuclear force is quite small now, and it is likely to grow slowly in both size and capability over the next decade. A deliberate attack by Russia or China on the United States would appear to be highly unlikely.

Accidental or unauthorized launches of Chinese or former Soviet nuclear missiles are also considered

[1] The term *theater missile defense* (TMD) refers to defenses against shorter-range theater and tactical missiles that might be used against forward-deployed U.S. forces or U.S. allies. A *national missile defense* (NMD), by contrast, would defend against long-range strategic missiles that might be used to attack the United States directly.

unlikely. Both countries appear to maintain effective nuclear weapon control procedures to preclude such an event.

Finally, while no other potentially hostile nation currently possesses the capability to threaten the United States with ballistic missiles (and probably none will acquire such a capability for the next several years), the possibility of a limited ballistic missile threat from the Third World sometime in the first decade of the next century cannot be excluded.

However, a different threat of particular concern in the post-Cold War period is the proliferation of shorter-range ballistic and cruise missiles armed with nuclear, biological, or chemical warheads. Ballistic and cruise missile deployments are expected to increase worldwide, despite stepped-up efforts to inhibit their proliferation, and several countries other than the acknowledged nuclear states are developing both nuclear weapons and ballistic missiles. Similarly, a number of countries have or are developing chemical or biological weapons that could be delivered by ballistic or cruise missiles.

Treaty Compliance

The ABM treaty, as amended in 1974, permits a single missile defense site equipped with ground-based tracking and guidance radars and up to 100 fixed, land-based interceptor missiles. The treaty prohibits mobile land-based, air-based, sea-based, and space-based ABM systems or components. The Bottom-Up Review considered program options that are treaty compliant as well as options that would require relief.

One option would be to deploy an ABM system that could provide a limited defense of the continental United States against a small-scale missile attack. Such a system, deployed at a single site in Grand Forks, North Dakota, would consist of a ground-based radar (GBR), 100 ground-based interceptors (GBIs), and upgrades to our existing early-warning radar system. While such a system would provide nationwide coverage against some types of attacks, levels of protection for substantial areas of the eastern and western United States would be inadequate in the event of other attacks.

Other options involve multiple sites, additional interceptor missiles, and/or reliance on missile tracking information from space-based sensors. These options are being examined in the context of a Presidential review of our BMD program and the ABM treaty. They raise ABM treaty compliance issues that must be resolved within the government and within the framework of our dialogue with Russia and perhaps other countries of the former Soviet Union before development or deployment could proceed. The present political instability in Russia could make it very difficult to negotiate such modifications to the ABM treaty for the foreseeable future.

Core Theater Missile Defense Program

To meet the growing threat from shorter-range theater ballistic and cruise missiles, the Bottom-Up Review considered a range of theater missile defense options. All options include a "core" set of TMD systems consisting of an enhanced version of the existing land-based Patriot air and missile defense system, called Patriot Advanced Capability, Level-3 (PAC-3); the sea-based Aegis/Standard Missile Block IVA; and the land-based Theater High-Altitude Area Defense (THAAD) missile system (see Figure 9).

Patriot Advanced Capability Level - 3. Our current ability to intercept shorter-range ballistic missiles is limited to the Patriot PAC-2 missile, which was used with partial success against modified Iraqi Scud missiles during the Gulf War. The immediacy of the tactical ballistic missile threat argues strongly for rapid deployment of improved theater missile defenses, such as PAC-3, that provide greater lethality and range, and are more capable against longer-range threats. PAC-3 would include an improved radar and either an upgraded Patriot missile or a new "hit-to-kill" interceptor missile.

The Aegis/Standard Missile Block IVA. The Navy currently deploys many cruisers and a growing number of destroyers equipped with Aegis radars and

Standard missiles for air defense operations. The Block IVA program would capitalize on this existing infrastructure by fielding upgraded Standard missiles and a modified Aegis radar to provide a sea-based TMD capability and improved performance against antiship cruise missiles. In some circumstances, a naval TMD capability could be in place in the vicinity of a regional conflict, providing protection for land-based targets before hostilities break out or before land-based defenses can be transported to the theater.

Theater High-Altitude Area Defense System. While modifications of existing systems can deal with most existing ballistic and cruise missile threats, the THAAD system is included in the core TMD program because additional capabilities will be needed to counter more advanced threats anticipated in the future. THAAD would defeat longer-range ballistic missiles, thereby minimizing the effects of weapons of mass destruction on the ground, and would also defend a larger area. When combined with either PAC-3 or the Standard Block IVA missile as a lower defensive tier, THAAD would anchor a highly effective layered defense of critical assets.

Brilliant Eyes. Brilliant Eyes (BE) missile tracking satellites offer the potential for significantly enhancing the capabilities of the core theater missile defense effort. Brilliant Eyes satellites would provide an autonomous missile surveillance and tracking capability for a number of regions of interest, or if cued by global surveillance satellites, they could observe missiles soon after launch. The unique contribution of BE is high-precision midcourse tracking, which allows interceptors to be launched when incoming missiles are still beyond the range of land- or sea-based radars. This means that intercept ranges would increase, particularly for long-range, wide-area defensive systems such as THAAD.

Brilliant Eyes missile tracking data could also be used for interceptor guidance updates, further increasing the defended area and offering a hedge against radar countermeasures or the loss of a radar. In

Theater Missile Defense

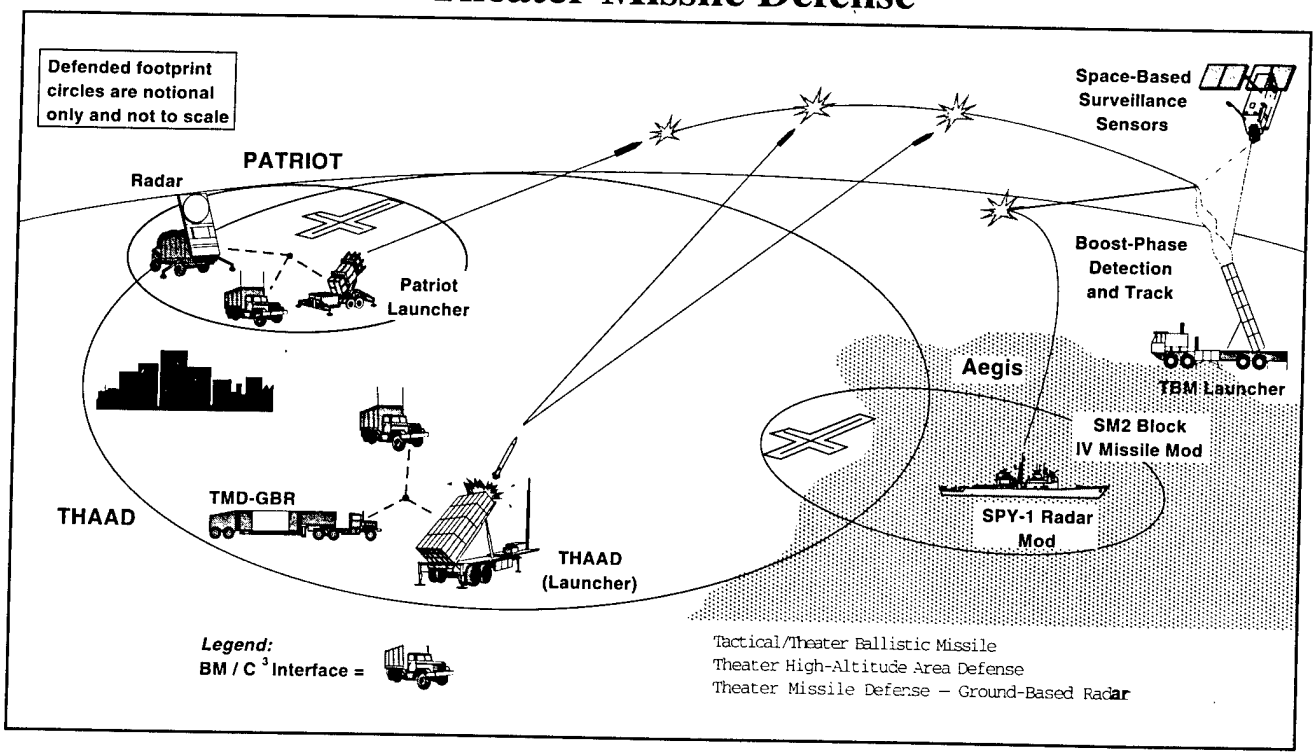


Figure 9

peacetime, the BE constellation could help collect intelligence data on emerging threats. A DoD working group is examining whether Brilliant Eyes might also have a role to play in fulfilling future strategic early-warning and surveillance requirements.

Additional TMD Programs

In addition to the core TMD program and Brilliant Eyes, the Bottom-Up Review examined the advantages and costs of proceeding with several other proposed TMD programs: a sea-based upper-tier program, the Army's Corps Surface-to-Air Missile (SAM) system, and ascent/boost-phase intercept capabilities.

Sea-Based Upper Tier. All sea-based concepts for higher-altitude missile ("upper tier") intercepts take advantage of the Vertical Launch System on naval combatants and offer very long-range intercept potential when supported by BE or some other over-the-horizon sensor. This is particularly true for concepts using an upper-stage intercept element based on Lightweight Exoatmospheric Projectile (LEAP) technology and carried by the Standard missile. These sea-based systems could provide extensive area protection.

Corps SAM. This new mobile air and missile defense system would protect Army or Marine maneuver forces against short-range ballistic missiles and advanced cruise missiles fired from any direction. In addition, Corps SAM would be more transportable, more mobile, and have more on-line missiles per battery than the Patriot PAC-3.

Ascent/Boost-Phase Intercept. We will also investigate the feasibility of defensive systems having earlier intercept capabilities so that enemy missiles could be destroyed while they are still ascending. This would be a joint Air Force-Ballistic Missile Defense Organization (BMDO) program.

TMD Options

Four TMD options that build on the core program were examined. The options differ with respect to the ways in which they supplement the core program and the time period in which the additional programs they provide would proceed through the acquisition process.

Option 1: Core TMD Program Plus Sea-Based Upper Tier and Corps SAM. This option, consisting of the core TMD program (PAC-3, THAAD, Standard Missile Block IVA) plus both the Sea-Based Upper Tier and Corps SAM systems, was the Bush TMD program. Proceeding with all five of these major system acquisitions would require about $14 billion in investment funding for TMD during FY 1995-99. This option would create a significant bow-wave problem in the period beyond the FYDP, due to the large number of systems acquired during the initial years.

Option 2: Core Program Plus Sea-Based Upper Tier. This option consists of the core TMD program plus the Sea-Based Upper Tier system and a less vigorous development effort for Corps SAM. Under this option, Corps SAM would not enter the demonstration/validation phase any earlier than FY 1998. About $12 billion would be needed in FY 1995-99 to implement the option. Post-FYDP acquisition funding would increase modestly.

Option 3: Core Program and Technology Demonstration. This option would pursue the core TMD acquisition program plus a technology demonstration only for the Sea-Based Upper Tier. Depending on the success of the technology demonstration effort, the Sea-Based Upper Tier system could transition to an acquisition program in FY 1998. Alternatively, development of Corps SAM could be started at that time. The estimated FY 1995-99 cost of this option is about $10 billion; no significant post-FYDP funding bow wave is projected.

Option 4: Core TMD program. This option consists of the core TMD program only, delaying the start of any additional acquisition program — Sea-Based Upper Tier or Corps SAM — until at least FY 1998. This option would require about $9 billion in funding in FY 1995-99 and about the same level of expenditure in FY 2000-06.

National Missile Defense Options

In evaluating options for national missile defense, three main factors were considered: technological promise, responsiveness to the projected threat, and ABM treaty compliance. Various NMD architectures were examined, consisting of the Ground-Based Radar and the Ground-Based Interceptor, with and without Brilliant Eyes. In addition, four different development approaches were analyzed.

Option 1: Standard Acquisition Program. This option would cost approximately $10 billion over the FYDP period. If started now, it could provide an initial operational capability by the year 2004. Pursuit of this type of NMD program might be appropriate if the likelihood that a potential adversary (e.g., Libya, Iraq, or North Korea) might acquire an intercontinental ballistic missile (ICBM) capability by 2004 was substantially higher than it currently appears to be.

Option 2: Systems Technology Demonstration Approach. This option would cost about $7 billion over the FYDP period. It envisions conducting enough development to ensure that the United States — given the knowledge of an emerging threat and the decision to start development — would have the capability to deploy a prototype ground-based system within about five years and production-quality hardware in about eight years. Although this approach could save $3 billion to $4 billion during FY 1995-99 relative to the first option, the total expenditure for a single, fully configured site (with production equipment) would be considerably more than if a standard acquisition program were started now. The specific option considered would permit a prototype deployment by 2003 (given a decision in 1999 to do so), with the first production hardware available in 2007.

Option 3: NMD Technology Program Plus Brilliant Eyes. This option would cost $3 billion over the FYDP years, including about $200 million annually for acquisition of Brilliant Eyes. It preserves a capability in the key technologies being investigated for NMD. Under this approach, it would take 10 to 15 years to deploy an operationally effective system from the time a decision was made to do so. Cost savings relative to Option 1 would be $7 billion to $8 billion during FY 1995-99. The NMD technology alternative would, in conjunction with TMD activities, preserve an adequate industrial base in critical technology areas.

Option 4: NMD Technology Program Without Brilliant Eyes Acquisition. This option would cost about $2 billion over the FYDP period. It is similar to the third option, except that a Brilliant Eyes acquisition program is not included. Option 4 would provide cost savings (relative to Option 1) of $8 billion to $9 billion during the FYDP years.

The Decision

In considering the proper approach to ballistic missile defense, the Bottom-Up Review examined a range of program options that emphasized theater missile defense, national missile defense, both TMD and NMD, or neither. The options ranged in cost from $15 billion to $25 billion, although each would generate significant savings compared with the Bush Administration's planned $39 billion expenditure on ballistic missile defense during FY 1995-99.

Given the nature of the present and projected threat from ballistic and cruise missiles armed with weapons of mass destruction, a decision was made to emphasize protection of forward-deployed U.S. forces in the near term and to proceed with a more robust TMD program, combined with a more limited NMD technology program.

On TMD, we have decided to pursue Option 2 — a TMD program that includes PAC-3, the Standard Missile Block IVA, THAAD, and the Sea-Based Upper Tier system, all funded as major acquisitions in FY 1995-99. We will also examine the feasibility of ascent/boost-phase intercept capabilities. Development of PAC-3 will allow major work on Corps SAM to be deferred until FY 1998.

On NMD, we will fund a technology program at approximately $600 million per year as a hedge against

the emergence of a greater long-range missile threat than is now projected. This program, in conjunction with the recommended TMD option, will preserve an adequate technology base in critical ballistic missile defense areas.

Specifically, Brilliant Eyes, or an equally effective alternative, would continue as a technology program; ground-based radar technology would advance through the GBR program for THAAD; and existing interceptor technology efforts, including THAAD and LEAP (if selected for the Sea-Based Upper-Tier system), would provide a development path to a ground-based interceptor for NMD.

Overall, the ballistic missile defense program will require an investment of approximately $18 billion over the FYDP period, with about two-thirds (or $12 billion) of the total expenditure directed toward TMD. This will provide a savings of about $21 billion compared with the previous Administration's BMD program.

We believe the recommended overall BMD program — a robust TMD effort plus a limited NMD technology program — is the best and most cost-effective approach. It is both consistent with our current understanding of the likelihood of a limited missile attack against the United States and provides the capabilities needed to defeat the more pressing theater ballistic and cruise missile threats.

SECTION V: MODERNIZATION

AIRCRAFT CARRIERS

New aircraft carrier procurement represents a significant investment for the Navy. In evaluating future requirements, the Bottom-Up Review assessed aircraft carrier modernization needs in light of the new international security environment. Modernization options — both new procurement and overhaul of existing carriers — were examined in the context of alternative carrier force levels. The review focused on procurement of CVN-76, the next new carrier the Navy has requested.

The review also examined the potential budgetary savings and other implications of consolidating nuclear aircraft carrier and submarine construction at a single shipyard. This issue was considered because reduced procurement rates for both submarines and carriers in the post-Cold War era have resulted in excess production capacity at shipyards.

Current Capabilities and Programs

With the decommissioning of the *Forrestal* (CV-59) and the *Ranger* (CV-61) at the end of FY 1993, the Navy will have 13 aircraft carriers, of which six are conventionally-powered and seven nuclear-powered. The nuclear-powered carriers include the *Enterprise* (CVN-65) and six ships of the Nimitz class.

The planned decommissioning of the *Saratoga* (CV-60) in the near future will result in a 12-carrier force, with no dedicated training platform. Currently, two Nimitz-class carriers, CVN-74 and 75, are under construction, and are planned for delivery by the end of the decade. To maintain a constant force level as new Nimitz-class carriers are introduced, the Navy plans to decommission some additional conventional carriers that still have service life remaining.

The Bush Administration planned to retain 13 carriers as part of the Base Force, 12 of which would be available for routine deployments, with the remaining ship serving as a dedicated training carrier. A contract for construction of the ninth Nimitz-class carrier, CVN-76, was to be awarded in FY 1995. Advance procurement funds for the nuclear propulsion plant for CVN-76 were authorized in FY 1993. The Bush FYDP also contained advance procurement funding in FY 1999 for CVN-77.

Options Examined

Nine options were examined — three variations in aircraft carrier modernization to support three different carrier force levels. Operating conventional carriers to their planned service lives or beyond, consistent with past practice, was considered in order to determine whether our conventional carriers could be kept in service longer than the Navy currently plans. As is discussed in more detail below, retaining these ships for longer periods could help to limit a potential procurement "bow wave" beyond the turn of the century at higher force levels.

The three modernization options evaluated were:

Option 1 would retain the current modernization program. It would procure CVN-76 in FY 1995 and provide advance procurement funds for CVN-77 in FY 1999, at a total acquisition cost of about $5 billion. Overhaul of the *Nimitz* (CVN-68) would also be completed, as scheduled, in FY 1998.

Option 2 would defer CVN-76 construction beyond the FYDP period, to FY 2000. It would extend the operational life of some existing carriers to their estimated service life or slightly beyond. Advance procurement funding for future CVNs would be deferred beyond FY 1999. The *Nimitz* overhaul would be completed on schedule.

Option 3 would procure CVN-76 in FY 1995, provide advance procurement funding for CVN-77 in FY 1999, but retire the *Nimitz* in FY 1998 in lieu of overhauling it.

Initially, a fourth modernization option was also considered. It would have retained the *America* (CV-66) beyond its planned decommissioning in FY 1996 and operated the *John F. Kennedy* (CV-67) for as much as eight years beyond that ship's current estimated service life. These steps would have been taken to compensate for delaying the construction of CVN-76. This modernization strategy was rejected because the technical difficulties involved would make a service life extension program (SLEP) for the *America* prohibitively expensive and further extending the *Kennedy's* service life would require an additional, unplanned and costly overhaul. Another factor in rejecting this option was the training and maintenance efficiency to be gained by transitioning to an all-nuclear-powered carrier force.

Three different force levels were considered in the evaluation of modernization options. The force alternatives included 10, 11, and 12 carriers, respectively. Variations in overall force levels were an important factor in assessing modernization costs and determining the industrial base implications of alternative modernization strategies.

Evaluation of Options

Five factors were weighed in evaluating each modernization option: (1) effectiveness in achieving warfighting and overseas presence requirements; (2) effects on the affordability of future carriers (i.e., the

Carrier Force Levels, Warfighting Risk, and Overseas Presence

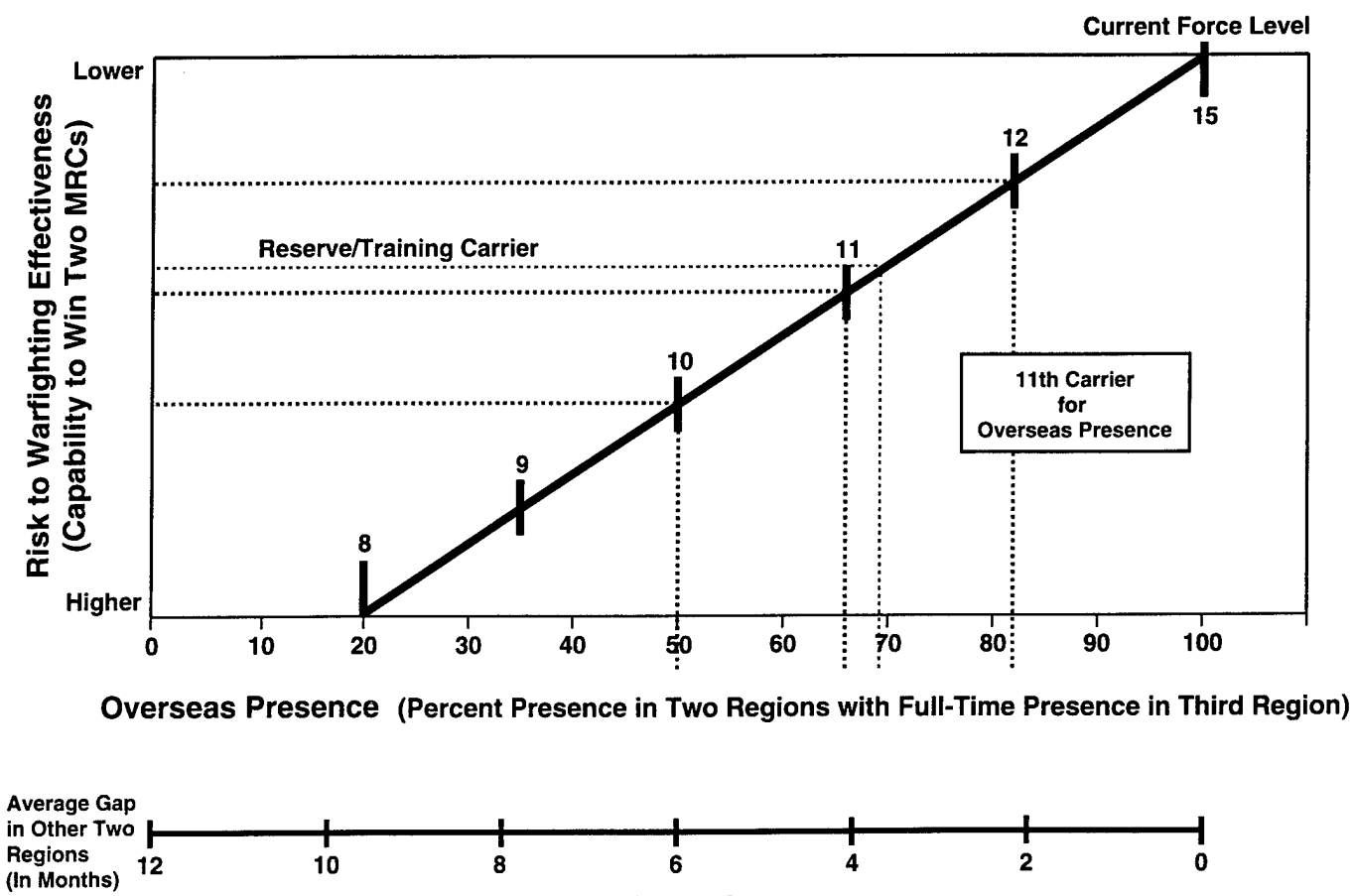


Figure 10

procurement bow wave); (3) the number of useful service years forgone by decommissioning conventional carriers early to maintain force levels constant as new nuclear carriers are delivered; (4) costs, including acquisition and nuclear refueling expenditures in the FYDP years and beyond; and (5) impact on the aircraft carrier industrial base.

Warfighting Effectiveness. First, the relationship of carrier force levels to warfighting capability in regional contingencies was reviewed. Figure 10 illustrates the increased risk to the successful accomplishment of warfighting tasks as carrier force levels are reduced. However, the analysis confirmed that a force of 10 carriers would be adequate to fight two nearly simultaneous MRCs. That assessment was based on many factors, from potential sortie generation capability and arrival periods on station to the independence of carrier-based aviation and its criticality if land-based air elements are delayed in arriving in the theater.

Overseas Presence Effectiveness. With regard to overseas presence, the analysis compared recent experience, with a total force of 14 to 15 carriers, to the peacetime overseas presence implications of a force with 10, 11, or 12 carriers.

As shown in Figure 10, a 15-carrier force could provide virtually full-time presence in three key regions where presence operations are important — the Mediterranean Sea, the western Pacific, and the Indian Ocean/Persian Gulf. A 12-carrier force could maintain a full-time presence in one region, with a minimum of two-month "gaps" in coverage in the other two. If the force were reduced to 11 or 10 carriers, the gap in regional coverage would increase. At a 10-carrier level, the United States could maintain a continuous presence in one region, but gaps in the other two would be as long as six months.

One way of reducing the effect on overseas presence of moving to a smaller carrier force would be to implement a "tether" policy for carriers. Under such a policy, carriers could operate within large areas yet be available to steam to specific staging areas within several days.

Along with implementing a tether policy, other ways of dealing with presence gaps were examined – for example, using ships other than carriers to provide overseas presence or homeporting additional carriers overseas, as is currently done with the *Independence* (CV-62) in Japan. Amphibious ready groups also could substitute for carrier battle groups in some, but not all, peacetime presence missions. Additional overseas carrier homeporting remains another potential option, but significant front-end costs, time, and diplomatic effort would be required to implement this concept successfully.

The interaction between aircraft carrier force levels and naval air wing requirements also was examined, in order to determine the most prudent and effective way to reduce the number of active and reserve air wings as carrier force levels decline. Because at least one aircraft carrier is usually in overhaul and thus not readily deployable, the Navy maintains one fewer air wing than it has carriers. Currently, the Navy has 11 active air wings and two reserve wings.

Also studied was a concept developed by the Navy calling for retention of a dedicated reserve/training carrier. This platform would be manned by a mostly active-duty crew and would be used both by Navy and Marine active and reserve pilots and crews during their initial and refresher carrier training. The carrier could deploy forward for limited periods either with an integrated active/reserve wing or with an active wing whose carrier was in long-term maintenance. This innovative new concept could improve overall reserve readiness, help fill gaps in overseas naval presence, and provide a rapidly deployable carrier for use in crises or conflicts.

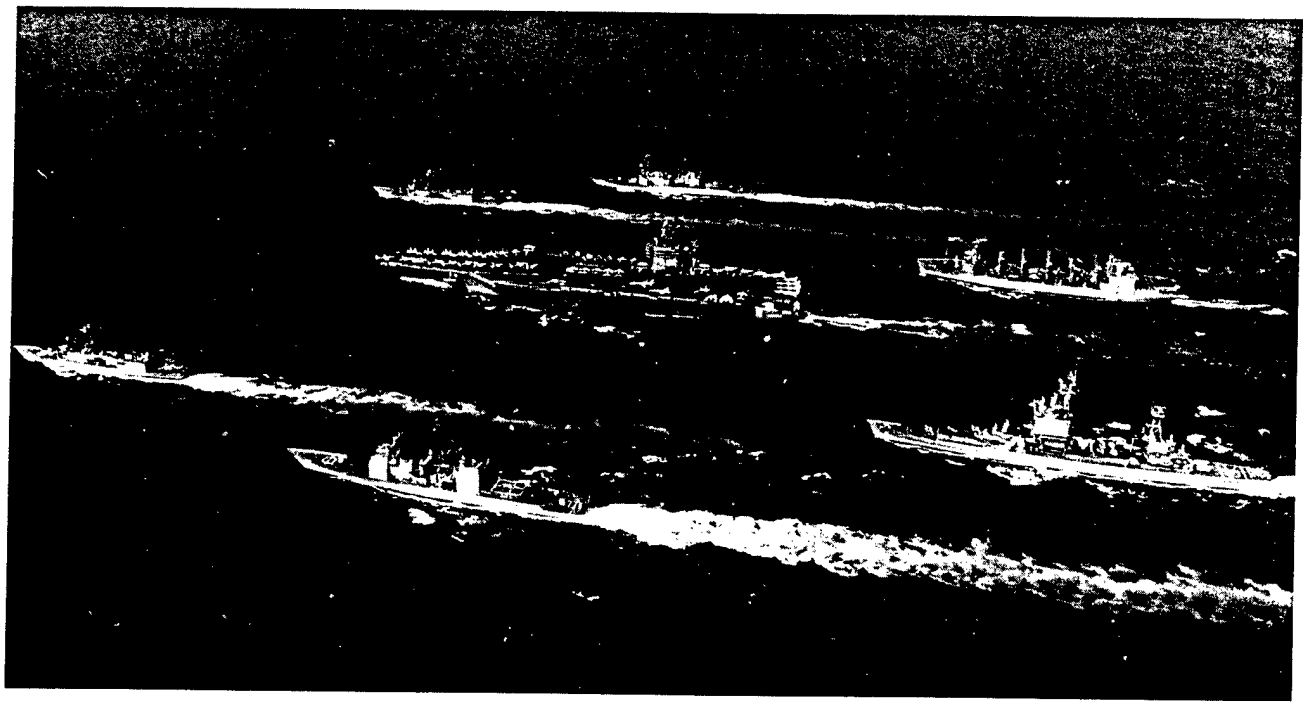
Affordability. Deferring construction of CVN-76 to FY 2000 could result in an affordability problem — a procurement bow wave — for carriers constructed in succeeding years. For example, at a 12-carrier force level, slipping CVN-76 construction to FY 2000 would require that four new nuclear carriers be funded during FY 2000-08 if conventional carriers were to be replaced as they reached the end of their service lives. The option of retiring *Nimitz* early in order to save funds over the FYDP period was eliminated at force

levels of 11 or 12 carriers, because it, too, would have worsened the procurement bow-wave problem associated with carrier construction beyond FY 2000.

Carrier Useful Life Forgone. Conventional carriers are built to last approximately 30 years. Through the Service Life Extension Program, the useful life of these ships can be extended another 15 years. Because additional nuclear carriers are already funded and under construction, one of the implications of moving to a smaller force level is that conventional carriers would have to be retired several years prior to the end of their service lives in order to make way for the new carriers. The Bottom-Up Review compared the useful service life forgone of three conventional carriers — *Kitty Hawk* (CV-63), *Constellation* (CV-64), and *Kennedy* (CV-67) — for each of the force level and modernization options considered. Under all three force levels, building CVN-76 in FY 1995 would mean forgoing some useful life of these existing carriers.

Cost Analysis. Delaying funding for CVN-76 to FY 2000 (and deferring advance procurement funding for CVN-77) would save approximately $5 billion in aircraft carrier acquisition costs during the FYDP period. However, the delay would add about $2.1 billion to the total cost of CVN-76's construction, including the cost of reconstituting the shipbuilder's production facilities, retraining the work force, requalifying vendors, overhead escalation, and direct construction costs. The annual cost to procure, operate, and maintain a 10-carrier force, averaged out over 35 years, is approximately $3.6 billion. An 11-carrier force costs about 10 percent more, or $4 billion. A 12-carrier force costs about $4.2 billion to $4.3 billion.

Industrial Base Assessment. Also assessed was the aircraft carrier industrial base, focusing on both the shipbuilder and the firms that provide the nuclear reactor and other key nonnuclear components for the ships. Results of the submarine industrial base study, completed as part of the attack submarine portion of the



The aircraft carrier Abraham Lincoln and its battle group.

Bottom-Up Review, were considered because the studies focused on the same shipbuilder and suppliers (or vendors) that manufacture nuclear propulsion systems.

It was concluded that delaying CVN-76 construction until FY 2000 would be a high risk for the shipbuilder. This is because existing contracts will be completed in the mid-1990s and a lack of subsequent orders would threaten the shipbuilder's viability by 1997 without additional work. This risk could be mitigated if certain actions were taken ahead of time. One option would be to do the necessary pre-shutdown planning to minimize the effort and cost that would be entailed in restarting carrier production — a "smart shutdown" of certain carrier construction capabilities. Another option would avoid a shutdown altogether by rescheduling delivery of carriers under contract, overhauls, and other work in order to help keep the facility open and functioning and to maintain essential construction capabilities.

Delaying CVN-76 construction would have less impact on the nuclear vendors, assuming that work proceeds in FY 1996 on components for a new nuclear attack submarine. The analysis indicated, however, that suppliers of nonnuclear and carrier-specific equipment could be affected by a delay in CVN-76 construction.

Consolidating Nuclear Aircraft Carrier and Submarine Construction

Currently, Newport News Shipbuilding Company, in Newport News, Virginia, builds both nuclear aircraft carriers and nuclear attack submarines. General Dynamics' Electric Boat Division in Groton, Connecticut, builds nuclear-powered ballistic missile and attack submarines. Because Newport News is technically capable of building nuclear carriers and submarines, the implications of consolidating construction of these ships at that facility were assessed.

Consolidating carrier and submarine construction at Newport News would save about $1.8 billion during the FYDP period. However, much of these savings are derived from not funding SSN-23, the third Seawolf submarine, which would provide a "bridge" in production to keep the Groton, Connecticut, shipyard viable and preserve the industrial base needed to produce a new attack submarine. Newport News would not need such a "bridge" submarine production contract, even if CVN-76 were delayed, if all future carrier and other submarine construction were consolidated there. This issue is discussed in more detail in the Attack Submarine section of this report.

The Decision

Construction of CVN-76. We have decided to proceed with construction of CVN-76 beginning in FY 1995. This decision preserves some flexibility on the ultimate size of the carrier force, protects the carrier industrial base, avoids the cost increase associated with delaying CVN-76's construction, and avoids a major carrier procurement bow wave beyond FY 1999.

Advance Procurement for CVN-77. We will defer long-lead funding for CVN-77 until after FY 1999, pending completion of a study evaluating alternative aircraft carrier concepts for the 21st century. This latter study will examine a full range of sea-based platforms to project air power and meet our military needs in the period 2020 and beyond. Platforms to be assessed will include Nimitz-sized carriers, both nuclear and conventionally-powered; smaller-sized carriers; larger-sized carriers; and "floating islands."

Consolidating Nuclear Aircraft Carrier and Submarine Construction. Because we remain concerned about the resulting loss of competition as well as other long-term defense industrial base and national security implications that would result from having only one provider for two key classes of naval vessels, we will not consolidate all carrier and submarine construction. However, we will continue to monitor this issue closely while examining other ways to balance industrial base considerations with reduced shipbuilding requirements.

Aircraft Carrier Force Structure and the Reserve Carrier. In order to reduce our overall force structure while still meeting our warfighting and overseas presence needs, we will maintain a naval force structure organized around 11 active aircraft carriers, 10 Navy active air wings, and one composite Navy-Marine Corps reserve air wing. We also plan to establish a reserve/training carrier to provide Navy and Marine active and reserve pilots their initial and refresher carrier training, and for occasional forward operations to cover overseas presence requirements.

SECTION V: MODERNIZATION

ATTACK SUBMARINES

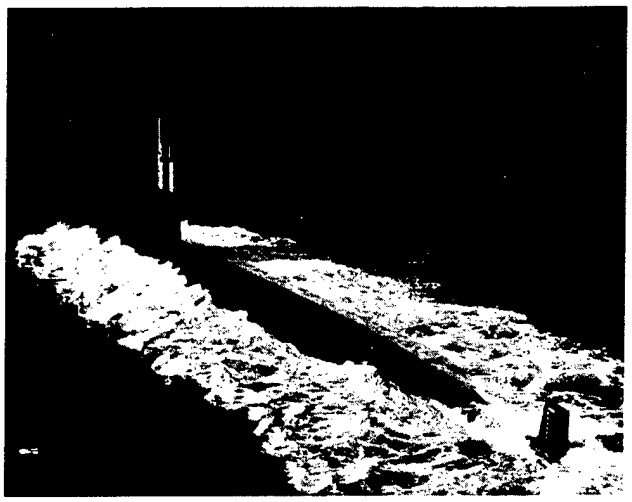
Nuclear-powered attack submarines are a valuable and flexible national asset — combining the elements of stealth, endurance, agility, and firepower on a single, multimission-capable platform. Attack submarines' stealth, combined with their advanced sensors and weaponry, means they can detect and attack adversaries or conduct land attacks with cruise missiles without first revealing their presence. Stealth also means covertness — attack submarines can routinely collect intelligence on enemy forces and movements without revealing that U.S. forces are present. Nuclear propulsion provides submarines with virtually unlimited endurance and the ability to operate at very high speeds for long periods of time. Finally, the diverse firepower of attack submarines gives them the ability to use not only traditional submarine weapons, such as torpedoes and mines, but also antiship and land-attack cruise missiles.

Attack submarine missions include regional sea denial, task force support, precision strikes, forward presence, surveillance, and special operations. Whether serving as key elements of joint task forces or naval battle groups, or deployed as independent units, attack submarines play an important role in U.S. defense operations.

Current Attack Submarine Force Levels and Programs

Today, the Navy has nearly 90 nuclear-powered attack submarines. These include two 594-class submarines, 31 Sturgeon-class (SSN-637) submarines, 39 Los Angeles-class (SSN-688) submarines, and 14 improved Los Angeles-class (SSN-688I) submarines. All of the 594- and 637-class boats will be decommissioned by FY 1999, as the Navy trims its force to approximately 55 attack submarines.

Currently, both Newport News Shipyard in Newport News, Virginia, and Electric Boat Shipyard in Groton, Connecticut, build nuclear-powered attack submarines. Nine improved Los Angeles-class submarines are under construction, three at Electric Boat Shipyard and six at Newport News. The Navy is also building two new Seawolf-class (SSN-21) attack submarines at General Dynamics' Electric Boat Shipyard. These two subs will be completed in 1996 and 1997, respectively.



The USS Alexandria, an improved version of the Los Angeles-class (SNN-688) attack submarine.

The Seawolf, originally slated as the replacement for Los Angeles-class submarines, was designed to counter increasingly more capable Soviet submarines. With the demise of the Soviet Union and the reduced threat of global war, Seawolf production has been sharply curtailed.

At the same time, the Navy has initiated development of a New Attack Submarine (NAS) — designed to be a more cost-effective replacement for the Los Angeles class. Under current plans, acquisition funding for the first NAS would be provided in the FY 1998 budget, with construction commencing in FY 1999.

The Threat

During the Cold War, attack submarines were critical to our ability to counter the Soviet navy, primarily the threat posed by Soviet attack submarines to our

surface combatants and merchant ships, which were vital to our ability to reinforce Europe in the event of a NATO-Warsaw Pact conflict. Our attack submarine force was also our principal means of holding Soviet ballistic missile submarines at risk.

Since the end of the Cold War and the dissolution of the Soviet Union, the restructured Russian submarine force has dramatically reduced its operations at sea. However, Russia continues to construct and deploy modern, high-quality attack submarines with capabilities that approach, and in some cases exceed, our own. Russia has also begun exporting some of its modern submarines abroad, including most recently selling three Kilo-class diesel-powered submarines to Iran.

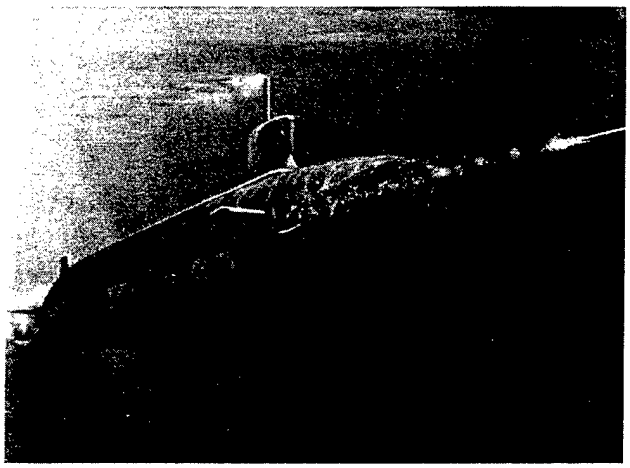
The Problem

The Bottom-Up Review addressed several issues with respect to the future size and shape of the U.S. attack submarine force.

First was the question of how many attack submarines are needed in the post-Cold War era. Ninety attack submarines are more than we need to fulfill the warfighting and overseas presence requirements of our new defense strategy. During the Bottom-Up Review, future requirements for both these missions were analyzed.

Second was the need to devise a cost-effective approach to modernizing the force as the overall number of attack submarines declines.

The third issue, linked to the first two, was the need to preserve our long-term ability to build attack submarines. This problem arises from the fact that the reduced requirement for new submarines as the force is drawn down has created a potential "gap" in new submarine construction that threatens the viability of the submarine production base. There will be a seven-year interval between the time the second Seawolf submarine was authorized (in 1991) and the start of construction of the first NAS, slated for 1998. Ongoing production to fill previous orders for SSN-688,



An artist's concept of the nuclear-powered attack submarine Seawolf (SSN-21)

SSN-21, and Trident submarines will be completed by 1997. When these submarines are completed, the Groton, Connecticut, shipyard will be without any additional submarine production work.

Force Level Options Examined

The elimination of the global threat formerly represented by the Soviet navy has created an opportunity to reduce the U.S. attack submarine force while reorienting it to reflect the new defense strategy and projected forward presence requirements.

Three different force levels were considered in the Bottom-Up Review. The options took into account the requirements of regional conflicts and presence operations, manpower and training needs, the present capabilities of U.S. attack submarines against foreign submarines, overhaul and refueling schedules, force age, and the attack submarine retirement profile. Detailed analyses of the options were performed by the Joint Staff with input from the Navy and OSD.

- **Option 1** would retain a force of 55 attack submarines. The analysis indicated that a force of this size could meet all wartime requirements for regional conflicts, as well as fulfill peacetime needs.

- **Option 2** would reduce the number of attack submarines to 45. This force also was found to be

• **Option 2** would reduce the number of attack submarines to 45. This force also was found to be capable of fulfilling warfighting requirements, but it imposed a greater degree of risk to peacetime missions than the larger Option 1 force.

• **Option 3** would reduce the attack submarine force by the greatest margin — to a level of 30 submarines. The analysis concluded that a force of this size would be unable to meet either warfighting or peacetime operational requirements.

Industrial Base Considerations

Several options were considered as a means of avoiding the potential consequences of a gap in submarine construction. Two alternatives emerged as the leading candidates. The first took steps to effect a "smart" shutdown of nuclear submarine construction at Newport News, with an eye to preserving the capability to resume production in the future, when circumstances warrant. A "smart shutdown" approach makes more sense at Newport News, since much of its skilled work force would continue construction of nuclear aircraft carriers. Thus, in effect, this option would end submarine production at the Groton, Connecticut, shipyard. It would require approximately $625 million in shutdown/reconstitution-related costs.

The second option provided for construction of a "bridge" submarine to avoid the adverse consequences of attempting to shut down a nuclear-certified shipyard and then having to reopen it at a later date. This option was more expensive than the first, costing about $1.8 billion, but was judged to be the better industrial practice and had the added benefit of providing the nation with a third state-of-the-art Seawolf attack submarine at a cost of only $1.2 billion more than the first option, which provided no third Seawolf.[2]

The Decision

The Bottom-Up Review concluded that, in response to the changing threat environment, the Navy should reorient its submarine force to focus on regional conflicts and presence operations, keeping in mind the increasing capabilities of foreign, primarily Russian, submarines. Specifically, the review determined that:

• A force of 45 to 55 attack submarines is needed to meet the requirements of our defense strategy, including both regional conflicts and peacetime presence operations.

• Production of a third Seawolf attack submarine in FY 1995 or FY 1996, which will be directed to the Groton, Connecticut, shipyard, would "bridge" the projected gap in submarine production.

• The Navy should develop and build a new attack submarine as a more cost-effective follow-on to the Seawolf class, with construction beginning in FY 1998 or FY 1999 at the Groton, Connecticut, shipyard.

These last two decisions will maintain two nuclear-capable shipyards, thereby mitigating the risk to the industrial base.

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[2] The $1.8 billion includes $1.5 billion in the FYDP period for the bridge submarine, as well as $300 million for smart shutdown/reconstitution–related costs. It does not include some prior appropriations or sunk costs for SSN-23, which brings the total cost to $2.4 billion.

SECTION V: MODERNIZATION

SPACE LAUNCH

Satellites are an essential element of America's military capability, as well as its economic security. These systems provide vital support to our forces in such areas as intelligence-gathering, surveillance, missile warning, communications, weather monitoring, and navigation. A robust space launch capability is integral to our ability to operate in space because it provides the means to place satellites into orbit.

Requirements for space launch are of two types: (1) performance — the ability to deliver a satellite (payload) reliably to a specific orbit, and (2) operational flexibility — the capability to perform rapid and adaptive payload integration, servicing, substitution, and launch. Today's launch systems meet the performance objective, albeit with less than desired reliability, but fall short of the operational flexibility goal.

The Bottom-Up Review evaluated the current and projected status of DoD's space launch capabilities, along with various options for future investments in launch vehicles and infrastructure. The review included an examination of U.S. military, civil, and commercial space launch needs; the international competitiveness of the U.S. commercial space launch industry; and the effect of various modernization options on the industrial base.

The Problem

As indicated in Figure 11, DoD maintains a fleet of expendable launch vehicles (ELVs) and also uses the space shuttle to place military satellites in orbit. The National Aeronautics and Space Administration (NASA) uses the shuttle as its primary launch vehicle, but also employs both DoD ELVs and commercial variants of these vehicles.

As a result of a 1970s decision to fly all DoD spacecraft on the NASA shuttle, DoD investments in space launch infrastructure and vehicle improvements virtually halted. Expenditures in this area remained relatively dormant until 1986, when the Challenger accident revealed the consequences of such an "all eggs in one basket" approach. Since then, DoD has gradually lessened its reliance on the shuttle to launch defense payloads, while increasing its investments in maintaining and improving the outdated ELV fleet and aging launch infrastructure.

Currently, the main types of launch systems used by DoD are the Delta II (manufactured by McDonnell Douglas), the Atlas I and II (produced by General Dynamics), and the Titan II and IV (made by Martin Marietta). Over the next several decades, launch rates in support of military satellite requirements are expected to be fairly stable at 15-20 per year, spread among the existing Delta, Atlas, and Titan boosters. While we are currently able to place all military satellites into their required orbits with this fleet, maintaining this capability over the long term will require significant investments in both the existing vehicles and the associated launch infrastructure.

Today, U.S. military space launch capabilities are characterized by high cost and serious operational limitations as a result of (1) the need to sustain three separate launch teams (for the three booster types) and associated support equipment, (2) the aging and obsolescence of major ELV components, and (3) continued dependence on outdated launch vehicle production lines and manpower-intensive launch processes. As a result, the performance and flexibility of launch operations is inadequate and system responsiveness in crises or emergencies is limited. For example, the current launch systems do not provide any overlap in performance — individual satellites are tied to specific space launch systems. Thus, Global Positioning System (GPS) satellites must be launched on Delta boosters, Defense Satellite Communications System (DSCS) satellites on Atlas boosters, and Defense Support Program (DSP) satellites on Titan boosters.

Primary U.S. Space Launch Vehicles

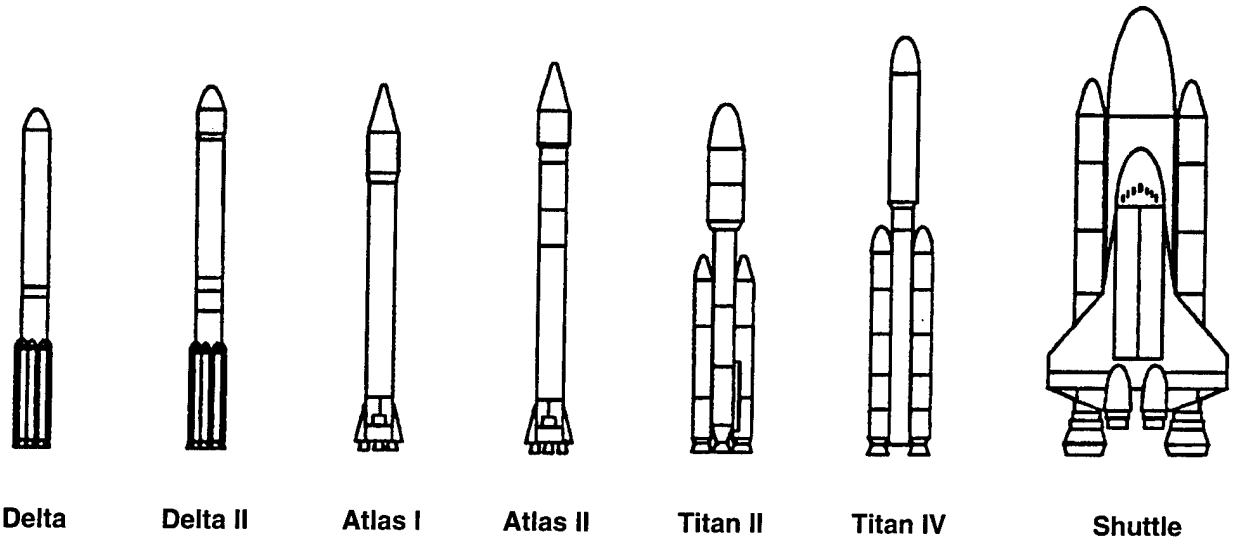


Figure 11

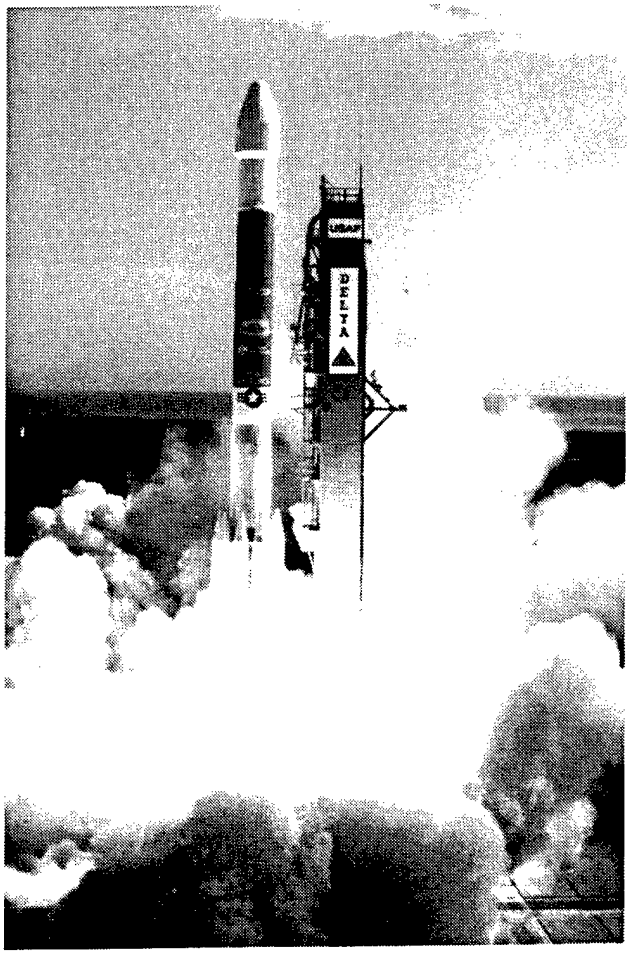
Another problem is the current production overcapacity in the American space launch industry. Because booster production is spread among three manufacturers, the industry is operating at less than 50 percent capacity, raising the unit cost of each booster. To date, there has been little effort to consolidate or reduce capacity, based on current and projected space-launch requirements. As DoD's demand for satellites continues to shrink, the ability to sustain three separate launch suppliers over the long term is in doubt.

Finally, there is the issue of foreign competitors, which have begun to offer reliable and low-cost space launch systems. The U.S. civil and commercial sectors average about 25-30 satellite launches per year — enough, along with the DoD launches, to sustain the three U.S. manufacturers. However, about half of the commercial satellites and some of NASA's satellites now use foreign launch systems. There is also a growing market for commercial space launches outside the United States. If U.S. space launch systems cannot compete better in both the domestic and international markets, the U.S. share of these markets will continue to decline, DoD will account for a larger share of the demand for U.S. launch systems, and consequently, DoD's own space launch costs will increase. If this should occur, DoD's current policy of "launch only on U.S. boosters" would become increasingly expensive.

Options Examined

To address these concerns, the Bottom-Up Review examined three different options for modernizing DoD's space launch capability: (1) extending the life of the current launch vehicle fleet to the year 2030; (2) developing a new family of expendable space launch vehicles to replace the current fleet starting in 2004; and (3) pursuing a technology-focused effort to develop a reusable launch vehicle that would effectively "leapfrog" the next generation of ELVs. In addition, more austere versions of Options 1 and 2 were developed that funded only "must do" improvements for the space launch and range infrastructure.

Option 1: Life-Extension Program for Current Systems. This option retains the three existing major launch systems (Delta, Atlas, and Titan IV) through the year 2030. It includes both robust (Option 1) and austere (Option 1A) variants for upgrading the space launch and range infrastructure, completing



Delta II launch from Cape Canaveral.

necessary maintenance and flexibility improvements, and funding cost-effective launch vehicle flexibility upgrades.

Option 2: New Launch System Development. This option replaces the current ELV fleet with a new family of "space lifter" launch vehicles. It also provides for current vehicle and infrastructure upgrades prior to and during a period of transition, from 2004 through 2013. Robust (Option 2) and austere (Option 2A) upgrade options are included.

Option 3: "Leapfrog" Technology Launch Systems. This option funds the development of an advanced reusable launch system and provides for current vehicle and infrastructure upgrades prior to and during a transition period that starts in 2010, leading up to the introduction of the new launch system.

Evaluation of Options

Option 1 makes investments in launch vehicles and infrastructure. It meets all launch-vehicle performance needs. All upgrades are considered to be cost-effective, and are identified in four priority categories. The robust version of this option includes upgrades in all categories; Option 1A, the austere version, includes only the most necessary enhancements. However, even the more ambitious upgrades to current launch systems fail to satisfy the flexibility requirement or meet improved reliability goals. Consequently, this option offers little potential for reducing the high operating costs of the current systems, since we would still be maintaining three independent launch teams, with the associated inefficiencies, due to overcapacity in the industrial base. This option would have little impact on anticipated U.S. payload development efforts. It appears to be the least expensive option, over the FYDP period, of those examined.

Option 1 also offers little opportunity for cooperative activities with NASA; it offers minimal assistance to the U.S. launch vehicle industry to support commercial competitiveness; and it results in U.S. systems that could be more costly and less reliable than certain foreign alternatives for the foreseeable future.

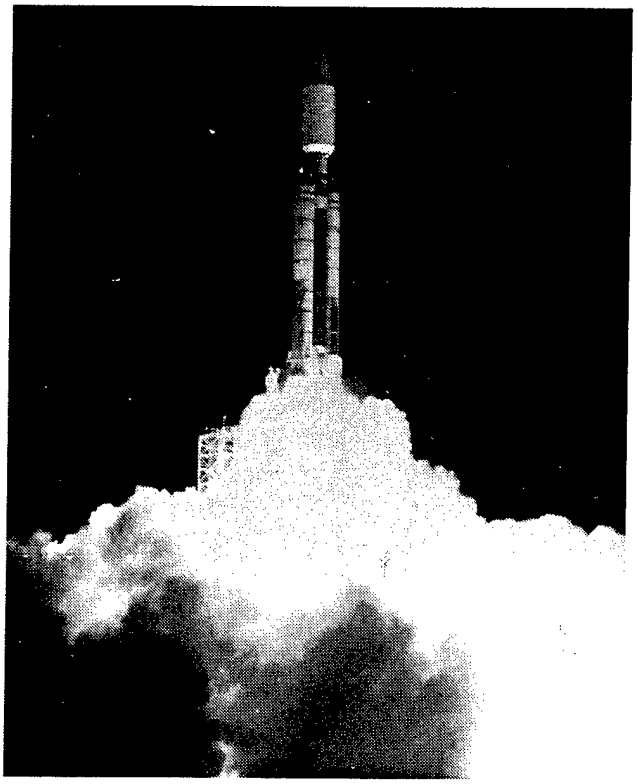
Option 2 also satisfies launch needs for current and projected U.S. military payloads. The design for this new generation of systems offers the potential for major improvements in both reliability and operational responsiveness, as well as significant reductions in operating costs. Significant investments in research and development would be required both during and beyond the FYDP years. The amount of these investments would depend on the particular design selected; since the new space lifter is still in the concept development phase, it is difficult to determine with accuracy its projected cost.

Because of the time needed to develop a new space lifter and integrate it with the variety of satellites it would carry, there would be a relatively long transition period, from 2004 to 2013, during which space

payloads would continue to be launched by current systems. Thus, in addition to the investment in the new space lifter, this option requires the same launch vehicle and infrastructure upgrades to existing systems as Option 1. An austere option, Option 2A, includes only the most necessary upgrades.

This option would be particularly effective in reordering the industrial base and reducing significantly the production and operating inefficiencies of current systems. There would also be greater opportunity for technical and fiscal cooperation with NASA in the development, production, and operations phases. Moreover, this option would improve the international competitiveness of the U.S. commercial launch industry.

Option 2 also offers the opportunity to expand cooperative efforts with Russia on commercial uses of space by introducing Russian technology into vehicle development and launch processing. The use of Russian technology, especially advanced liquid rocket engines, could also reduce the development time and cost of a new launch system. However, a principal policy concern is whether the United States should consider relying on a non-U.S. system to launch military satellites.



Titan IV launch from Cape Canaveral, Florida, carrying DoD satellite into orbit.

Although difficult to measure, this option offers the potential for reduced long-term costs if savings from higher reliability (less frequent failures and the associated cost of stand-down) as well as benefits (lower unit and operations costs) for the civil and commercial launch sectors are taken into account. Nevertheless, preliminary analyses indicate that it could be several decades before this "payback" in savings would be realized.

Option 3 was the most difficult to quantify, because of the large uncertainties inherent in the cost estimates, the high technical risk of some of the launch systems, and the breadth of the technologies that require significant investments within and beyond the FYDP period. During the analysis of this option, some of the new approaches were found to entail less technical risk and thus could be considered as variants within Option 2. Because Option 2 would have a concept development phase that considered all possible alternatives – including expendable, partially reusable, and fully reusable launch vehicles – it was determined that the concept phase would result in a better understanding of the technical and cost risks associated with those concepts.

Option 3 provides the long-term potential for the lowest operating and maintenance costs, primarily because of reusability. It would also offer the greatest change to the industrial base, because of the significant differences associated with producing a small number of advanced launch vehicles (4-6) and the operations of a reusable system. There would also be a significant opportunity for cooperation with NASA in developing the technologies, since most would be applicable to both manned and unmanned systems. Nevertheless,

the near- and mid-term costs of developing and producing these advanced launchers would be very high.

Because of the need to structure a technology readiness program that would last through the end of the decade, and given the fact that development of such a vehicle would extend well into the first decade of the 21st century, we would need to maintain the current fleet much longer (until the year 2015). This would result in significant investment costs at a time when development expenditures for the new system would be at their highest. For these reasons and because there are concepts that have less technical risk, this option was not considered to be viable, especially given current and projected budget constraints.

The Decision

After reviewing the alternatives, we selected the austere life-extension option (1A). This option adequately fulfills DoD's projected space launch needs at the lowest cost over the next decade. It includes the improvements needed in our space launch infrastructure. It also retains the option for incremental improvements to the current launch fleet to support future needs. Although a new launcher development effort would have permitted us to attain our desired goals for operational flexibility and reliability, and would have contributed toward improved competitiveness of the U.S. commercial space launch industry, those benefits did not outweigh the near-term costs of such an approach.

SECTION V: MODERNIZATION

MILITARY SATELLITE COMMUNICATIONS

There are four segments to the military satellite communications (MILSATCOM) architecture. First, ultrahigh frequency (UHF) satellites are the workhorses for tactical ground, sea, and air forces. Second, the superhigh frequency (SHF) Defense Satellite Communications System (DSCS), first deployed in the 1970s, supports long-distance communications requirements of military forces that cannot be met by ground-based communications systems. The DSCS system satisfies the majority of DoD's medium- and high-data-rate communications requirements. Milstar will soon be integrated as the third segment of the MILSATCOM architecture. It will provide a worldwide, secure, jam-resistant communications capability to U.S. civilian and military leaders for command and control of military forces. The fourth segment consists of commercial communications satellites, which are used to support DoD's MILSATCOM capabilities where jamming protection is not required.

The Bottom-Up Review evaluated MILSATCOM program alternatives in light of the projected threat, operational requirements, cost and effectiveness trade-offs, and affordability. The primary emphasis was on providing low-data-rate (LDR) and medium-data-rate (MDR) communication capabilities for U.S. tactical forces employed in one or more major regional conflicts, although the review also addressed requirements for strategic forces.

While all current MILSATCOM programs were reviewed, the focus was on identifying and evaluating lower-cost alternatives to Milstar. Milstar is a joint-service program to develop and acquire satellites, mission control elements, and new or modified terminals to support extremely high frequency (EHF) communications. The Milstar system would directly support the National Command Authorities (NCA) and the tactical and strategic forces of the unified and specified commanders-in-chief (CINCs) during all levels of conflict.

The Problem

The original Milstar program, initiated in the early 1980s, was designed to provide LDR communications for strategic and tactical military forces, primarily during a nuclear conflict. The highest-priority users were expected to be strategic and nonstrategic nuclear forces, with tactical naval, ground, and air forces having a lower priority. The original design included many special features intended to allow the system to survive and operate during a nuclear conflict.

Because of the greatly reduced threat of nuclear war in the post-Cold War era, Congress directed DoD in the fall of 1990 to restructure the Milstar program (now designated Milstar II) to emphasize its utility for tactical military forces and to reduce system costs. The system's survivability and endurability features and constellation size also were reduced.

Nevertheless, during preparation of the FY 1994 defense budget, the issues of Milstar affordability and alternative satellite designs were raised again. The Bottom-Up Review thus undertook a comprehensive evaluation aimed at determining the costs and effects on military capabilities of the Milstar program and alternatives to it.

Current Program

The current Milstar program would launch the first two Milstar satellites (Milstar I, LDR-only) in FY 1994 and FY 1995, respectively, and would develop an MDR payload for the first Milstar II satellite, scheduled for launch in FY 1999. The current program also includes funding for an as-yet-undefined "polar adjunct" to Milstar and would continue preparations for a Defense Acquisition Board program review of that adjunct. A complete constellation of LDR and MDR satellites would be achieved with the launch of the

fourth Milstar II satellite. Replenishment of the four-satellite Milstar II constellation would occur between FY 2006 and FY 2009, with the exact launch dates to be determined by actual satellite longevity. Ultimately, nine Milstar II satellites would be bought through FY 2011, including a spare satellite planned for delivery in FY 2003. Total expenditures for the Milstar program during FY 1994-99 would be almost $12 billion, including satellites and terminals.

Options Examined

As indicated in Figure 12, all alternatives to the current program would deploy advanced EHF satellites, and would therefore provide significantly more capability than we have today. All options would also launch the original two Milstar I satellites and eventually transition to Advanced EHF satellites that would be developed in the mid-to-late 1990s. The successor system would maintain as much LDR and MDR capability as possible while reducing satellite weight, which should help to reduce costs. The alternatives to the current program differ as to when the initial Advanced EHF satellite would be launched and, consequently, the MILSATCOM capabilities that would be provided in the meantime.

Option 1 (Milstar II/Advanced EHF) would retain four Milstar II satellites, with a first launch in FY 1999 (as in the current program), but it would eliminate the fifth Milstar II satellite (planned for delivery as a spare satellite in FY 2003) as well as subsequent Milstar II satellites. Full operational capability for LDR and MDR would be achieved on the same schedule as under the current program. Under this option, Advanced EHF satellites would be developed using advanced technology, to provide LDR and MDR capabilities comparable to those of Milstar II. Advanced EHF satellites would begin replenishing Milstar satellites around FY 2006.

Option 2 (MDR-Only/Advanced EHF) would cancel Milstar II and replace the four Milstar II satellites with satellites providing an MDR capability, but eliminating the LDR capability. The first MDR-only satellite would be launched in FY 2000, with a four-satellite constellation on orbit in FY 2003. This option would also develop Advanced EHF satellites with both MDR and LDR capability. The first of those satellites would be launched in about FY 2007.

Option 3 (Advanced EHF Only) would also cancel Milstar II, but it would replace that system with

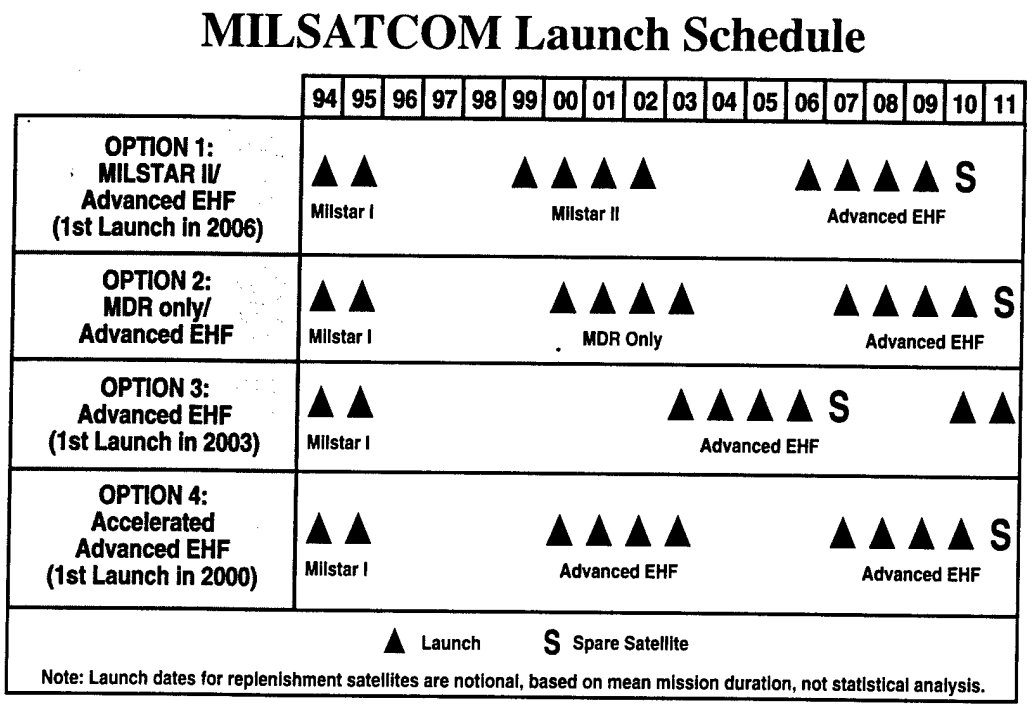


Figure 12

Advanced EHF satellites having both MDR and LDR capabilities. The first Advanced EHF satellite would be launched in FY 2003, with a four-satellite constellation in place in FY 2006.

Option 4 (Accelerated Advanced EHF) is similar to Option 3, except that it accelerates development of the Advanced EHF satellite, achieving a first launch in FY 2000 and a four-satellite constellation in FY 2003. This alternative would, if necessary, trade capability for weight on the initial satellites to maintain an FY 2000 launch date. Subsequent satellites could incorporate performance improvements, if needed.

Evaluation of Options

Two factors guided decisionmaking on Milstar alternatives. First, the military requirement for a jam-resistant advanced EHF communications system providing capability equivalent to Milstar II was reaffirmed early in the process. Second, while future national security requirements guided the evaluation of program alternatives, another important objective was to identify options that offered substantial cost savings relative to the current Milstar program.

An outside Technical Support Group was established to review the options and assess the level of risk, as well as to develop and evaluate additional Milstar alternatives. The Technical Support Group concluded that the most effective way to provide the desired communications capability in a cost-constrained environment would be with the new-design Advanced EHF satellites, deployed in geostationary orbits and providing both LDR and MDR capability.

The primary reason for considering options to the current Milstar program was to reduce system cost. Milstar II satellites would weigh approximately 10,000 pounds and, consequently, would have to be launched on Titan IV rockets — an expensive launching mode. The Technical Support Group recommended that DoD take advantage of recent technological advances to build substantially lighter satellites that could nevertheless provide performance comparable to Milstar II. The group concluded that a reasonable objective would be to transition to a lighter, advanced EHF satellite that could be boosted into orbit by a medium-launch vehicle (MLV). This would limit costs, which have historically been related to satellite weight.

The consensus of the Technical Support Group was that an Advanced EHF satellite that could be launched from an MLV could be available by 2003. However, the four-year delay between the scheduled launch of the first Milstar II satellite and the postulated launch of the first Advanced EHF satellite was a concern. Consequently, the Technical Support Group considered what capabilities could be provided on an Advanced EHF satellite if the first launch was accelerated to 2000.

The Technical Support Group did not reach a consensus on whether such an accelerated deployment of Advanced EHF satellites was possible. It identified as a major risk the lack of maturity in the packaging for microwave and digital electronics. A first launch in 2000 would be possible, according to some of the group members, using technology already developed or currently under development. Other members of the group concluded that there would be major risks associated with the concurrent technology demonstration, satellite design, and streamlined test program inherent in Option 4.

Cost Comparison

Total space segment costs (including launch costs) in FY 1994-2011 for the alternatives considered in the review ranged from $6.1 billion for the least costly option (Option 3) to $13.9 billion for the current program. Cost estimates for Option 4 varied from $7.2 billion to $11.3 billion, depending upon assumptions about risk of payload weight growth or schedule slippage.

Option 1 has essentially the same FY 1994-99 costs as the current program because it retains the first four Milstar II satellites, although it does achieve about $300 million in cost savings by canceling the Milstar II spare satellite. Further cost savings are achieved beyond the FYDP period by transitioning to the lower-

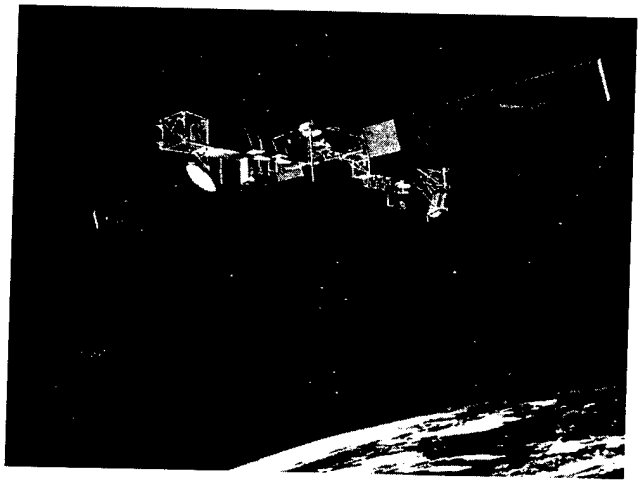
cost Advanced EHF satellite. FYDP savings of the other three options come predominantly from canceling the Milstar II program immediately and deferring MDR capability.

There are also differences in launch costs among the options, driven primarily by the differences in costs of the launch vehicles for the Milstar II satellites (Titan IV) and Advanced EHF satellites (Atlas IIAS). The Titan IV costs approximately $285 million per launch and the Atlas IIAS about $115 million.

Effectiveness Comparison

All of the alternatives to the current program would eventually provide sufficient LDR and MDR capability, although each has some shortfalls compared to the current program. The LDR shortfall is most severe in Option 2 because that option provides no substantial LDR capability until Advanced EHF satellites are launched beginning in 2007. Option 3, which provides for initial operations of Advanced EHF satellites in FY 2003, would delay initial MDR service by four years relative to the current program. Options 2 and 4 would delay MDR service by one year.

The Joint Staff assessed each option's ability to fulfill military requirements for EHF communications. It concluded that, while the concept of an advanced EHF follow-on to Milstar II is acceptable, the system should be designed to meet military requirements, not cost or weight limits. Options 2 and 3 were judged unacceptable because their schedules provide capabilities much later than does the current program or Option 1. The technical, cost, and schedule risks of Option 4 were considered to be too high. The Joint Staff also concluded that the LDR capability provided by Advanced EHF satellites would be reduced relative to Milstar II because these satellites would provide fewer antennas than Milstar II.



Milstar

In summary, the options differ in cost, capability, risk, and schedule. Those options that do not contain Milstar II satellites trade costs for capability and/or schedule. As cost savings increase, risk increases and deployment of EHF capability is delayed.

The options containing four Milstar IIs were determined to be most preferable because a constellation of that size would meet military requirements and provide the most operational capability at the earliest date. Option 3 was considered unacceptable because it would delay LDR and MDR capability by four years. Option 4 would provide capability sooner, but its schedule was considered high risk.

The Decision

After reviewing the alternatives, we decided to proceed with Option 1, deploying both Milstar I and the initial constellation of Milstar II satellites, then transitioning to a lower-cost, lower-weight Advanced EHF satellite that would be launched initially by FY 2006. We believe that this represents the best means of achieving a needed military communications capability in the near term while potentially reducing the long-term costs associated with sustaining this capability.

SECTION V: MODERNIZATION

V-22 OSPREY TILT-ROTOR AIRCRAFT

In 1981, the V-22 program was initiated as a joint-service effort to develop a tilt-rotor aircraft incorporating advanced avionics and composite technologies. Such a system would offer significant improvements over existing and projected helicopter capabilities. As originally envisioned, the V-22 Osprey aircraft was to be produced in various versions for use in a range of military missions. Initially led by the Army, the V-22 program was transferred to the Navy in 1982, when the Army withdrew because of concerns about the system's affordability. One of the principal intended users of the V-22 was to be the Marine Corps, which has an acute need to replace the CH-46 and CH-53 helicopters that fulfill its medium-lift requirement — that is, transporting personnel, supplies, and equipment ashore during amphibious assaults. The V-22 was intended to satisfy certain Navy, Air Force, and special operations force (SOF) needs as well.

V-22 Osprey.

In 1989, the V-22 program was terminated by the Bush Administration, and then-Secretary of Defense Cheney directed the Navy to develop an alternative aircraft. In response, the Navy established and funded a program to investigate an alternative, called the Medium Lift Replacement (MLR). However, Congress consistently voted to fund continued V-22 development and refused to provide funding for the MLR program.

In July 1992, DoD and Congress worked out a compromise that added funding to the defense budget for demonstrations of both V-22 technology and other medium-lift helicopter technology, leaving for future years the decision on which technology would best meet DoD's medium-lift needs. Over the succeeding years, development of the V-22 at a limited funding level proceeded and study of an alternative MLR helicopter was begun.

The Problem

While the Congress and the Bush Administration dueled over the merits of the V-22, the Marine Corps' need for a medium-lift replacement aircraft grew. Its inventory of CH-46s and CH-53As and Ds continued to age and decline through attrition, resulting in a fleet that cannot currently meet Marine Corps requirements. Moreover, while the compromise on V-22 worked out between the Congress and the Bush Administration kept the V-22 program alive, the Bush 1994-99 FYDP did not fund V-22 development at a level sufficient to allow the system to proceed toward production.

Status of the V-22 Program

No task force was established under the Bottom-Up Review to examine the V-22 program because the program is being reviewed under the auspices of the Defense Acquisition Board (DAB). On June 30, a committee within the DAB reported to the Under Secretary of Defense for Acquisition on the status of its V-22 review, taking into consideration applications of the V-22 for both the Marine Corps and special operations forces, and the status of the alternative MLR program.

The purpose of this review was to: (1) decide on a path for defining the right program to meet relevant requirements for the Marine Corps and SOF; (2) re-

view the status of the V-22 and MLR programs, including the technical objectives, milestones, funding, contract structure, and technical and cost risks entailed; and (3) provide guidelines to support a future decision on the requirements, structure, and funding of the two programs. The review also examined potential commercial applications of tilt-rotor technology. The range of V-22 options examined over the past several months covered various funding and procurement profiles for SOF and the Marine Corps.

In June, the DAB concluded that a focused effort should be undertaken over the next few months to define the acquisition options more precisely. There will be a series of reports and progress reviews, all coordinated by the Under Secretary of Defense for Acquisition, leading to a program decision in the fall of 1993. We expect that these efforts will provide a range of V-22 options and MLR helicopter alternatives to guide the Department in choosing the right option to fulfill SOF air transport and Marine Corps medium-lift requirements in a cost-effective and affordable manner.

SECTION VI

INITIATIVES

The new dangers and opportunities of the post-Cold War world require the United States to act proactively to protect and enhance its national security. We must seek not only to counter threats to our security as they arise, but to prevent them from occurring in the first place. We must also seize opportunities to shape the international environment in ways favorable to our interests. Toward these ends, the Department of Defense is undertaking a series of new policy initiatives, including:

- Cooperative threat reduction
- Counterproliferation
- Former Soviet Union defense/military partnership
- Global cooperative initiatives — peacekeeping and peace enforcement, humanitarian assistance, disaster/famine relief, and the promotion of democracy through military-to-military contacts.

By mitigating the dangers against which future defense dollars would otherwise have to be spent, these initiatives have the potential to save more than they cost.

Cooperative Threat Reduction

As Russia, Belarus, Ukraine, and Kazakhstan implement their respective arms reduction commitments and responses to the U.S. presidential nuclear initiatives of September 1991 and January 1992, hundreds of strategic offensive arms and thousands of nuclear warheads must be dismantled. Russia must also ensure the safety and security of its remaining nuclear arsenal and meet its commitment to completely destroy the huge chemical arsenal it inherited from the former Soviet Union.

These would be difficult tasks even without the massive economic, political, and military dislocations engendered by the dissolution of the former Soviet Union. But such dislocations have increased the risk that nuclear weapons could be subject to accidental or unauthorized use, could form the basis for the emergence of new nuclear weapons states, or even could fall into the hands of terrorist groups. The dislocations have also increased the danger that the materials and know-how needed to develop nuclear weapons could leak through porous FSU borders to other countries.

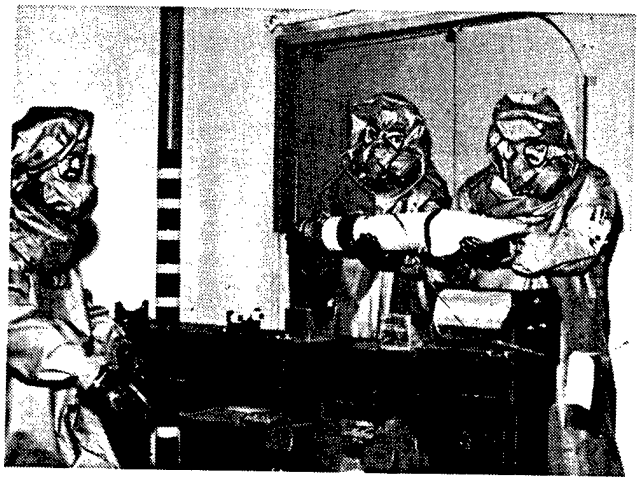
The United States simply cannot afford to ignore these risks. The Cooperative Threat Reduction initiative aims to reinvigorate and expand upon past and ongoing U.S. efforts to actively assist in the destruction of FSU weapons of mass destruction and the prevention of weapons proliferation.

Specifically, this initiative builds upon the historic "Nunn-Lugar" legislation, which authorized the Department of Defense to transfer, subject to restrictions, up to $800 million in FY 1992-93 appropriations or working capital accounts to assist eligible FSU states to:

- Destroy nuclear, chemical, and other weapons.
- Transport, store, disable, and safeguard weapons in connection with their destruction.
- Establish verifiable safeguards against the proliferation of such weapons.
- Facilitate demilitarization of defense industries and conversion of military technologies and capabilities to civilian use.
- Expand military-to-military and defense contacts between the United States and the newly independent states.

The United States has made political commitments to provide approximately $420 million in Nunn-Lugar assistance to Russia, at least $175 million to Ukraine, and up to $75 million to Belarus. To date, the Department of Defense has notified Congress of proposed obligations totaling $488.5 million for specific Nunn-Lugar projects for which the necessary agreements are signed or awaiting signature or parliamentary ratification. If ongoing discussions with the eligible states prove successful, additional implementing agreements could be signed in the next few months that would absorb nearly all of the remaining $311.5 million.

The Cooperative Threat Reduction initiative for the FY 1994-99 period retains key elements of the existing "Nunn-Lugar" legislation — in particular, its emphasis on the safe and secure transportation, storage, and elimination of nuclear weapons and on nonproliferation — and targets some new areas for additional assistance as well:



Workers disassembling chemical munitions.

- Destroying weapons of mass destruction in the FSU and removing all nuclear weapons from Ukraine, Belarus, and Kazakhstan, including dismantling strategic nuclear delivery vehicles to comply with the START I and II treaties and destroying chemical weapons.

- Constructing a safe, secure, and environmentally sound storage facility for fissile material from dismantled nuclear weapons in Russia.

- Preventing the proliferation of weapons of mass destruction, their components, related technology, and expertise within and beyond FSU borders, including the establishment of effective export-control systems, fissile material control and accountability systems, physical protection systems and, possibly, additional resources for the science and technology centers being established in Moscow and Kiev.

- Advancing the complex and costly effort to achieve the environmentally safe elimination of the chemical weapons arsenal in Russia.

- Other projects to keep the process of denuclearization and demilitarization on track in the FSU, including environmental restoration of former strategic offensive arms bases, defense conversion, retraining and housing of former military officers, and expanded military and defense contacts.

To implement this initiative, a separate Cooperative Threat Reduction line-item account is being proposed with an additional $400 million in DoD funding for FY 1994, to remain available until expended.

The United States cannot and should not bear the entire threat reduction bill for these four newly independent states, and we will continue to insist that they do their part. We are also pressing key European allies and Japan to increase their helpful, but relatively modest, assistance to the FSU in this area.

This initiative will require a significant effort by the Administration, Congress, and ultimately the American people. But it is essential to U.S. and international security in the post-Cold War era. This is not "foreign assistance" as traditionally defined. Rather, it is a unique and relatively small investment in U.S. national

security from which we stand to reap great benefits, including savings in defense programs that might otherwise be necessary to deter or defend against FSU weapons of mass destruction in the future.

Counterproliferation

More than 25 nations either have or are attempting to acquire weapons of mass destruction — nuclear, biological, or chemical. In most areas where U.S. forces could potentially be engaged, our likely adversaries already possess chemical and biological weapons. Most of these states are striving to acquire nuclear arsenals as well.

Several new realities are contributing to the spread of WMD and related technology. First, alternative suppliers of WMD technologies and delivery systems are emerging, with countries such as North Korea offering to sell technologies and missiles with little regard for the ambitions of recipient states. In addition, the indigenous capabilities of countries of concern are improving. There is also the new danger of nuclear, biological, and chemical weapons, materials, equipment, and knowledge leaking from the former Soviet Union. Further, the challenges associated with controlling dual-use technologies have grown.

In the hands of a hostile regional power, weapons of mass destruction could threaten not only U.S. lives but also the viability of our regional power projection strategy. For example, if a state opposed to U.S. interests were to acquire nuclear weapons, it could use them in a conflict or crisis in any number of ways, from threatening to attack a neighboring state in an effort to dissuade it from requesting U.S. assistance to threatening American and allied forces or cities in an effort to deter U.S. intervention altogether. Furthermore, the unpredictable nature of some Third World regimes, coupled with the fact that potential adversaries may have more at stake in a regional conflict than the United States, means that the United States' ability to deter such actions may at best be uncertain.

In these circumstances, our nation not only must seek to prevent the spread of weapons of mass destruction, but it must be prepared to respond to the military threat posed by these weapons should nonproliferation efforts fail. We are not resigned to the failure of nonproliferation regimes; rather, confronted with the possibility of even limited failure, we must ensure that our forces have the capabilities they would need to confront an opponent armed with weapons of mass destruction in a future crisis or conflict. The counterproliferation initiative is designed to develop a coherent strategy to prevent additional countries from acquiring WMD and, should such efforts fail, to deter these weapons' use against the United States and its allies, to defend against them if they are used, and to ensure that U.S. armed forces can successfully carry out operations in a conflict involving the use of nuclear, chemical, or biological weapons.

Toward that end, we are assessing the military capabilities needed and correcting any deficiencies that may exist. Our assessment will cover the following broad areas:

- Intelligence
- Battlefield detection
- Passive defenses
- Active defenses
- Counterforce capabilities
- Inspection and verification support
- Export control support

DoD's counterproliferation approach, which is designed to complement and strengthen the traditional nonproliferation efforts of other U.S. government agencies, will be implemented in three parts. First, we will strive to foster an international environment that discourages the proliferation of weapons of mass destruction and to strengthen export controls and related arms control arrangements. Second, in our forces and programs, we will determine the specific capabilities needed to counter proliferation, identify existing DoD efforts that contribute to these capabilities, specify remaining deficiencies vis-a-vis threats from weapons of mass destruction, and devise programmatic options to address those deficiencies. Finally, in our tactics and contingency plans, we will seek to improve our ability to deter the use of nuclear, chemical, and biological weapons, to develop doctrine and tactics for dealing with them, and to incorporate WMD threats into our planning.

This initiative will be a multifaceted, multiyear effort involving numerous and diverse components of DoD. Not all of these activities are captured in the $40.5 million requested for counterproliferation in FY 1994.

Countering proliferation is central to addressing both nuclear and regional dangers in the post-Cold War world. Strengthening the U.S. military's capabilities for meeting the threat of the proliferation of weapons of mass destruction is one of the Department's most important responsibilities in the new security environment.

FSU Defense/Military Partnership

The post-Cold War trend toward democracy and liberal reform only bolsters the security of the United States. Not only are Western values ascendant, but prospects for the peaceful resolution of disputes improve as democracy spreads, and the potential for global prosperity increases as more countries adopt market reforms.

But these trends are not irreversible. In most former communist countries, democratic institutions are not yet firmly in place, and market reforms have yet to produce tangible improvements in the standard of living. The reversal of these trends could have a profound impact on U.S. security and on U.S. defense requirements. Nowhere is this more true than in the former Soviet Union.

The FSU Defense/Military Partnership initiative seeks both to lessen the likelihood of the failure of reform and to hedge against it. Its primary objective is to develop a solid partnership between the defense establishments of the United States and the former Soviet Union in an effort to encourage support for reform, develop FSU militaries responsible to democratically elected officials, encourage U.S.-FSU defense cooperation in areas ranging from regional conflicts to counterproliferation, and convince an expanding circle of officers and officials that the United States seeks a real partnership. Particular attention will be paid to Russia, Ukraine, Kazakhstan, and Belarus — the four FSU states with nuclear weapons still maintained on their soil. Enhancing our military cooperation with these states and building partnerships with them will be crucial in facing the dangers of the post-Cold War era.

Russian Federation Minister of Defense Grachev and Secretary Aspin signing memorandum of understanding on defense contacts.

This initiative has three main components:

- ***Expanded defense and military contacts,*** moving beyond a series of single contacts to programs that foster ongoing relationships between individual U.S. and FSU military/defense leaders or provide concrete technical assistance.

- ***Enhanced military cooperation,*** expanding on unit exchanges, sister base/unit programs, and ship visits, and developing the capability for combined peacekeeping, humanitarian assistance, and other noncombat operations.

- ***Support for transition and reform,*** focusing on concrete measures to address pressing social concerns affecting the military, such as military housing shortages, inadequate medical care, and environmental degradation at military sites.

FY 1994 funding for this initiative comes from the Cooperative Threat Reduction line item.

Global Cooperative Initiatives

The Global Cooperative Initiatives seek to improve our ability to respond to new regional dangers while positioning us to capitalize on a number of post-Cold War opportunities. They do not, however, prejudge when or how we should respond to a given situation. Rather, they seek to enable DoD, in cooperation with other U.S. government agencies, to prepare the ground for a more effective U.S. response if and when such a response is deemed appropriate and necessary by the President and the Congress.

More specifically, these initiatives seek to enhance DoD planning and capabilities for peacekeeping and peace enforcement operations, humanitarian assistance measures, disaster and famine relief activities, and the promotion of democracy. As such, they are only one part of what must be a national, multi-agency effort in these areas.

Peacekeeping and Peace Enforcement Operations

Traditionally, ***peacekeeping*** — military operations, undertaken with the consent of all major belligerents, that are designed to monitor and facilitate implementation of an existing truce agreement in support of diplomatic efforts to reach a political settlement to a dispute — and ***peace enforcement*** — military intervention to compel compliance with international sanctions or resolutions designed to maintain or restore international peace and security — have been seen as secondary missions for the U.S. military. They have been lesser-included cases of more demanding missions, such as fighting and winning major regional conflicts. Accordingly, planning for these missions has often been undertaken on an ad hoc basis, and funding has generally been drawn from operations and maintenance accounts as needed. As a result, these operations have often been funded at the expense of readiness, pending subsequent reprogramming or supplemental funding. Keeping our forces ready to fight requires that we do business differently in the future.

As peacekeeping and peace enforcement gain new prominence among U.S. military missions in the post-Cold War era, DoD will earmark funds for these missions to help other countries and the United Nations strengthen their peacekeeping and peace enforcement capabilities, and in so doing reduce the demand for U.S. forces. Investments in this area also will facilitate rapid military responses to decisions to commit U.S. forces to such operations; they will minimize the impact of U.S. participation in such operations on service budgets; and they will permit greater policy oversight of these operations.

Proposed funding for these initiatives is $300 million in FY 1994: $260 million for reimbursement of incremental DoD costs for peacekeeping and peace enforcement and $40 million for assistance to third countries and international organizations in support of sanctioned international peacekeeping or peace enforcement activities.

Humanitarian Assistance and Disaster/Famine Relief

The rise of regional dangers on the U.S. security agenda has increased the importance of the U.S. military's role in providing humanitarian assistance and disaster and famine relief to foreign populations in need. Operations directed at alleviating human suffering and meeting the basic needs of victims of social dislocation, economic strife, political conflict, or natural disasters can, in some cases, be the best foreign policy instrument available to the United States. Humanitarian operations can also prove an effective means of addressing potential sources of regional instability before they lead to armed conflict, and of promoting recovery and nation-building after crises have occurred.

In FY 1993, $28 million in DoD funds was appropriated for humanitarian assistance programs, $50 million was provided for disaster relief activities, and $10 million was allocated for disaster relief planning. In addition, $40 million was provided in supplemental appropriations for Kurdish relief efforts in FY 1992 and $115 million was transferred from other DoD

appropriations to provide humanitarian assistance to the former Soviet Union in FY 1992-93. Much of this assistance took the form of DoD deliveries of excess property as well as privately donated supplies — including medical supplies, clothing, shelter, food, heavy equipment, and vehicles. It also included coordinating large-scale air, land, and sea operations and evacuating refugees and disaster victims in need of medical care.

The Humanitarian Assistance and Disaster/Famine Relief initiative will consolidate a wide variety of existing programs under a single umbrella within DoD to:

- Develop and refine strategies for delivering excess DoD property, privately donated supplies, and other assistance to countries in need.

- Improve the efficiency, effectiveness, and timeliness of DoD's existing humanitarian assistance and disaster and famine relief efforts.

- Facilitate contingency planning with other U.S. government agencies as well as international and nongovernmental organizations to ensure DoD relief preparedness.

- Expand cooperative relationships with leading U.N., private voluntary, and other international organizations to facilitate non-U.S. government humanitarian assistance efforts.

Proposed funding for FY 1994 is $48 million for humanitarian assistance and $50 million for disaster/famine relief, including:

- ***Excess property donations:*** Repairs, packing, processing, warehousing, and other costs associated with preparing property for delivery.

- ***Transportation assistance:*** Air, sea, and overland transportation of personnel and materiel.

- ***Planning and training:*** Preparedness and assessment activities, including studies, exercises, and specialized training.

- ***Relief activities:*** Provision of shelter, food, water, and medical supplies to countries in need.

Promotion of Democracy

One of the most significant dangers in the post-Cold War era is the possibility that democratic reform in newly independent states might fail, reducing the chances that a coalition of democracies favoring peaceful means of resolving disputes will take root and flourish. One of the most significant opportunities for the United States in this new era is the chance to promote democracy in other countries and, in so doing, to promote a more peaceful world.

The Department of Defense has an important role to play in promoting democracy. Toward this end, it has requested $50 million in FY 1994 to develop and integrate a variety of military-to-military programs and associated defense contacts as well as other activities designed to promote democracy. These efforts focus on countries other than those targeted for assistance under the Cooperative Threat Reduction initiative. The programs include:

- ***Ongoing military and defense contacts*** that focus on familiarizing military and defense officials from emerging democracies with appropriate roles of a professional military in a constitutional democracy, such as the Army European Command's Joint Contact Team program in central and eastern Europe.

- ***Expanding such military and defense contacts*** to additional countries in eastern Europe.

- ***Developing similar contact programs in other regions,*** namely Africa, Latin America, Asia, and the Pacific.

Promoting democracy in other countries is central to international stability and to the prospect of a more peaceful world. This relatively small expenditure of DoD resources has the potential to obviate the need for the far more costly defense efforts that might be necessary should democratization fail.

SECTION VII: DEFENSE FOUNDATIONS

FORCES READY TO FIGHT

The first priority of the Clinton-Aspin defense plan is to ensure that the United States has forces ready to fight today and in the future.

Currently, we have the best and most ready military force in the world. We have worked hard to get it that way over the past several years. Now, we face the even more difficult challenge of preserving readiness as we reduce the defense budget, draw down our overall force structure, and reorient our armed forces toward the new dangers facing us in the post-Cold War world.

Our approach to preserving readiness will be not only to identify readiness problems as they emerge and take corrective action, but also to anticipate, and thus prevent, problems from occurring through development of a readiness "early warning system." This focus on prevention guides our readiness planning and organizational innovation. It is also one of our most difficult challenges.

Defining Readiness

The first problem in addressing the issue of readiness is that there is no simple way to define what readiness is, and what it is not. Broadly speaking, almost everything DoD does is related to readiness. Yet, such a broad definition suggests that any reduction in the overall defense budget automatically reduces readiness — an overly simplistic conclusion that does not help to establish priorities in defense planning. However, too narrow a definition may shift the focus to individual units, underemphasizing the "joint" readiness we seek from our forces as a whole.

Current definitions of readiness, established during the Cold War, need to be updated to address new dangers and conform with the new defense strategy and forces that have resulted from the Bottom-Up Review. One of our primary challenges, therefore, is to define readiness broadly enough to include elements of jointness and sustainability while reflecting the shifting requirements of the post-Cold War era.

Once an updated definition of readiness has been developed, we must proceed to establish:

- Clear and agreed-upon standards that specify the levels of performance our forces must be able to attain.

- Reliable measurements to assess whether current and future forces meet these standards.

- Responsive management structures to ensure that readiness receives appropriate attention within the policymaking and resource allocation processes.

Standards

Determining standards for readiness used to be easy: The Soviet Union was our principal enemy and the main readiness standard was a requirement to be able to halt an attack on Western Europe by Warsaw Pact forces. We no longer face a single potential adversary or have a familiar and long-standing scenario for which to prepare. Our forces may be called upon to fight on short notice in any of a number of locations or conditions, or they may have to be inserted into a civil conflict where they would seek to enforce a peace settlement among warring factions.

Traditionally, levels of readiness have been determined by specified metrics. We are working to determine whether existing standards could be supplemented or replaced by other standards more appropriate to the requirements of the new defense strategy.

Our broad standards of readiness should be determined by the ability of our forces to carry out our defense strategy, specifically the requirement to be

able to fight and win two nearly simultaneous major regional conflicts. Appropriate offices within OSD, the Joint Staff, the services, and the combatant commands will determine guidelines for establishing readiness standards.

Measurements

Once standards have been set, we must develop reliable measurements to help determine whether or not our forces are meeting the standards. Currently, we measure readiness either by looking at inputs, such as flying hours per month and steaming hours per quarter, or by examining outputs, such as C-ratings (measurements of equipment fill, manning, level of training, and so forth) for various units. The trouble with inputs is that they measure only the factors that contribute to readiness. Output measures are suspect because they are very subjective and are done on a piecemeal basis by different people judging disparate units using varied criteria.

Another shortcoming of the current readiness reporting system is that it scrutinizes most carefully the readiness of the front-line troops that would be called on first in a crisis, but doesn't assess the rest of the force as carefully. However, because most commanders will accept risks to some parts of the force structure in order to keep "cutting edge" combat troops at the highest readiness state, degradations in the readiness of these other components are often slow to be perceived.

While the current system of measuring readiness does not need to be abandoned, existing measures of readiness do need to be augmented with new approaches to evaluating troop performance. Not only are better measures of readiness needed at the individual and unit level, but we must find ways to evaluate the readiness of joint forces — thereby ensuring that our combat forces are adequately trained, equipped, and supported to conduct joint and combined operations ranging from smaller contingencies to major regional conflicts. These new measures must examine both inputs and outputs to watch for warning signs of decreased readiness. Some possible warning signs include:

- Increased tempos of operations for both units and individual personnel necessitated by either routine or crisis commitments.

- Transfers of funds out of readiness accounts to support unscheduled deployments.

- Decreases, cancellations, or deferrals of planned training or logistics support activities and functions.

To get a true picture of force readiness, we need to identify key indicators and use them to project or confirm longer-term trends. In that regard, we are watching existing indicators and developing new ones — especially measures that will allow us to prevent future readiness problems — to improve our ability to oversee and manage readiness. The following examples illustrate the complexities of readiness assessment and forecasting.

This spring, the national media reported that we had experienced reduced success in attaining both the desired number and quality of military recruits. A longer-term view, however, suggests that this reduced recruiting success came at the traditional annual low point in recruiting (April/May pre-high school graduation). Subsequently, our indicators have projected that FY 1993 recruit quality will remain above that of pre-Desert Shield/Desert Storm experience.

Similarly, it was reported that there had been a "reduced propensity to enlist." Taken alone, this might be seen as a problem. A more balanced view, however, must consider the impact of the force drawdown, with its associated reduced need for recruits, as well as the growing number of eligible youths in the recruiting pool. Doing so provides a more optimistic outcome.

Finally, it has been argued that readiness and training were reduced by our large-scale contingency operations in Somalia, Iraq, and Bosnia. It is certainly true that this year's operating tempo was exceptionally high. As a result, we had to divert funds from the operations and maintenance (O&M) account to support these efforts. Without timely corrective actions,

this can hurt readiness. To some extent, recovery in readiness and related accounts can be accomplished through reprogramming, as was done in this year's supplemental and reprogramming requests. However, in order to preclude, or at least to mitigate, the impact of future contingency operations on readiness, the FY 1994 defense budget request included $448 million for contingency operations: peacekeeping/peace enforcement, humanitarian assistance, democracy building, and disaster relief.

By expanding and improving our measures of readiness, in line with standards agreed upon by OSD, the CINCs, and the services, we can get a better appreciation of the status of our forces, and what supplemental steps are needed to maintain their readiness.

Management

The last step in the process of improving our means of maintaining high combat readiness is the creation of management structures within DoD that ensure that readiness concerns permeate all levels of decision-making.

First, there must be no doubt that preserving readiness is the cornerstone of our new defense strategy. The Clinton Administration and its defense team have made maintaining forces ready to fight the number one defense priority. This emphasis will be reflected, for example, in the Defense Planning Guidance and other key DoD planning and programming documents. These documents direct the services, which have principal responsibility for readiness, to make combat readiness the first priority in their programs and budgets.

In addition, several organizational initiatives related to readiness are underway. The OSD staff is being reorganized to create a new Assistant Secretary for Personnel and Readiness. This position will provide a single focal point for overseeing all aspects of readiness. There are also three readiness committees that have been formed to examine different aspects of the issue.

• **Senior Readiness Council.** This senior-level forum is chaired by the Deputy Secretary of Defense and includes the Vice Chairman of the Joint Chiefs of Staff and the service chiefs, with the Assistant Secretary of Defense for Personnel and Readiness serving as Executive Secretary. The group was created to bring together the key military leaders who are responsible for advising the Secretary and the Deputy Secretary of Defense on readiness policy. Specifically, the group will be attempting to link near-term considerations with longer-term programs and to alert OSD to any critical readiness problems that may occur. The panel will receive and consider recommendations made by the Readiness Task Force and the Readiness Working Group (discussed below), and other sources.

• **Readiness Task Force.** This group, operating under the Defense Science Board and headed by General Edward C. "Shy" Meyer (USA-Ret.), consists of eight retired general and flag officers. It was created to provide the Secretary and Deputy Secretary of Defense expert outside advice and alert them to critical readiness issues. The Meyer panel will meet as required and periodically visit units in the field in order to develop insights on readiness matters and provide recommendations to the Secretary. It will focus on establishing key readiness indicators — especially those that provide early warning of future problems — and alerting the Secretary and the Senior Readiness Council to critical readiness concerns it may identify.

• **Readiness Working Group.** This group, to be chaired by the Assistant Secretary of Defense for Personnel and Readiness, will include senior representatives from the Joint Staff, the services, and offices within OSD. It will be the primary forum in DoD for raising, discussing, evaluating, and recommending solutions to readiness issues. The Readiness Working Group will also be responsible for overseeing the implementation of readiness initiatives, programs, and decisions. The group will charter studies of readiness issues, ensure that DoD readiness goals are met, convey the Secretary of Defense's readiness decisions throughout the department, and develop and use readiness early-warning indicators to alert DoD and advise the Secretary on readiness-related issues.

Funding Issues

Despite the promise of these new standards, measures, and organizations, without adequate funding, readiness will decrease. Too often in the past, readiness has suffered when increased operating tempos, caused by crisis responses around the globe, have forced the services to draw from the same operations and maintenance accounts that fund readiness. In the first years of the post-Cold War era, we have already been involved in many such operations, from peacekeeping and peace enforcement to humanitarian assistance and disaster relief.

This is especially true in the case of smaller-scale operations where reimbursements from other sources — whether contributions from coalition partners or a supplemental appropriation from Congress — are not readily available. Frequently, when reimbursements to the services have been received, they have come after decreases in readiness — as a result of missed training or deferred maintenance — have already occurred.

The establishment of a special peacekeeping account in the FY 1994 budget to fund U.S. commitments to such operations will help to avoid siphoning off O&M funds needed for readiness. However, this fund is insufficient to support larger, long-term deployments of U.S. forces to these operations. In the future, DoD will press to get such contingency operations funded through supplemental budget requests as rapidly as possible.

FAIRNESS TO PERSONNEL

People are at the heart of our armed forces. The best planning, the highest-technology weapons, and the most well-conceived strategy will have no impact if the military personnel upon whom the planning, weapons, and strategy depend are not fully motivated and trained.

In order to meet Cold War threats, we created the most highly professional, trained, and motivated force in the world. The results of those efforts were clearly seen in the overwhelming victory achieved in Operation Desert Storm. To meet the new dangers and seize the new opportunities of the post-Cold War environment, we need to maintain those qualities in our people.

During this era of shrinking budgets and force reductions, we have a responsibility to those individuals remaining in the military to maintain their quality of life and to ensure that they retain the high level of professionalism they have worked so hard to attain. We also have a responsibility to treat fairly and ease the transition of those who will be leaving the military, as well as the people and communities who supported our forces—from defense workers to the communities losing bases or defense plants.

Our Commitment to People in the Force

Our first challenge as we reduce the size of our defense structure is to make sure that our military remains the most dedicated and professional in the world. With the range of activities that America's armed forces will be involved in, it is more important than ever that we provide the full range and quality of support, training, and education that our troops need. In order to meet this challenge, DoD will pursue the following objectives:

• ***Maintain high recruit quality.*** We must continue to ensure that we recruit the best young men and women we can for our armed forces. Thus far, the services have continued to meet their recruiting objectives with top-notch people, although educational achievements of incoming personnel have declined slightly from the unprecedented highs of the past few years. Somewhat worrisome is the fact that some surveys indicate that interest in joining the armed forces is beginning to decline among America's youth. This appears to be due, in part, to the uncertainty they perceive as to the long-term viability of a military career. We plan to take steps to halt both these trends. Two steps that will help are to provide adequate funding and support for our advertising and enlistment bonus programs so that they continue to work effectively.

• ***Successfully implement social changes.*** Our armed forces will be going through significant social changes as we seek to expand the number and types of opportunities available to service women and to implement President Clinton's decision on homosexuals in the military. We must implement these new policies in a careful, practical, fair, and consistent way, while preserving the current high levels of combat effectiveness and unit cohesion in our armed forces.

• ***Maintain the quality of life of our military personnel and their families.*** Our ability to attract and retain high-quality men and women in the armed forces will be heavily influenced by our ability to provide a military lifestyle that encourages talented people to join and remain in the military. To achieve this goal, we are implementing a proactive, "people first" strategy. We must provide adequate compensation, benefit levels, and "quality-of-life" incentives, while continuing to improve our welfare and recreation activities, dependent education, child development, youth activity, and family support programs. We must also monitor the tempo of operations of our deployed forces so that our troops and their families will not be hit so hard by frequent, lengthy separations.

• ***Training.*** We must also provide rigorous, realistic, and challenging training to our troops if we are to keep their readiness high. We are determined to maintain adequate funding for field training and related programs, such as expanded use of combat simulators.

• ***Limit disruptions as the personnel drawdown proceeds.*** Perhaps our most important goal is to manage the personnel drawdown process intelligently, with as little disruption to our armed forces as possible. As the drawdown proceeds, there will inevitably be some upheavals and reorganizations. We will face a temporary increase, in the near future, in relocation moves for separated and realigned staff, but we are determined to try and minimize these moves and disruptions.

Our Commitment to People Leaving the Force

We owe a great deal to all those who have chosen to serve in the Department of Defense, and we have a responsibility to treat those who separate from DoD with the compassion and fairness they deserve. Several programs are intended to minimize involuntary separations and ease any separations that must take place.

Voluntary Separation Initiatives (VSI) and Special Separation Benefit (SSB) Programs. DoD ended FY 1992 with an active-duty military end-strength some 17 percent, or 366,000, below the peak end-strength of 2,174,000 in FY 1987. We must still draw down by approximately 400,000 more people, to 1.4 million by FY 1999. Until now, most of the reductions have been achieved by attrition, reduced accessions, and our very successful voluntary separation programs. More than 22,000 service members have already applied for separation under the VSI and SSB programs this year; this is more than half of our FY 1993 goal of 30,000. We will continue to use these programs wherever possible to achieve further necessary personnel reductions.

Early Retirement Authority. While the VSI and SSB programs are working well for members with 6 to 15 years of service, these programs have not induced large numbers of DoD personnel with more than 15 years of service to separate. Temporary early retirement authority will complement other programs and help us shape the 15- to 20-year segment of the force. The goal of this program is to supplement the voluntary separation programs so that our forces can maintain an appropriate mix of skills and experience as they are reduced in size. The temporary early retirement program will help reduce those overstrength skills, grades, and year groups and minimize involuntary separations.

Reserve Component Separation Initiatives. The reserve component transition initiatives enacted by the Congress and implemented by DoD include special separation pay for those with more than 20 years of service, early qualification for retirement pay (at age 60) for those with 15 to 20 years' service, separation pay for those with 6 to 15 years of service, post-separation use of commissaries and exchanges, continuation of Montgomery G.I. Bill educational assistance, and VSI/SSB and temporary early retirement programs for selected full-time reservists.

Civilian Separation Incentives. Like our plans for active military and reserve personnel separations, plans for civilian separations will minimize involuntary departures. DoD intends to reach the civilian reduction level first by attrition, then by using the authorized buyout provisions recently passed by the Congress, and last, by involuntary separations. We will also continue to adhere to civilian hiring restrictions already in place, replacing two civilian employees for every five employees who leave.

Transition Assistance Programs. There are other programs being undertaken to ease the transition for personnel leaving DoD:

• ***Extended medical care.*** We will pay the government portion of health insurance premiums for an additional 18 months beyond the release date of employees who are involuntarily separated.

• ***Separation assistance counseling.*** There are several programs available to help departing DoD personnel find new jobs. The Verification Program provides a form with a service member's military experience, training history, associated civilian-equivalent job titles, and educational credit information. Another automated program registers mini-resumes of civilian employees, military members and their spouses in the Defense Outplacement Referral System. Through this program, the Department, in cooperation with the Office of Personnel Management, refers the resumes of DoD personnel to federal and other public and private-sector employers. The Defense Priority Placement Program (PPP) remains the backbone of our internal civilian placement efforts, providing fine-tuned PPP policies that are responsive to employee needs. Registrants in this automated program average about 7,000 per month, and we place approximately 500 employees monthly. To accommodate the transition needs of individuals stationed overseas, DoD has sponsored job fairs in Europe and Asia.

• ***Relocation assistance.*** This is a Congressionally-directed program that operates through the family centers at military installations. It provides planning assistance, community information, and emergency aid during the relocation process.

• ***"Soft landings" for troops.*** To address the transition needs of military personnel, DoD civilians, and defense contractors and, at the same time, place talented individuals in public service jobs, we are establishing a program to encourage separated individuals to go into teaching, law enforcement, health care, and environmental restoration and preservation. We are also establishing a public and community service jobs registry containing both resumes and job vacancy notices.

• ***Retraining.*** DoD is helping displaced military, civilian, and contractor personnel prepare for new employment by working with other federal agencies to provide employment and retraining services.

• ***Department of Veterans Affairs.*** We have also provided significant funding to the Department of Veterans Affairs to implement the Service Members Occupational Conversion and Training Act, which will provide training to veterans in need of additional civilian job skills.

Assistance to the Larger Defense Community

We have established the Defense Reinvestment Initiative to aid the people and communities that have long supported our national defense but are now losing defense facilities in their area. This initiative, in conjunction with others from DoD and other government agencies, will help affected communities adjust to the defense drawdown.

Base Closure and Redevelopment. DoD is working with the Commission on National and Community Service to explore how the Civilian Community Corps can assist us in addressing the needs of communities where bases are being closed. Examples might include (nontoxic) environmental base cleanup activities, installation maintenance, conservation programs, and wildlife protection.

Continued Commitment to Society. To further address the school dropout problem, the Department will fund a Civilian Youth Opportunities pilot program, administered by the National Guard. The program will provide military-based training and community service opportunities to improve the life skills and employment potential of youth who drop out of school. We also are implementing a pilot program through the National Guard to provide health care services to medically underserved communities and populations. DoD has doubled the size of the Junior Reserve Officers Training Corps (JROTC) program, which uses retired defense personnel to teach leadership, citizenship, and responsibility to high school students. Combining JROTC instruction with vocational training and academic instruction, we have developed the JROTC Career Academy Program directed toward at-risk youth in inner-city high schools.

Demonstration Programs in Job Development. DoD is working with the Department of Labor to assist

employees adversely affected by base closures and realignments and contractor cutbacks. We have transferred $100 million of the $150 million authorized to the Department of Labor for the Defense Conversion Adjustment Program to help displaced defense workers prepare for and find new jobs, and to provide them with relocation and other support services, such as transportation and child care. In addition, three base closure locations (Castle Air Force Base, Philadelphia Naval Shipyard, and Williams Air Force Base) were among 12 locales awarded demonstration grants to provide job development and job search services beyond those traditionally available through the Labor Department program.

Defense Diversification Program. Additional funds, authorized and appropriated in FY 1993, have been transferred to the Department of Labor for an expanded assistance initiative, called the Defense Diversification Program. New provisions include access to training assistance 24 months in advance for DoD civilians at bases slated for closure and needs-related stipends for displaced defense workers while on training.

Department of Commerce. The Department also transferred $50 million appropriated in FY 1991 and $80 million appropriated in FY 1993 to the Economic Development Administration of the Department of Commerce to help communities implement their adjustment plans.

SECTION VII: DEFENSE FOUNDATIONS

ROLES AND MISSIONS

To ensure that our armed forces are properly aligned to meet future challenges, we must continually evaluate the division of labor — the allocation of roles, missions, and functions — among the services and combatant commands.

This section describes the Bottom-Up Review of:

- ***Roles.*** The broad and enduring purposes for which the military services were established by Congress in law;

- ***Missions.*** The tasks assigned by the President or Secretary of Defense to the combatant commanders; and

- ***Functions.*** The specific responsibilities assigned by the President or the Secretary of Defense to enable the services to fulfill their legally established roles.

The Goldwater-Nichols Department of Defense Reorganization Act of 1986 requires the Chairman of the Joint Chiefs of Staff (JCS) to "periodically recommend such changes in the assignment of functions (or roles and missions) as the Chairman considers necessary to achieve maximum effectiveness of the Armed Forces."

In March, Secretary Aspin forwarded to the Congress the Chairman of the Joint Chiefs of Staff's *Report on the Roles, Missions, and Functions of the Armed Forces of the United States* — the second such version of that report since Goldwater-Nichols became law. In his letter transmitting the report and in a subsequent directive issued throughout DoD in April, the Secretary provided his decisions on the Chairman's recommendations. Within OSD, the services, and the Joint Staff, 31 working groups were formed to implement the Secretary's decisions. Deliberations commenced immediately. In most cases, 60-day implementation plans or 90-day "fast track" study results were forwarded to the Secretary to keep him apprised of progress on the actions.

The most encompassing action taken — one which has broad implications for the conduct of evolving, post-Cold War missions such as peacekeeping — involves placing the majority of U.S.-based forces, including the Atlantic Fleet, Forces Command, Air Combat Command, and Marine Forces Atlantic, under a single, unified combatant command. The U.S. Atlantic Command was selected because it is particularly well-suited to assume this new mission. The principal purpose of the new command is to ensure joint training and readiness of forces stationed in the United States. As a result of this change, forces would already be accustomed to operating together and could therefore be deployed efficiently to overseas locations when crises arise. Consequently, overseas CINCs will be able to focus more on in-theater operations and less on deployment readiness concerns.

In addition to developing jointly trained forces, the U.S. Atlantic Command would be assigned other important new functional responsibilities:

- Supporting U.N. peacekeeping operations and training units for that purpose.

- Assisting with disaster relief operations in the United States and fulfilling other requirements for military support to civil authorities when requested by state governors and as directed by the President.

- Planning the land defense of the United States.

- Improving joint tactics, techniques, and procedures.

- Recommending and testing joint doctrine.

Depot maintenance represents another area examined in the most recent Roles and Missions Report

where important follow-on work is underway to eliminate redundancies. Government depots comprise a huge organization of some 130,000 civilians and 2,000 military personnel spread across 30 facilities. Today, with the ongoing reductions in the U.S. force structure, DoD's depot capacity exceeds requirements by 25 to 50 percent. The Base Realignment and Closure (BRAC) Commission recommended closing seven depots and realigning three others. A DoD working group is reviewing additional consolidations and new management schemes. The goal is to reduce depot capacity significantly so as to align it more closely with our reduced force structure and overall requirements.

Another action resulting from the Roles and Missions Report and the Secretary of Defense's directive is the establishment of an Executive Agent management structure for DoD's vast training, test, and evaluation (TT&E) establishment. The services have agreed to pool their TT&E infrastructures and resources under a joint board of directors comprising senior officers from the four services. This action will streamline and vastly improve the efficiency of this large complex of facilities and ranges.

The April directive also identified five areas for further study in conjunction with the Bottom-Up Review (four of which are addressed in this section):

- Expeditionary ground force roles and requirements.
- Service air power roles and force requirements.
- Service contributions to meeting overseas presence needs.
- Service responsibilities in new mission areas, such as peacekeeping.
- Responsibilities assigned to the active and reserve components (examined in the next section).

In each of these areas, the focus was on preserving the benefits that derive from competition among the services, while eliminating unnecessary and duplicative practices. As Secretary Aspin and the Chairman of the JCS have both stated, fielding unique but complementary capabilities in different military services can be an efficient use of resources. It may be necessary to assign a particular function to more than one service in order to ensure that critical capabilities are available when and where they are needed. Moreover, cross-service diversity can foster greater innovation, seriously complicate enemy planning, and hedge against possible breakthroughs in countering a particular capability.

The Bottom-Up Review determined that it is necessary to maintain multiservice capabilities in all of the areas listed above. However, where those capabilities involve the use of similar weapon systems or platforms, special attention must be given to ensuring that the services adopt common approaches, to the extent possible, in several areas. These include:

- Developing standard tactics and techniques, adopting common doctrinal approaches, and carrying out joint training where coordination with other force elements is required.
- Consolidating support and training infrastructures to reduce excess capacity.
- Exploiting opportunities to develop and field common weapon systems and subsystems.

Expeditionary Ground Forces

As was discussed in Section IV, the Bottom-Up Review assessed a number of alternative force mixes weighted toward ground, sea, or air components, but validated the need for a balanced force that is highly responsive to a broad array of possible contingencies.

The review of expeditionary ground force requirements included the full range of contingency and expeditionary forces: active Army heavy (armor and mechanized), light, and specialized airborne and air assault forces; all Marine Corps forces, including the organic contributions of the Marine air component; and special operations forces. These forces were

examined for their contributions under a range of circumstances and conditions.

Under our proposed defense strategy and force structure, expeditionary ground force capabilities appear sufficient for any single contingency, large or small. However, if we had to deal with more than one contingency at a time, such a scenario would place extraordinary demands on certain elements of the force, such as Army airborne and air assault forces, Marine expeditionary forces, and some special operations forces.

Smaller-scale operations also place special requirements on "light" forces and on special operations forces. Threat and terrain conditions and the lack of available infrastructure often exclude the use of armor or mechanized forces in such circumstances. So-called light forces (Army infantry, airborne, and air assault) and medium forces (Marine air-ground task forces) may be required to perform a variety of functions, including forcible entry, assuming access is contested. For contingencies extending over lengthy periods of time, consideration must also be given to providing an adequate rotation base. Reserve component forces might be called upon in these situations.

Adoption of new missions such as peacekeeping, humanitarian assistance, and disaster relief, or a significant expansion of existing missions such as increased amphibious ready group presence in maritime regions, has the potential to place far greater demands on the operating and deployment tempos (time deployed) of our forces. Combat force contributions to peacekeeping operations, for example, will in most cases be infantry and SOF-intensive and will likely involve force commitments of an extended duration. However, planned reductions in light infantry forces and rotation factors will limit the size and number of commitments these forces can support. Moreover, once committed to peacekeeping operations, these forces will not be readily available to respond to crises elsewhere. Again, we are exploring greater use of reserve component forces as a means of relieving the burden on our active forces and increasing our flexibility to perform such operations.

Theater Air Operations

The Bottom-Up Review's assessment of theater air operations drew heavily on Joint Staff analyses exploring the contributions of various service air components under a variety of scenarios and circumstances. However, some independent modeling was conducted within OSD which looked specifically at the capabilities of modern munitions against large armored forces.

As with ground force operations, theater air operations require a careful sequencing of forces in the early stages of conflict. If control of airspace is contested, air superiority must first be established. When airspace is contested in maritime areas or when air bases ashore are not available, Marine and Navy fighter aircraft play a crucial role. In certain circumstances, Marine and Navy air elements, along with long-range bombers, will be the only sources of theater air power available. In contingencies where access to local land-based facilities is well assured and logistics support can be maintained, land-based air-superiority aircraft will combine with Navy and Marine tactical aircraft to provide the most capable mix of forces possible. Joint Staff war-gaming analysts explored air-superiority requirements against a variety of potential threats. In all cases, land- and sea-based air-superiority aircraft were found mutually supportive and necessary.

Interdiction operations and attacks on strategic targets could begin almost immediately with long-range missiles, stealth aircraft, and aircraft capable of delivering standoff weapons. Once air superiority was assured, emphasis would be placed on interdiction efforts. Strike platforms from all services would contribute, adding confusion to enemy planning and overwhelming remaining enemy air defenses. Bombers could play especially important roles in the early stages of a conflict, once outfitted for delivery of precision-guided munitions.

Engaged ground forces will require close air support. Air Force, Navy, and Marine fixed-wing attack aircraft and Army and Marine attack helicopters will provide this support. In implementing another recommendation of the recent Roles and Missions Report,

joint doctrine is being updated to better account for the contributions of attack helicopters. Work must continue in the area of integrating long-range rocket artillery fire with air-delivered munitions.

The danger presented by the proliferation of weapons of mass destruction, particularly nuclear weapons, places additional demands on theater aviation. First, development of conventional counterforce capabilities will be necessary. Second, while we believe the Navy and Marine Corps can prudently do away with the tactical nuclear mission of their air components, a limited number of Air Force multirole aircraft must remain capable of delivering theater nuclear weapons.

One other promising change in the area of theater aviation is the integration of Navy and Marine Corps fixed-wing fighter/attack aircraft. Three Marine Corps F/A-18 squadrons and one EA-6B squadron will participate in aircraft carrier deployments. We will also examine further integration of Marine Corps fighter/attack squadrons in support of carrier operations, while ensuring that such integration does not disrupt the integrity of the Marine air-ground task force concept.

On the programmatic side of theater air operations, the Bottom-Up Review analyzed the potential for joint Air Force-Navy development of single aircraft types and components to meet the requirements of both services at substantial cost savings. As a result, the Joint Advanced Strike Technology Program has been launched with the aim of achieving far greater commonality of components and "jointness" in the next generation of Navy and Air Force strike aircraft.

While it is clear that all services will retain important air power roles, more work must be done to ensure that air and missile contributions are better integrated. This will remain a critical area for ongoing analysis.

Overseas Presence

Overseas presence requirements are apportioned among the services according to the needs of regional commanders. Given the diversity of situations and locations where U.S. interests are represented in peacetime, multiservice capabilities are crucial to maintaining adequate overseas presence as the overall size of our force is reduced.

Throughout the Cold War era, land-based ground and air forces constituted the majority of U.S. forces stationed overseas. Guided by a strategy of forward defense and containment, these forces were deployed in significant numbers and were supported by a relatively large forward base infrastructure.

Today, our overseas presence is both declining and being restructured in response to the changed strategic environment. In some regions, such as Europe, our land-based presence, both troops and bases, is declining sharply. In other regions, like the Pacific, where we had fewer forward-stationed forces to begin with, the decline is less dramatic. In still other regions, such as the Persian Gulf, the post-Cold War period has brought with it more, not fewer, demands for presence.

The decline in the number of U.S. forces permanently stationed abroad and the accompanying drawdown in bases and facilities to which we have historically had access means that our remaining overseas presence forces and facilities take on added significance in implementing our regionally-oriented defense strategy.

We will continue to examine innovative concepts to fulfill our commitments as we reduce our overall overseas presence, ensuring, for example, that increased operating tempos and a shrinking rotation base do not degrade combat readiness. A number of these concepts — including a reserve/training carrier, adaptive and joint force packages, and combined exercises of land, air, and naval forces with U.S. friends and allies — have already been discussed. Over time and in consultation with our friends and allies, adjustments will continue to be made in our overseas presence that recognize the limitations of a smaller U.S. force structure while continuing to serve our interests abroad.

Service Roles in New Mission Areas

Peacekeeping, peace enforcement, humanitarian assistance, and disaster relief operations place new demands on U.S. armed forces and require some redefinition of missions and functions, with an attendant impact on resource allocation. Of these potential missions, peacekeeping and peace enforcement operations will be the most demanding. Here again, the flexibility of complementary, multiservice capabilities is a tremendous asset.

As noted earlier, one prominent step in our response to this new requirement has been to make the U.S. Atlantic Command responsible for evaluating and refining joint and combined doctrine for peacekeeping and other peace support operations and for developing joint training programs and exercises. In terms of the distribution of other roles and missions, the military services will retain responsibility for individual and unit training and general leadership preparation for peace support operations, while regional commanders will be responsible for operational and contingency planning.

Force planning and the associated force structure for peace enforcement operations will resemble those for major (or lesser) regional conflicts, as was discussed in Section III. Peace enforcement is a form of armed combat requiring tailored forces from all components, as determined by a regional commander. Service functions in these types of operations will differ little from those required for other combat operations.

Planning for peacekeeping requires different techniques and a different mix of combat and support forces. Effective multinational staff and leader training and familiarity with certain noncombat techniques (such as negotiation and integration of nongovernmental and private volunteer organizations into the overall effort) will be critical to the outcome.

Peacekeeping operations typically will also require heavier concentrations of combat support and combat service support forces than is the case for combat operations. Emphasis will be placed on medical, engineering, transportation, and command and control capabilities. Depending on the anticipated level of U.S. participation in peacekeeping operations, the mix of active and reserve forces in these areas may need review.

Combat forces for peacekeeping will usually include both ground and air components, as well as maritime forces if blockades are to be enforced or naval interdiction is required. Ground forces will likely be infantry-intensive, depending upon the scenario, and could, in some cases, severely strain overall "light" force capabilities. Air contributions will mostly involve supply and reconnaissance assets. As a follow-on to the Bottom-Up Review, we will continue to evaluate overall force requirements for peace support operations.

A Concluding Comment

The Bottom-Up Review has provided an important opportunity to further clarify service roles, missions, and functions in selected areas and, therefore, build on the recommendations of the Roles and Missions Report. In each of the five areas examined, the need for multiservice capabilities was reaffirmed. However, several important matters raised in the Bottom-Up Review will require further attention as the process of defining America's post-Cold War security needs continues in the months ahead.

SECTION VII: DEFENSE FOUNDATIONS

RESERVE COMPONENT FORCES

Reserve component forces are an integral part of our armed forces and are essential to the implementation of our defense strategy. Reserve forces were key to our success in the Persian Gulf war, clearly demonstrating their commitment, dedication, and professionalism. After Iraq's invasion of Kuwait, reserve volunteers from all of the services were among the first military personnel to deploy — literally thousands of reservists volunteered to be activated in the initial days of the operation. The Persian Gulf War, which required the largest mobilization and deployment of the reserve component since the Korean conflict, was also the first major test of our Total Force policy, instituted in 1973 to integrate the active and reserve components of our armed forces more closely with one another.

Since the inception of the Total Force policy, our National Guard and reserve forces have been sized and structured in much the same way as our active forces — which, during the Cold War years, required that they be able to meet the demands of a global conflict with the Soviet Union and the Warsaw Pact. During the 1980s, major improvements were made in the readiness of reserve forces for wartime missions. The reserve component structure also was expanded significantly — the Selected Reserve (those units and individuals within the overall Ready Reserve structure designated as essential to wartime missions) increased by some 35 percent, to 1,150,000 personnel from 850,000.

Adapting the Reserve Components to Address New Dangers

Today, new regional dangers have replaced the global Soviet threat and, as with our active forces, we must adapt the reserve components to meet these new challenges. Our approach is to seek "compensating leverage"; that is, to use the reserve components to reduce the risks and control the costs of smaller active forces. Compensating leverage does not mean maintaining larger Guard and reserve forces. Rather, it means making smarter use of the reserve component forces that we have by adapting them to new requirements, assigning them missions that properly utilize their strengths, and funding them at a level consistent with what will be expected of them if we have to use them during a crisis or war.

One of the most important tasks is to define explicitly the roles and missions we expect the reserve components to perform in the new security environment. During regional contingencies, Guard and reserve forces will continue to provide — as they have in the past — significant support forces, many of which would deploy in the early days of a conflict. Reserve component combat forces will both augment and reinforce deployed active forces and backfill for active forces deployed to a contingency from other critical regions.

Guard and reserve forces also will help promote international stability and security during peacekeeping, peace enforcement, and humanitarian assistance operations. Missions appropriate to the reserve components include support for active forces engaged in such operations, including strategic airlift, service support, civil affairs, and other capabilities. During prolonged operations, or when active forces redeploy during a major regional conflict, reserve forces are available to provide a rotational or replacement base.

Finally, the Army and Air National Guard will continue to serve as the first line of defense for domestic emergencies. They will provide forces to respond to natural disasters, domestic unrest, and other threats to domestic tranquility. They also will provide air defense of the United States and protect U.S. airspace sovereignty.

In some areas, the reserve component force structure is well suited to future needs. In others, too much force structure exists and organizations are not prop-

erly organized, trained, or equipped to undertake new missions. Described below, for each of the services, are the changes we intend to make in the reserve components to adapt them to the new environment.

Air Force Reserve Forces

Increased investments in the Air Force Reserve and the Air National Guard during the last two decades have produced forces able to meet the demanding missions given to them. All of the roles already assigned to the Air Reserve components, from aerial refueling to airlift to air combat, are well suited to our future needs. We also intend to assign new or expanded roles to the Air Reserve components in several important areas. At the same time, the end of the Cold War has made necessary some reductions in these force elements.

The Air National Guard will assume a larger share of the air defense mission in the United States, including manning and operating 1st Air Force Headquarters and all U.S. regional and sector operations centers. The total number of Air National Guard air defense interceptor squadrons and aircraft will be reduced in light of the virtual elimination of the long-range bomber threat.

Air National Guard and Air Force Reserve units will also assume an increased share of aerial-refueling and airlift operations — a task they have performed so well in past operations, like Desert Shield/Desert Storm. Also, for the first time, B-52 and B-1 heavy bombers will be transferred to Air National Guard and Air Reserve units. Finally, both the Air National Guard and the Air Force Reserve will undertake occasional short-duration peacetime fighter deployments overseas to help reduce personnel demands on the active Air Force and to meet surge requirements.

Finally, there will be reductions in Air Reserve component fighter wings. As a result of the Bottom-Up Review, it was determined that 20 fighter wings would be required to fight and win two nearly simultaneous major regional conflicts. This allows for a significant reduction in the total number of U.S. fighter wings from the Cold War level. At the same time, peacetime presence needs, including an active rotation base, require us to maintain a minimum of 13 wings in the active force. Thus, the active Air Force will be reduced from 22 general purpose fighter wings in 1991 to 13 wings, and the reserve force will be reduced from 12 to seven wings, along with a restructuring and reduction of selected support elements. The resulting active-reserve mix will help reduce costs while maintaining adequate levels of readiness, overseas presence, and warfighting capability across the entire Air Force.

Naval Reserve Forces

The Naval Reserve has many units that simply are not needed for regional contingencies. During the Cold War, a substantial number of Naval Reserve ship augmentation units were maintained to increase manning to wartime requirements and to replace battle casualties. Now that new technology has automated many ship functions and the threat posed by a blue-water Soviet navy has disappeared, these requirements have declined significantly.

Some units will be reoriented to missions that support a high tempo of peacetime naval operations, while providing a surge capability to augment the active force during contingencies. The resulting Naval Reserve will be smaller, more specialized, and more immediately effective in responding to a range of potential operations, including the needs of two nearly simultaneous conflicts.

The demanding peacetime tempo of naval forces means most ships must be manned by active-duty crews. Ships will be placed in the Naval Reserve Fleet (NRF) where the need for a high tempo of peacetime operations is limited. For example, we will be substantially increasing the Naval Reserve's role in mine warfare by placing additional minesweepers and mine countermeasure ships in the Naval Reserve Fleet. We

also expect to retain about ten frigates (FFG-7s) in the NRF.

In addition, we are proposing a major innovation in the force structure for Naval Reserve ships — placing an aircraft carrier in reserve status. In peacetime, this carrier, with a largely full-time crew, would conduct training missions for active and reserve aviators, and could be available for limited deployments overseas. In a war that called for a very large force and mobilization, the reserve carrier and its air wing could be deployed to a conflict theater relatively expeditiously.

A single reserve carrier air wing composed of Navy and Marine Corps squadrons will be created. The Naval Air Reserve will also have significant responsibilities in the areas of antisubmarine warfare and countermine operations. For example, the Navy intends to integrate active and reserve mine countermeasure helicopter squadrons.

Marine Corps Reserve Forces

The Marine Corps Reserve is a relatively small force — representing only 19 percent of total Marine Corps end-strength. It is characterized by high prior-service officer accessions and the integration of Marine Corps Reserve combat units at the smaller unit level. Such characteristics have given the Marine Corps Reserve an ability to deploy and integrate itself effectively with active forces with minimal "train-up" time following mobilization. For example, during Operation Desert Storm, more than 50 percent of the Marine Corps Reserve was activated and employed, including some two-thirds of the reserve combat structure.

Marine Corps Reserve forces, which have long been designed and structured to augment and reinforce expeditionary operations in distant regions, are well suited to the challenges of the post-Cold War era and require only limited changes in their composition. We plan to retain a Marine Corps Reserve end-strength of about 42,000, slightly larger than planned under the Base Force, to ensure that the Marine Corps Reserve can fulfill both its augmentation and reinforcement roles.

Army Reserve Component Forces

Achieving an Army total force capable of meeting new security requirements demands adapting the Army National Guard and the Army Reserve to the new defense strategy, improving and accelerating the process of readying combat forces for deployment, and utilizing the Army Guard and Reserve in areas where they have performed effectively and responsively in the past. Currently, there are about 700,000 personnel in the U.S. Army Reserve and National Guard. As the reserve structure is realigned to support the new defense strategy, end-strength in the Army reserve components will decline to about 575,000 by 1999.

Support Forces. Combat support and combat service support (CS and CSS) units in the Army Reserve are able to deploy rapidly and be integrated effectively into the active force — a fact that was demonstrated clearly during the Persian Gulf conflict. Our reliance on the reserves for CS and CSS units in the future will depend on how quickly we can activate them in a crisis, as well as on the size of the residual active-duty support forces needed for peacetime missions. We plan to expand the role of Army reserve component CS and CSS units in key areas to provide additional support for Army combat units and other U.S. forces involved in combat operations.

Reorganizing the Army National Guard. The Army National Guard will transition to a combat force of about 37 brigades, including 15 enhanced readiness National Guard brigades, to execute the strategy of the Bottom-Up Review, to provide strategic insurance, and to support civil authorities. Within the overall force structure, the focus will be on the readiness initiatives directed toward the 15 enhanced readiness brigades as well as combat support and combat service

support needed to execute the strategy of winning two nearly simultaneous major regional contingencies.

The 15 enhanced readiness Army National Guard brigades will be organized and resourced so that they can be mobilized, trained, and deployed more quickly to the fast-evolving regional conflicts that we expect in the future. These brigades will be able to reinforce active combat units in a crisis. The goal is to have these brigades ready to begin deployment in 90 days.

The other Army National Guard combat forces, maintained at lower readiness, are needed as well for:

• ***Extended Crises.*** The warfighting analysis of the Bottom-Up Review focused on regional crises where an enemy invasion of its neighbor is countered by an early American response that results in a quick and decisive military victory for the United States and its allies. In cases where a large scale American deployment to a region successfully deters an invasion but requires forces to remain in place over an extended period, additional Army National Guard combat units will provide the basis for the rotational forces.

• ***Peace Operations.*** The United States should have the option to provide forces to engage in peacekeeping or peace enforcement when it is in the country's interest. Generally, active duty forces would be used in the initial stages of such operations. Protracted commitments to peace operations could lower the overall readiness of U.S. active duty forces over time, and in turn, reduce our ability to fulfill our strategy to be able to win two nearly simultaneous major regional conflicts. To avoid such a path to decreased readiness, the Army Guard and Reserve forces must be prepared to share the burden of conducting these operations.

• ***Deterrent Hedge.*** The collapse of the Soviet Union has greatly reduced the imminent threat to U.S. vital interests in Europe and the Far East. The reduced threat has permitted the Defense Department to make significant reductions in force structure and military end-strengths of the Total Force (both active and reserve). However, it remains prudent to maintain a hedge against the possible failure of democratic reforms in Russia, Ukraine, and elsewhere in the world. The additional reserve component force structure provides a hedge that could form the basis of an expanded American force structure and serve as a deterrent to future adversarial regimes that could threaten U.S. interests.

• ***Domestic Missions.*** In addition to the defense missions discussed above, Army National Guard and reserve forces are called upon to meet domestic dangers such as natural disasters and civil unrest. Substantial numbers of reserves must be available during both peacetime and wartime to support civil authorities in responding to domestic crises. The Army National Guard and reserve force structure provides added capability to respond to external conflicts and to support civil authorities at home.

Readiness and Training Initiatives

A series of readiness and training improvements is necessary to ensure that the reserve components are able to meet the demands of the new defense strategy. Improvements are particularly necessary in the Army because of the demanding roles that Army National Guard and Army Reserve forces may be called upon to perform.

During the Persian Gulf War, several National Guard brigades were mobilized, but the needed post-mobilization training of those brigades was not accomplished as quickly as had been hoped or expected. Important lessons about readiness and training were learned from this experience.

Following the Gulf War, the Army's active and reserve components initiated a series of efforts reflecting the experiences of that conflict — the Army's Bold Shift program, the Army National Guard's Project

Standard Bearer, and the Army Reserve's Project Prime. Title XI of the 1993 Defense Appropriations Act added a series of requirements to further improve the deployability of individual Guard members, to sharpen the emphasis on unit and leadership training in the National Guard, to strengthen the capability assessments of National Guard units, and to increase the compatibility of active units with Guard units.

To help ensure that Guard and reserve units can indeed be available when we plan for them to be, we will be continuing a number of initiatives and undertaking some new ones to alleviate deficiencies in Guard and reserve training and combat readiness that were identified during the Persian Gulf War.

• ***Reserve equipment initiative.*** Adequate equipment is a crucial part of readiness. We will formulate our plans and budgets in order to fulfill the reserve components' legitimate equipment needs — in the Army and the other services as well. The Department will develop a balanced program of new procurement and redistribution to provide needed equipment.

• ***Full-time support for the Army Reserve.*** We are increasing the percentage of full-time support personnel in the Army Reserve component. These personnel perform key support functions — administration, maintenance, and so forth — enabling reserve personnel to focus their limited training time on required military skills.

• ***Pre-mobilization preparations.*** On strategic warning, several measures can be taken to improve the readiness of combat forces without mobilizing them. These include filling equipment shortfalls, completing school training of all personnel, providing two weekends of drill training per month, and providing a two- to three-week training period after six months.

• ***Post-mobilization training.*** Currently, only the National Training Center and a few other sites are able to provide post-mobilization training to National Guard combat brigades, if such training is needed. This limits our ability to call up and train more than a few brigades in a crisis. The Army, recognizing this deficiency, is creating several "readiness divisions" to assist with the training of reserve component units during peacetime and crises. These divisions will contain active Army, Army National Guard, and Army Reserve personnel, and will provide the peacetime and post-mobilization training assistance needed by reserve component combat and support units.

Army Guard and Reserve units must be trained and ready to fight when called to active duty. The initiatives and restructuring we are proposing are designed to ensure that is the case. After these initiatives have been implemented and in place for some time, they will need to be evaluated carefully to determine whether the readiness achieved is satisfactory or further improvements are needed. We will also need to continue to evaluate the reserve component structure against evolving warfighting requirements.

Making the Force More Accessible

As DoD becomes more reliant upon the contributions of the reserve components, ensuring better access to Guard and reserve forces takes on increasing importance. Our concerns span the entire spectrum of needs: wartime contingencies, domestic emergencies, and peacetime operations.

We are examining the adequacy of existing legislation and have submitted a request for two changes to Title 10, USC 673b. We have asked the Congress to amend that provision of law to give us access to the reserve component for 180 days plus an extension of an additional 180 days, versus the 90 + 90 days provided under current law. We have also asked that the Secretary of Defense have the authority to call up 25,000 people if needed to support deployment operations during the early stages of a conflict.

The Department of Defense has formed a Reserve Component Accessibility Steering Group which will identify and develop solutions for a full range of accessibility issues: legislative and regulatory changes; mobilization policy guidance; better ways to use volunteers; and methods to meet domestic mission needs more effectively. In addition, accessibility for domestic missions of National Guard forces could be improved by implementing recent proposals for bilateral and multilateral agreements for cooperation among states.

Our ultimate objective, of course, is to assure the availability of reserve component forces when needed, while ensuring that we do not overextend our call on our citizen-soldiers.

INFRASTRUCTURE

Infrastructure is the foundation upon which our military strength is built. It includes all DoD activities other than those directly associated with operational forces, intelligence, strategic defense, and applied research and development.

For example, in FY 1994, infrastructure activities will account for $160 billion in appropriated and revolving funds, or approximately 59 percent of DoD total obligational authority.

Infrastructure activities fall into seven broad categories:

- ***Central Logistics*** — includes depot maintenance, supply operations, and transportation. This is the largest functional area.

- ***Central Medical*** — includes all DoD medical activities except those directly associated with the readiness mission. CHAMPUS and the military medical treatment facilities make up most of this category.

- ***Central Personnel*** — includes all permanent change-of-station costs, recruiting and advertising expenditures, dependent support programs, various public relations functions, and assorted other personnel activities.

- ***Central Training*** — includes only formal training activities, not the larger costs of unit training and exercises.

- ***Science and Technology (S&T), DoD Labs, and Acquisition Management*** — includes primarily S&T funding and oversight of DoD labs.

- ***Installation Support*** — includes costs driven by the number and size of DoD installations.

- ***Force Management*** — includes management headquarters, some defense agencies, and some aspects of command, control, communications, and intelligence (C3I).

As indicated in Figure 13, logistics represents the largest share of infrastructure expenditures, claiming 40 percent of the total, followed by installation support, with a 17 percent share.

Infrastructure Categories
(As percentage of $160 billion in FY 1994 budget)

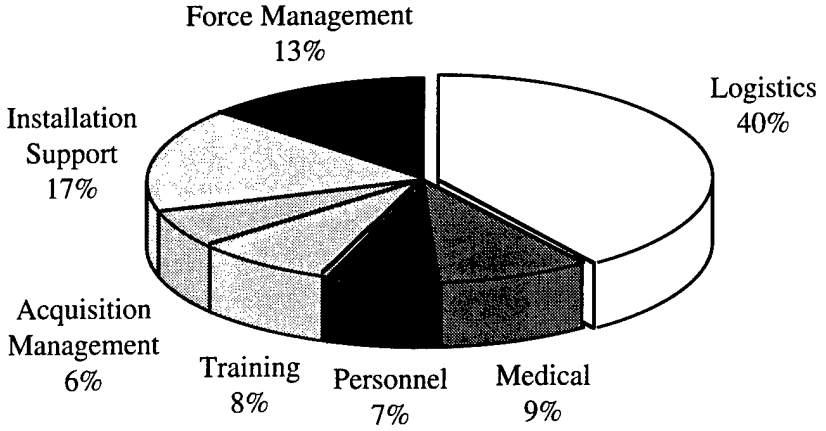


Figure 13

Infrastructure costs fall into two categories: those that are sensitive to changes in the overall force structure and those that are not affected when the size of the force is reduced. Our objective in the Bottom-Up Review was to identify potential savings and to launch a longer-term process of reducing and streamlining DoD's infrastructure without harming readiness.

Approximately 40 percent of infrastructure costs are tied directly to force structure. Examples include training, supply, and transportation costs. We will, of course, realize savings in these areas as our forces are reduced. Further opportunities for savings can be derived from supporting our operational forces more efficiently.

A detailed analysis of cost savings that could be realized as a result of force downsizing alone was conducted as part of the Bottom-Up Review. Since decisions on the final force structure were not available at the time the analysis was performed, a notional force was used. The analysis suggested that DoD should see direct infrastructure savings of between $10 billion and $11 billion resulting directly from the force drawdown.

The Bottom-Up Review also examined ways to obtain substantial savings in areas of infrastructure where costs have traditionally been seen as relatively fixed. Savings in these areas will require changing the basic ways in which DoD does business. For example, about 50 percent of infrastructure costs are a product of policy decisions or statutory requirements and can be reduced only through changes in public law or DoD directives. These include elements of funding for military installations, family housing, military base operations, depot maintenance, and schools for DoD dependents, both in the United States and abroad.

One such area of potential savings is the realignment and closure of additional U.S. military bases and facilities. This is accomplished through the BRAC process. Implementation of BRAC-93 decisions is expected to result in a savings of about $4 billion.

Another 10 percent of infrastructure costs are attributable to public law and policy decisions but are virtually impossible to reduce. Cutting expenditures here would require extremely difficult and, in some cases, undesirable changes, such as Congressional action to rescind or rewrite U.S. environmental laws. Included in this category are most environmental restoration efforts (which involve myriad legal, regulatory, and policy constraints), various legal entitlements of current and former service members, and the obligation to provide medical benefits to dependents of active-duty personnel.

There are three general methods of reducing variable infrastructure costs. These include increased use of privatization for business operations, additional consolidations and expanded use of executive agents, and better business practices and incentives. There have been many attempts to reduce costs in these areas before, and such efforts must be encouraged and expanded. The potential for savings, however, differs significantly across functional categories.

Privatization of DoD operations can, in selected cases, provide cost savings. Transferring operations to the private sector could yield savings in such areas as maintenance, base operations, and concession functions. There are significant economies of scale that can be realized from consolidating certain functions, such as accounting services, and appointing executive agents for training and depot maintenance. Employing better business practices over a range of DoD activities will enable us to reduce infrastructure costs without cutting outputs.

The Bottom-Up Review has provided a detailed framework of options for reducing infrastructure costs. Just by reducing force size, savings of around $10 billion to $11 billion will be realized in the 40 percent of infrastructure costs that are directly tied to our operational force structure. Another $4 billion in savings will be achieved with the implementation of BRAC-93 decisions. Further cost savings will come from changes in policy directives and, in some cases, public law, as we make adjustments with an eye toward privatization, consolidation of functions, and better business practices. We will pursue the maximum savings possible in each infrastructure category, while maintaining an adequate level and quality of infrastructure to support our forces.

SECTION VII: DEFENSE FOUNDATIONS

ENVIRONMENTAL SECURITY

In the post-Cold War era, DoD's approach to environmental problems must rest on two basic premises. First, our national security must include protection of the environment, and environmental concerns must be fully integrated into our defense policies. Second, to protect our nation we must also have a strong economy; protecting the environment and growing the economy must go hand in hand.

Environmental concerns are an integral part of U.S. national security policy because of the effect that environmental conditions have on economic and political stability, because of the growth in environmental costs as a share of the national security budget, and because of the loss of public trust caused by military noncompliance with environmental laws and regulations.

Reflecting the Clinton Administration's commitment to preserving and protecting the environment, the Department of Defense created a new Environmental Security Program with a mandate to ensure that appropriate environmental, safety, and health considerations are brought to bear in the development of national security policy; that the environment is protected in defense operations; and that our environmental stewardship is used to promote economic growth. This program is being pursued in partnership with other federal agencies, states, private industry, the public, and Congress.

This new program is based on a C^3P^2 (C-cubed, P-squared) foundation, which stands for cleanup, compliance, conservation, and pollution prevention. The Department will establish goals and priorities in each of these areas and will establish measurable ways to demonstrate progress.

Over time, this program should provide DoD with a better environmental security strategy, better information and control systems for effective management, uniform cost-estimating methods within the Department, an environmental security technology program directed toward user needs, and increased public involvement in environmental security efforts.

Threats to Environmental Security

The Department's national security mission includes performing defense operations in an environmentally responsible manner, deterring environmental threats that could lead to international instability, and when appropriate, applying military capabilities to mitigate environmental effects of natural disasters.

Environmental security threats are defined as conditions affecting human health, safety, or the environment that actually or potentially (1) impair the ability of DoD to prepare for and perform its national security mission or (2) create instabilities that can threaten U.S. national security.

The most notable environmental threats to U.S. security to which the Department must respond are: ***global threats***, such as warming, ozone depletion, loss of biodiversity, and nuclear proliferation; ***regional threats***, such as environmental terrorism, accidents or disasters, regional conflicts caused by scarcity or denial of resources, and cross-border and global contamination; and ***national threats***, such as risks to public health and the environment from DoD activities, increasing restrictions on military operations, inefficient use of DoD resources, reduced weapon system performance, and erosion of public trust.

Program Objectives

The Bottom-Up Review evaluated each of the Department's environmental security programs in light of the following objectives: ***reducing environmental risk*** by minimizing threats to human health and safety; ***ensuring full compliance*** with U.S. environmental laws and regulations and with the Overseas Environ-

mental Baseline Guidance document; ***enhancing cost-effectiveness*** and reducing costs wherever possible; ***targeting environmental technology*** on the most serious problems and where research and development will achieve the highest payoffs; ***improving U.S. public involvement and awareness*** by conducting open, frequent, and meaningful public dialogues and information exchanges; and ***producing measurable results*** in performance, schedule, and cost. This includes reductions in environmental risks, protection of natural resources, compliance with environmental laws or regulations, and reductions in pollution levels.

New Directions Needed

The Department has stewardship for about 25 million acres of land around the world, and has identified more than 18,000 sites that may need to be cleaned up. Cleanup requirements include: fuels and solvents at about 60 percent of our sites, toxic and hazardous waste at about 30 percent, unexploded bombs and artillery shells at about 8 percent, and low-level nuclear waste at about 2 percent.

Based on its examination of environmental programs, the Bottom-Up Review identified the following objectives for DoD's environmental security strategy:

Cleanup programs must reflect a new "common sense" strategy that relates cleanup standards to planned land use; eliminates contamination "hot spots" and evaluates the balance of contaminated sites for application of environmental technologies; increases public involvement in decisionmaking; and achieves significant economies in the management of cleanup programs. We will complete preliminary assessments at all sites; mitigate contamination at all "hot spots"; consider future land use in developing cleanup strategies; and fully implement the President's "fast track" cleanup program at bases slated for closure.

Compliance programs need to improve our ability to identify, program, and budget for environmental security requirements and evaluate program execution; improve education and training to ensure full compliance; increase partnership efforts with federal and state regulators and the public to achieve sustained compliance, including creation of regional DoD environmental offices; develop an investment strategy to upgrade the Department's infrastructure; and resolve deficiencies as soon as possible.

Conservation programs need to enable DoD to participate fully in the National Biological Survey and complete resource inventories of all DoD lands and waters; improve ecosystem management and protection of resources; and establish DoD-wide energy and resource conservation guidelines and incentives to reduce energy consumption.

Pollution prevention programs need to ensure that life-cycle environmental security costs and benefits are considered explicitly in acquisition and supply system decisions, and that incentives are provided to reduce sources of pollution and promote more efficient material and energy procurement and use, including reuse, recycling, and creating markets for recycled materials. Specifically, the Department will reduce non-mission-essential use of ozone-depleting substances and reduce toxic releases and the generation of solid and hazardous waste.

Technology development efforts need to meet widespread environmental needs with programs that yield quick results and have high payoffs. In addition, the Department must develop a system to determine technology priorities and eliminate overlapping funding; engage in technology partnerships to stimulate innovative technology development and promote dual use where appropriate; and improve technology transfers within and outside DoD, particularly technologies to characterize and clean up sites.

The Department also needs to redesign its budget preparation and execution tracking procedures for environmental security programs.

The new Environmental Security Program will ensure that both environmental threats and environmental protection are prominent parts of the defense program. Giving these issues the attention they deserve will be vital to our national security and to our economic growth in the years ahead.

ACQUISITION REFORM

The Need for Reform

The DoD acquisition system developed and acquired the best weapons and support systems in the world. It was critical to fielding the quality armed forces the United States has today. However, just as we need to reshape our forces from the bottom up in response to the changed security environment, so must we restructure our acquisition system to compensate for the decline in available resources for defense investment and to exploit technological advances in the commercial sector of our economy more effectively.

In addition, certain oversight and regulatory practices that were adopted during the Cold War are no longer affordable or necessary today. The existing DoD acquisition system is based on outdated management philosophies and organizational structures. Our acquisition organization is segmented, overly specialized, and hierarchical. There are so many hand-offs of responsibility for any one acquisition program that accountability is difficult, and the ability of any one person or organization to change the process is small.

The current acquisition system has been shaped by myriad rules, regulations, and laws that were intended to protect the government, ensure fairness, check the government's authority over its suppliers, or further social objectives. However, while these laws and regulations were noble in intent, in practice they have often burdened the acquisition system unnecessarily, adding unnecessary costs to items produced by defense contractors, discouraging commercial contractors from selling to the government, and increasing DoD's management and control costs. Examples include:

- Regulations governing military specifications that were adopted to ensure that products would both meet users' needs and be purchased from the lowest bidder.

- Laws requiring DoD to use small businesses and buy only American-made products, which were enacted to further particular public interests.

- Oversight requirements both within DoD and over DoD contractors that have burgeoned in an effort to eliminate waste, fraud, or abuse of the system.

Today's rules and regulations are barriers to the use of commercial practices, the purchase of commercial products, and the integration of the defense and commercial industrial bases. Any attempt at acquisition reform must take the original intent of current regulations into consideration, but must also find ways to: (1) reassess their viability given expected DoD procurement changes or (2) where appropriate, modify laws and regulations to ensure that they protect the government's interest while fostering more effective and efficient acquisition procedures.

The Path to Reform

The DoD acquisition system should establish reasonable and affordable requirements and provide the most efficient, timely, and effective means of acquiring state-of-the-art goods and services to meet those requirements at the best value to the American taxpayer.

There are two goals that reform of the defense acquisition system can and must achieve immediately in order to succeed in our longer-term reform objectives:

- First, we must adopt commercial practices to the maximum extent possible to make DoD a better customer and to foster the integration of the defense and commercial industrial bases.

- Second, we must more closely link the systems requirements process to the operational plans and needs of the unified commands, as well as to the resource allocation process.

Integrating major parts of the defense industrial base with the commercial industrial base and having DoD adopt the best practices of today's commercial industries is the key to our reforms. We can no longer rely on a large defense industrial base consisting of companies who cater only to the needs of the military; our reduced defense spending will simply not support a separate defense industrial base with many companies largely isolated from the commercial sector.

Integrating the defense and industrial bases and making DoD a better customer will allow us to meet several key objectives:

- ***Maintain "leading edge" technology.*** In order to stay on the cutting edge of technology, we must look beyond our traditional defense contractors and subcontractors. Modern weaponry relies heavily on advanced electronics, software, telecommunications, flexible manufacturing techniques, and other advanced technologies where commercial companies are often making the most significant advances.

- ***Broaden the industrial base for DoD.*** Because the defense-dedicated industrial base will necessarily shrink, it would probably not be sufficient to handle expanded requirements in a large-scale crisis. Broadening the base of potential suppliers will ensure that the United States has the capability to gear up production again should that become necessary.

- ***Encourage innovation and reduce acquisition time.*** Having a larger base to draw upon and making DoD a better customer will encourage innovation in products and practices, both in government and private industry; allow more flexible solutions to acquisition problems; and reduce the time it takes to acquire products and services.

- ***Become more efficient.*** A larger base of companies creates more competition, which in turn yields more efficient operations and reduces the time required to acquire products and services. Increased competition also allows the market to set and enforce fair prices. This will allow us to reduce unnecessary infrastructure and oversight still further.

- ***Integrate military and commercial advanced technologies.*** Integrating the defense and commercial industrial bases means that the results of substantial investments in military-related technologies will be available for exploitation by commercial industry. This will help the U.S. economy.

We also plan to better integrate the unified commanders, those who will actually use the systems, into the process of determining what systems will be acquired. In addition, the overall budget process must be linked more closely with individual acquisition decisions. Such integration will add flexibility, efficiency, and innovation to the acquisition process by encouraging consideration of alternative or substitute systems to meet the needs of weapons users.

An Agenda for Reform

To bring daily attention to these issues, the office of the Deputy Under Secretary of Defense for Acquisition Reform (DUSD(AR)) has been established. This office will be the focal point for all acquisition reform issues and for restructuring the acquisition system. The DUSD(AR) will also chair a Senior DoD Acquisition Reform Steering Group, whose members will make recommendations on acquisition reform goals, principles, and actions.

We have identified the following short-term priority measures as the first steps in what will be a larger reform effort:

- Simplify the acquisition of purchases under $100,000.

• Remove impediments to the purchase of commercial items and services.

• Develop proposals for pilot programs pursuant to the authority in Section 809 of the National Defense Authorization Act for Fiscal Year 1991 (Public Law 101-510).

• Reaffirm the policy preference for the acquisition of commercial items and the use of functional performance specifications unless a DoD-unique product specification or process is the only practical alternative to ensure that a product or service meets users' needs.

• Repeal outdated and unnecessary service-unique statutes as proposed by the "Section 800" *Acquisition Streamlining Report.*

These priorities, the objectives of the acquisition reform effort, and the strategy for meeting those objectives will continue to develop as DoD works with other organizations conducting related efforts — such as the National Performance Review. In addition, many of these initiatives require coordination with and support from other federal agencies, such as the Department of Labor and the Small Business Administration. We will work with the Office of Federal Procurement Policy, the Office of Management and Budget, and other federal agencies to ensure that acquisition reform initiatives are applied government-wide where appropriate.

The Bottom-Up Review was only the beginning of our efforts to reform the acquisition system. The process does not end here. The DUSD(AR) will soon be unveiling a detailed strategic plan for acquisition reform that builds on the results of the Bottom-Up Review and increases the scope of action.

SECTION VII: DEFENSE FOUNDATIONS

DEFENSE REINVESTMENT AND ECONOMIC GROWTH INITIATIVES

The Clinton Administration has placed a high priority on confronting economic dangers to the nation's security. This means revitalizing the American economy and laying the foundation for a competitive U.S. economy in the next century. The Department of Defense will be central to that effort. It can begin by contributing resources once earmarked for defense to investments aimed at improving our long-term productivity — education and training, infrastructure, investment incentives, and "civilian" research and development. But beyond simply shifting resources to non-defense sectors, DoD can actively assist in the transition to a post-Cold War economy.

The Defense Reinvestment and Economic Growth Initiatives aim to promote economic growth while preserving a strong military and defense industrial base. The initiatives focus on three main program areas: dual-use technology, personnel assistance, and community adjustment assistance.

Dual-Use Technology. In an era in which our national security cannot be separated from our economic security, it is imperative that we support the development of dual-use technologies and encourage the freer flow of technology between the civilian and military sectors. Programs in this area include: reinvestment initiatives to boost research and development of critical dual-use technologies as well as efforts to commercialize and deploy such technologies; programs to assist small manufacturers (with up to 500 employees) in upgrading their capabilities to meet commercial and defense needs; and electronics and materials initiatives to support industry research on dual-use technologies in areas ranging from higher-definition systems to composite materials manufacturing.

Personnel Assistance. To achieve the economic strength that will underwrite our national security in this new era, we must refocus the talents, energy, and dedication of men and women involved in national defense on creating economic growth in their communities. Personnel assistance programs will help military members and defense workers make professional transitions, with services ranging from employment consulting and job training to separation pay and health benefits.

Community Adjustment Assistance. Scores of defense-dependent communities are experiencing hard times as defense workers lose their jobs and as businesses contract. These communities need investments to help reorient their work forces, their firms, and their economic base. Initiatives in this area include programs designed to speed and improve the process of base closure and property disposal in affected communities; ensure that every community with a military base scheduled for closure has the tools and the expertise to develop a plan for economic conversion and revitalization, through programs such as those administered by the Office of Economic Adjustment; and allow retired military and reserve personnel to address unmet needs in the nation's schools and communities, such as an expanded Junior ROTC program and the National Guard's Youth Opportunities pilot program.

Funding in FY 1994 for these initiatives is $1.66 billion. These programs represent an investment in both our economic and our national security. As such, they are an investment we cannot afford not to make.

SECTION VIII

RESOURCES TO IMPLEMENT THE DEFENSE STRATEGY

The Bottom-Up Review's Budgetary Starting Point

The final step in the Bottom-Up Review process was to match resources to the defense strategy, force structure, and modernization programs selected. While the Bottom-Up Review was driven primarily by considerations of what constituted the best defense strategy and policy for America, it obviously could not ignore economic realities. Thus, at the conclusion of the review, we estimated what the recommended program would cost and matched it against President Clinton's direction for reductions.

To establish a baseline for this cost comparison, we began with the Bush defense program and adjusted it to reflect updated economic assumptions, the government-wide federal pay reduction, and the findings of a Defense Science Board task force, led by defense analyst Philip Odeen, which was formed to determine if the Bush Administration's defense program had been properly costed. Those adjustments resulted in a baseline total of $1,325 billion for the FY 1995-99 FYDP. The Clinton Administration defense budget target for this same period was $1,221 billion; this was based on the President's April 1993 budget, adjusted to reflect the Odeen Panel's findings. Thus, as shown in Table 1, the difference between the baseline and the fiscal target for the FYDP years is $104 billion.

Baseline Versus Clinton Future Years Defense Program

(Billions of Dollars in Budget Authority)

	FY95	FY96	FY97	FY98	FY99	FY95-99
Baseline	257	261	264	270	273	1,325
Clinton Budget	249	242	236	244	250	1,221
Reduction	8	19	28	26	23	104

Table 1

Budgetary Impact of the Bottom-Up Review

The results of Bottom-Up Review decisions will become adjustments to the FY 1995-99 baseline ($1,325 billion) program. The decisions fall into four categories:

- Force structure
- Infrastructure (including base closures)
- Modernization and investment programs
- Initiatives

Force Structure. These changes comprise adjustments to Army, Navy, Air Force, and Marine Corps force structure and end-strength, as compared to the Base Force. The active-duty forces of the Army, Navy, and Air Force will be reduced, while Marine Corps and National Guard and reserve forces are increased. Savings in infrastructure directly related to force structure cuts will also be realized. Finally, provisions have been made for the costs of achieving DoD's environmental security objectives. In total, force structure decisions from the Bottom-Up Review will reduce funding requirements by $24 billion from the FY 1995-99 baseline.

Infrastructure. Separately from the force structure-derived changes to DoD infrastructure, opportunities for savings and efficiencies were found elsewhere in DoD supporting activities, as discussed in Section VII. For example, savings were identified through reductions in headquarters and cuts in civilian personnel levels, as well as through the realignment and closure of military bases and facilities. Estimated savings in these infrastructure programs total $19 billion.

Modernization and Investment Programs. This broad category includes the development and procurement of ships, aircraft, and other combat equipment, as well as DoD's Science and Technology and Defense

Reinvestment programs. The realigned ballistic missile defense program will generate savings of approximately $21 billion during FY 1995-99. Other modernization decisions focus on areas where the Bottom-Up Review determined that savings can be achieved (aircraft carriers, space launch, theater aircraft, military communications satellites, and other programs). There also are some systems in which the Clinton-Aspin strategy requires additional investment (combat helicopters, attack submarines, and the V-22 program). Finally, the Defense Reinvestment program will emphasize technologies of potential "dual use" in the military and civil sectors, assist DoD personnel affected by the restructured defense program, and help communities adjust to closure of nearby military bases. The net effect of these investment program decisions (aside from ballistic missile defense) will be a $32 billion savings during FY 1995-99.

Initiatives. As discussed in Section VI, new initiatives include cooperative threat reduction; counterproliferation efforts; expanded contacts and cooperation with the states of the former Soviet Union; global initiatives to promote democracy; peacekeeping and peace enforcement operations; and humanitarian assistance. The Bottom-Up Review determined that $5 billion could prudently be added over FY 1995-99 to pursue these objectives.

Summary of Savings in the FYDP. In total, decisions made in the Bottom-Up Review will achieve an estimated $91 billion in savings (during FY 1995-99) from the $1,325 billion baseline program (see Table 2). Relative to the Administration's target reduction of $104 billion, this is a shortfall of about $13 billion. This difference is spread across the first four years of the FYDP.

Estimated Resource Changes from the Bottom-Up Review

(Billions of Dollars in Budget Authority)

	FY 1995-99
Force Structure	-24
Infrastructure	-19
BMDO	-21
Other Modernization and Investment	-32
Initiatives	+5
Total Savings	-91

Table 2

It is important to note that these figures are planning estimates. The Bottom-Up Review developed a strategic framework for defense reductions, not a budget. Throughout the fall, DoD will conduct its normal program and budget review, during which it will identify the additional $13 billion in reductions needed to meet the President's target. Further savings are likely to come from the following areas:

- ***The National Performance Review.*** The Vice President's study has many good ideas for better, cheaper government that will be examined by DoD.

- ***The FY 1995 Base Closure and Realignment Process.*** Savings here may be significant, but would not occur until late in the FYDP.

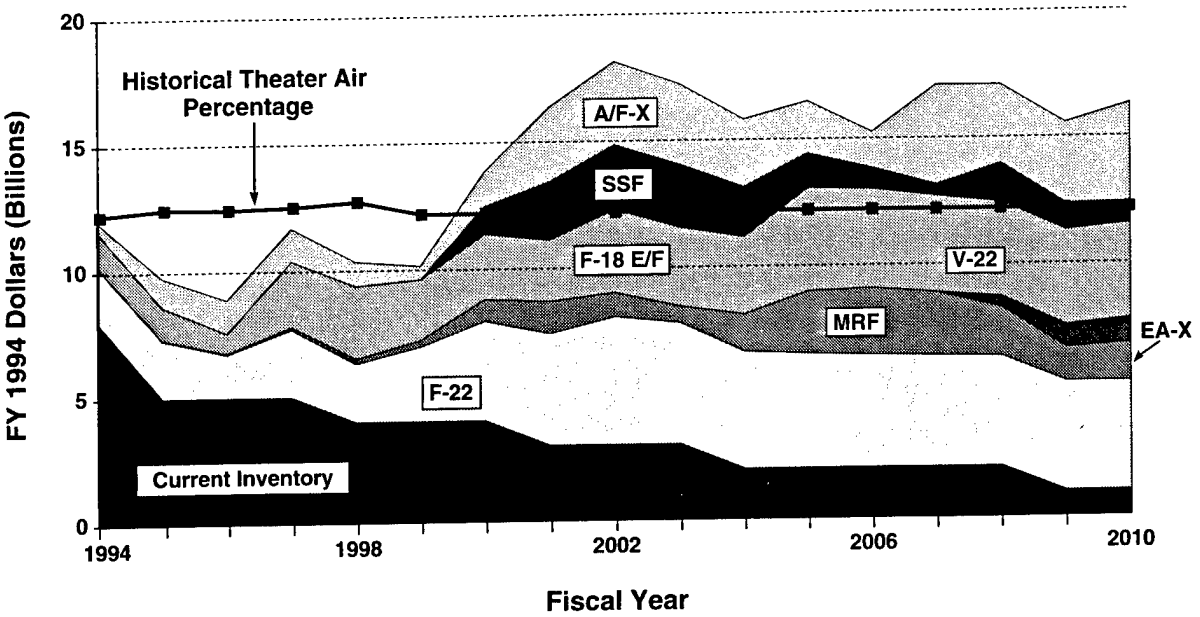
- ***Acquisition Reform.*** No savings from acquisition reform were counted in the Bottom-Up Review.

- ***Strategic Programs.*** We are conducting an extensive review of strategic requirements and programs and are likely to find reductions possible.

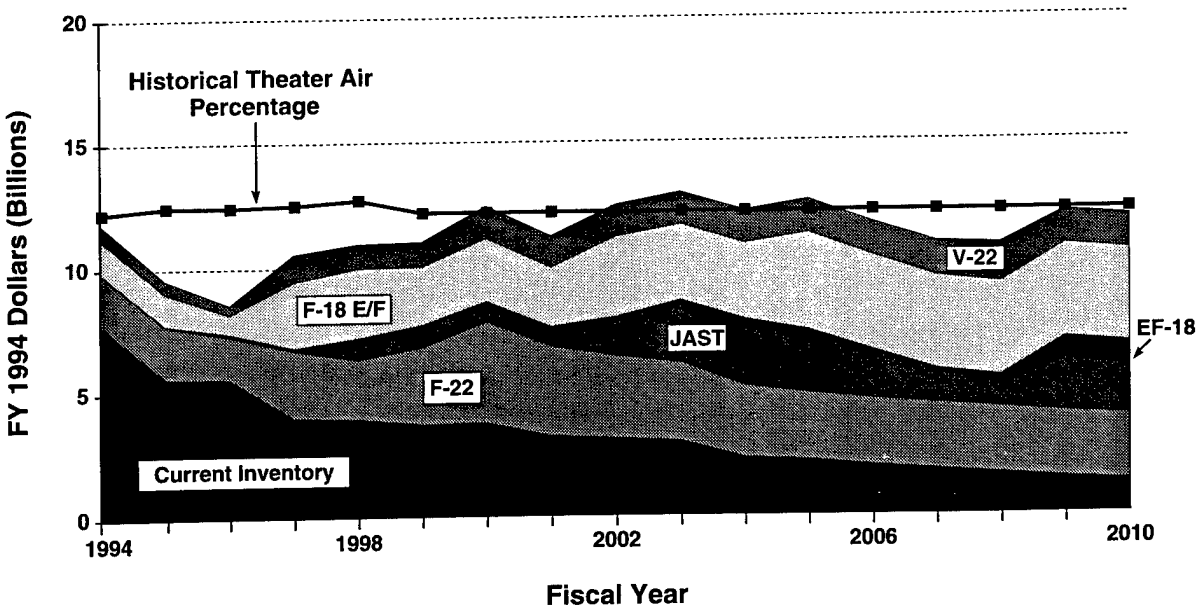
Addressing the "Bow Wave" Problem. As the Bottom-Up Review tracked the impact of its recommendations over the FYDP period, it remained mindful of consequences for defense spending in the year 2000 and beyond. The review was particularly intent on preventing this year's decisions from producing large bills that would have to be paid in future defense budgets.

In most cases, the Bottom-Up Review found that sizing defense programs properly now would prevent "bow wave" problems from occurring later. For example, the previous administration's theater aircraft modernization program called for developing too many new combat aircraft. As shown in Figure 14, these systems would have absorbed a steadily increasing share of investment dollars as they moved into advanced development or procurement early in the next decade. However, as also shown in Figure 14, the new theater aircraft program recommended in the Bottom-Up Review eliminates this "bow wave" while fully funding the V-22 program.

Theater Air Program



Base Force



Bottom-Up Review

Figure 14