
Lighting the Path Ahead: Field Exercises and Transformation

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EXECUTIVE SUMMARY

Today the US military finds itself in a period of large-scale change in the conduct of warfare. There is wide verbal acceptance in American military circles that we are in the midst of a military revolution, or “revolution in military affairs” that will require a transformation of the US armed forces. Yet despite the rhetoric, the American military is not conducting the kind of Joint and Service field exercises characteristic of military organizations engaged in transformation.

This report makes the case that field exercises, and the experiments they make possible, play a critical role in enabling military innovation and transformation, which can be defined as innovation on a grand scale or on a scale sufficient to bring about a change in warfare regimes (i.e., a military revolution). Properly undertaken, field exercises are a source of great competitive advantage. Their benefits include:

- Reducing uncertainty concerning how best to meet emerging threats;
- Determining the proper mix of emerging and legacy systems in the future force;
- Enabling militaries to develop and evaluate a wide range of military capabilities and forms of operation, which can be fully and rapidly developed if and when a threat emerges;
- Generating successes that inspire enthusiasm for, and sustain the momentum of, military transformation and innovation;
- Complicating the planning of would-be enemies;
- Identifying intra-regime shifts—major shifts in the military competition that, while they do not require large-scale transformation, do require the military to effect significant innovation;
- Helping to avoid premature, large-scale production of emerging systems that may appear promising but that actually offer little in terms of military capability; and
- Identifying and solving the practical problems inherent in developing new operations, force structures and systems that cannot be determined through wargames and simulations.

To meet emerging challenges in such a way as to preserve the current level of national security, the Defense Department must effect significant changes in its approach to Joint and Service field exercises and increase dramatically the priority accorded to experimentation. At present, the Department’s effort lacks focus and is woefully underfunded. Given the characteristics of field exercises in previous instances of successful military transformation, it would seem that a Defense Department field exercise/experimentation initiative should be defined by *all* of the following characteristics:

A COMPELLING VISION

All transformation efforts, to include transformation field exercises, need to be informed and guided by a compelling vision of how future military competitions will be different from those that dominate warfare today. Put another way, the US military leadership must provide a compelling answer to the question, “Why should the world’s best military transform itself?”

A PROMPT AND SUSTAINED EFFORT

If history is any guide, and if the Defense Department is serious about transforming the US military, then field exercises directed toward that end must be initiated now and conducted on a frequent basis. These exercises must be an enduring element of the US military’s transformation strategy.

AN EMPHASIS ON THE OPERATIONAL LEVEL OF WAR

To date, field exercises and experimentation have been heavily weighted toward the tactical level of warfare. Although field exercises and experimentation should take place at *all levels* (tactical, operational and strategic) of warfare, primary emphasis should be placed at the operational level.

AN ADEQUATE LEVEL OF RESOURCES

During the latter stages of the Cold War, the US military invested in a number of high-fidelity training facilities that greatly enhanced the value of its field training. Facilities do not yet exist to support comparable Joint field exercises that enable experimentation in support of transformation. To remedy this, the Defense Department needs to establish, under Joint Forces Command, a Joint National Training Center; Joint Urban Warfare Training Center; and Joint Opposing Force.

Moreover, to employ these assets effectively, Joint Forces Command also requires a budget that is at least an order of magnitude over what it is at present; and Major Funding Program budget authority, similar to the one enjoyed by the Commander-in-Chief, Special Operations Command.

If it is to meet emerging challenges in such a way as to preserve the current level of national security, the Defense Department will have to effect significant changes in its approach to military transformation. One key challenge is to increase dramatically the priority accorded to Joint and Service field exercises, to include their reorientation to address emerging challenges and opportunities stemming from the ongoing military revolution. The potential gains from a properly directed and funded field exercise campaign are clear, and the cost of such an initiative would run well under one percent of the US defense budget. The risks associated with continuing along the current path are clear as well. They include developing the right capabilities for the wrong threats, and, ultimately, the prospect of paying a price measured in jeopardized security interests, national treasure, and the lives of young American service men and women.

I. INTRODUCTION

It was early Sunday morning, the seventh day of the month, on the US island of Oahu in the Hawaiian Islands. During the previous night, a naval task force approached the island maintaining absolute radio silence and running without lights. As the night progressed, the task force's aircraft carriers executed a high-speed run toward the island, which boasted some of the most important American military bases in the Pacific, including the Army Air Corps' Hickam Field and the naval base at Pearl Harbor.

An hour before daybreak, the carriers launched their strike aircraft, which headed for Oahu in the still dark sky. The strike formations used the battery of searchlights at Kahuku Point as a navigation aid to guide them toward their targets. They pressed home their attack just as dawn was breaking over Pearl Harbor, achieving complete surprise. Army Air Corps pilots scrambled to take off in search of the attacking force, but failed to locate it. Upon returning to base they were struck by a second wave of carrier strike aircraft.¹

Fortunately for the defenders of Oahu, the attack, executed on the morning of Sunday, February 7, 1932, was a joint US Army-Navy exercise. The attacking planes had been launched by Rear Admiral Harry Yarnell, commander, Aircraft Squadrons, Battleforce, of the newly commissioned American aircraft carriers *Saratoga* and *Lexington*. While the Army Air Corps protested the legality of conducting an attack on a Sunday morning, and disputed the effectiveness of Yarnell's dive bombers, the joint exercise provided valuable insights as to how newly emerging military capabilities might transform the character of warfare.² Indeed, the US Navy's enlightened and intensive use of wargames and fleet exercises during the 1920s and 1930s was such that Admiral Chester W. Nimitz, looking back on the Navy's experience in the war against Japan, could later remark that "nothing that happened in the Pacific was strange or unexpected."³

Today the US military finds itself in a similar period of large-scale change in the conduct of warfare. There is wide verbal acceptance in American military circles that we are in the midst of a military revolution, or "revolution in military affairs" (RMA) that will require a "transformation" of the US armed forces.⁴

¹ This account is taken from Thomas Wildenberg, *Destined for Glory* (Annapolis, MD: Naval Institute Press, 1998), pp. 95–96.

² Clark G. Reynolds, *Admiral John H. Towers* (Annapolis, MD: Naval Institute Press, 1991), pp. 237–38.

³ Letter, Chester W. Nimitz to President, Naval War College, September 24, 1965, Naval historical collection, Naval War College, Newport, Rhode Island. Cited in Thomas B. Buell, "Admiral Raymond A. Spruance and the Naval War College," *Naval War College Review*, March 1971, p. 33.

⁴ For example, the Defense Department's acknowledgement of an emerging military revolution dates back at least to the mid-1990s. See William J. Perry, *Annual Report to the President and the Congress* (Washington, DC: Department of Defense (DoD), February 1995), p. 107. Over time, in response to the military revolution, the Defense Department has endeavored to develop a transformation strategy for the US military. See William S. Cohen, *Annual Report to the President and the Congress* (Washington, DC: DoD, 2000), pp. 123–34.

Yet despite the rhetoric, the American military is not conducting the kind of Joint and Service field exercises described above. To be sure, a new command—Joint Forces Command or JFCOM—was recently established to provide a home for such joint field exercises. But the initiative came not from the military, but from Congress, which was inspired by the results of the National Defense Panel (NDP), another congressional creation.⁵ And, as will be discussed presently, JFCOM has yet to move aggressively to conduct such exercises.

This report makes the case that field exercises, and the experiments they make possible, play a critical role in enabling military transformation, which can be defined as innovation on a grand scale or on a scale sufficient to bring about a change in warfare regimes (i.e., a military revolution). To be sure, wargaming and simulations, along with other analytic tools, also play important roles in support of military transformation.⁶ Our discussion here, however, is limited to field exercises.

The discussion that follows comprises two main parts. The first examines the value of field exercises in enhancing military effectiveness, especially during periods of large-scale change in the character of conflict, such as we are experiencing today. The second presents an overview of the US military's current attempts to employ field exercises as a means of enabling large-scale innovation or transformation. Moreover, while the military revolution is likely to yield a range of new challenges for the US military to focus the discussion, the paper limits the discussion to the issue of US military power-projection operations. Power-projection operations are chosen also because they employ the full range of America's conventional forces and represent the "fundamental strategic concept" of future US operations.⁷ Specifically, this report focuses on the two principal emerging threats to US power-projection operations: the anti-access and area-denial threats.

WHY FIELD EXERCISES?

Over the last century, military field exercises oriented on addressing emerging challenges and opportunities at the operational level of war have proven to be an important enabler of military innovation and transformation. Properly undertaken, field exercises are a source of great competitive advantage. Their benefits include:

- Reducing uncertainty concerning how best to meet emerging threats;

⁵ See NDP, *Transforming Defense: National Security in the 21st Century* (Washington, DC: n.p., December 1997), pp. 68–72.

⁶ Early in the transformation process, wargaming and simulations can be excellent means for identifying new systems and force elements and developing new operational concepts as well as weeding out those that have serious flaws. For example, the wargames conducted at the Naval War College in the early 1920s proved extremely useful in developing promising operational concepts for the use of naval air power, as well as the associated measures of effectiveness. Given the perennial environment of limited time and resources under which military organizations must operate, well-designed and executed wargames and simulations can provide an invaluable service to those charged with developing a program of field exercises as part of a larger transformation strategy.

⁷ Joint Chiefs of Staff (JCS), *Joint Vision 2010* (Washington, DC: DoD), p. 4.

- Determining the proper mix of emerging and legacy systems in the future force;
- Enabling militaries to develop and evaluate a wide range of military capabilities and forms of operation, which can be fully and rapidly developed if and when a threat emerges;
- Generating successes that inspire enthusiasm for, and sustain the momentum of, military transformation and innovation;
- Complicating the planning of would-be enemies;
- Identifying intra-regime shifts—major shifts in the military competition that, while they do not require large-scale transformation, do require the military to effect significant innovation;
- Helping to avoid premature, large-scale production of emerging systems that may appear promising but that actually offer little in terms of military capability; and
- Identifying and solving the practical problems inherent in developing new operations, force structures and systems that cannot be determined through wargames and simulations alone.

Because of these characteristics, military field exercises are especially beneficial during periods of high uncertainty and rapid change. Such a period exists today. The United States military confronts a highly dynamic international environment. It also must deal with rapid advances in military-related technologies that seem likely to bring about a military revolution. Military revolutions are characterized by dramatic leaps in military capability and effectiveness within a relatively short period of time. They are also characterized by great uncertainty with respect to what new military systems, organizations, concepts of operation, and force elements will emerge to supplant the existing military regime, and which will prove to be chimerical. Consequently, the potential for surprise is high during such periods, when the time available to respond to unexpected events is often exceedingly short.⁸

Military field exercises that incorporate experimentation can play an important role in reducing the uncertainty about the future conflict environment and those capabilities, force elements and operational concepts that will dominate that environment. The ultimate expression of such efforts will likely be the conduct of joint exercises at the operational level of warfare. This is because joint operations (i.e., operations involving two or more of the military services) will almost

⁸ For a discussion of the military revolution as a phenomenon, see Andrew F. Krepinevich, *The Military-Technical Revolution: A Preliminary Assessment* (Unpublished Paper, Office of Net Assessment, Office of the Secretary of Defense, DoD, July 1992); Andrew F. Krepinevich, “Keeping Pace with the Military Technological Revolution,” *Issues in Science and Technology*, (Summer 1994); Andrew F. Krepinevich, “Cavalry to Computers: The Pattern of Military Revolutions,” *The National Interest*, Fall 1994; and Michael G. Vickers, *Warfare in 2020: A Primer* (Washington, DC: CSBA, 1996).

certainly dominate future military operations, and because the operational level of war is the level at which military campaigns are conducted.⁹

Unfortunately, the Defense Department's rhetoric asserting the need for military transformation and its support for joint field exercises that include experimentation has yet to be matched by any great sense of urgency or any substantial resource support. Those exercises that are undertaken in support of transformation tend to focus more on improving existing warfighting capabilities than on preparing to meet the threats and challenges of tomorrow. If it is to meet emerging challenges in such a way as to preserve the current level of national security, the Defense Department must effect significant changes in its approach to joint field exercises and increase dramatically the priority accorded to experimentation. At present, the Department's effort lacks focus and is woefully underfunded.

FIELD EXERCISES AND TRANSFORMATION

In January 1929, the United States Navy undertook a major exercise, titled Fleet Problem IX. It was one of a series of exercises undertaken by the Service during the years between the two world wars. Despite the isolationist mood of America at the time, compounded by tight military budgets and arms control constraints, the Navy persisted in conducting these exercises as, among other things, a means for determining the influence of continuing rapid advances in aviation technology upon sea power.¹⁰

Fleet Problem IX took place off the coast of Panama. Present for the first time in the fleet problems were two ships of radically different design. These ships, the *Saratoga* and *Lexington*, were aircraft carriers. During the exercise, Vice Admiral William Pratt, commander-in-chief (CINC) of the US fleet, authorized Rear Admiral Joseph Reeves, commanding the *Saratoga*, to execute a high-speed run toward the Panama Canal. Reeves then "attacked" the canal with a 70-plane strike force launched 140 miles from the target.¹¹

Following Fleet Problem IX, Admiral Pratt observed, "I believe that when we learn more of the possibilities of the carrier we will come to an acceptance of Admiral Reeves' plan which provides for a very powerful and mobile force . . . the nucleus of which is the carrier."¹² The following year, upon becoming Chief of Naval Operations, Pratt stressed that carriers be placed

⁹ The Joint Chiefs of Staff have gone so far as to declare that "The joint force, because of its flexibility and responsiveness will remain the key to operational success in the future To build the most effective force for 2020, we must be fully joint: intellectually, operationally, organizationally, doctrinally, and technically." JCS, *Joint Vision 2020* (Washington, DC: DoD, 2001), p. 2.

¹⁰ The Washington Naval Treaty of 1922 had, among other things, banned the construction of battleships and limited carrier tonnage among the major naval powers.

¹¹ Norman Friedman, Thomas C. Hone and Mark D. Mandeles, *The Introduction of Carrier Aviation into the US Navy and Royal Navy: Military-Technical Revolutions, Organizations, and the Problems of Decision* (Unpublished Paper, May 12, 1994), p. 94.

¹² Clark G. Reynolds, *The Fast Carriers* (Annapolis, MD: Naval Institute Press, 1968), p. 17. Pratt flew his flag from the *Saratoga* on the return cruise, "partly as a badge of distinction, but most because I want to know what makes the aircraft squadrons tick."

on the offensive in war games and fleet exercises. Through such exercises, involving experimentation with new kinds of equipment, doctrine and formations, Navy leaders sowed the seeds that brought forth the fast carrier task forces, which revolutionized warfare at sea and enabled the US Navy to defeat the Imperial Japanese Navy during World War II.

Eight years after Fleet Problem IX, on the North German Plain in Europe, a new and very different ground formation appeared in exercises conducted by the German Army: the panzer division. The panzer division was a combined arms formation possessing large numbers of fast tanks with substantial range and centered on a doctrine that called for rapid, deep penetration operations as a means for achieving victory. This represented a dramatic departure from Germany's World War I experience against its principal enemy, France. That conflict was dominated by slow-moving forces employing heavy firepower and engaged in a gradual war of attrition.

In the maneuvers, after a 60-mile approach march, the panzer division went on the attack, forcing the "enemy" to commit its reserves. The following day the panzer division not only broke through the enemy front but also penetrated deep into its rear. The enemy's position quickly became untenable, and the contest was essentially decided only four days into what had been planned as a seven-day exercise. General Franz Halder, like many others present who witnessed the spectacle (but who, unlike the others, would also become Chief of the German General Staff a year later), was stunned by the "fluid mobility" of the panzer operations.¹³

Many other field exercises were conducted during the 1920s and 1930s by the German military. They included not only experiments in mechanized warfare but also with various radio communications schemes and with aircraft to provide reconnaissance and close air support for rapidly moving ground forces. These exercises were indispensable in enabling the German high command to develop a devastating new form of land warfare known as *Blitzkrieg*—lightning war.

Today the United States military finds itself in a period somewhat similar to the one confronted by the two military organizations cited above. As in the interwar era, rapidly progressing (and diffusing) technologies have emerged, laying the groundwork for a military revolution, which will produce dramatic changes in the instruments of war and the way in which military operations are conducted. But as with naval aviation and mechanized ground operations seventy years ago, it is not yet clear how this revolution will play out.

THE CHALLENGE OF POWER PROJECTION

Despite all the uncertainties the US military must confront in preparing for the future, two things seem certain. First, given the United States current military dominance, the incentive is high for would-be adversaries to present the American military with very different challenges than those which US forces confronted during the Gulf War or more recently during Operation Allied Force in the Balkans. Second, the diffusion of military technologies and the rapid progression of

¹³ Robert M. Citino, *Path to Blitzkrieg* (Boulder, CO: Lynne Rienner Publishers, 1999), p. 241.

military-related technologies will increasingly offer such adversaries the means to achieve this goal. This possibility is particularly true with respect to the traditional form of US power-projection operations.

The US ability to maintain stability in key regions around the globe rests on its capacity to project power, rapidly and decisively, where it is needed. As the Defense Department's 1997 Quadrennial Defense Review (QDR), observed, "it is imperative that the United States now and for the foreseeable future be able to deter and defeat large-scale, cross-border aggression in two distant theaters in overlapping time frames"¹⁴ Along these lines, the JCS' vision statement, *Joint Vision 2010*, declared that "power projection . . . will likely remain the fundamental strategic concept of our future force."¹⁵

However, the US military's traditional method of deploying and sustaining air and ground forces at or through major ports and airfields is almost certain to be put at risk as a consequence of major shifts in the geopolitical and military-technical environment. Unlike during the Cold War, it cannot be assumed that allies will provide base access whenever it is needed. Instead ad hoc coalitions, or "coalitions of the willing," must be cobbled together depending on the situation. For example, during Operation Desert Fox in 1998, both Saudi Arabia and Turkey refused to allow US air strikes on Iraq to originate from bases on their soil. Similarly, in 1999, Greece, America's long-term North Atlantic Treaty Organization (NATO) ally, refused to permit US forces to operate from its bases during Operation Allied Force. Most recently, the United States has found unfettered forward base access difficult to come by in the war against al Qaeda terrorist forces and the Taliban regime in Afghanistan. States in the region have, for the most part, either denied the US military access to bases, or placed severe restrictions on their use, especially in the case of strike operations.

Nor can the US military be confident that adequate basing facilities will be available in any event. During the Cold War, the United States developed modern base facilities to optimize the military's ability to execute the containment strategy of the Soviet Union. Correspondingly, the US military developed forces that became dependent on these well-developed facilities in Western Europe and Northeast Asia. But the Cold War is over, and the US military has confronted the harsh reality that basing facilities in many other parts of the world—in places such as Somalia, Rwanda, Albania, and Afghanistan—are austere in the extreme compared to their Cold War era counterparts. Indeed, the US Army's current transformation efforts seem driven, to a great extent, by its recent inability to deploy forces rapidly to the Albania-Kosovo border during the Balkan conflict.¹⁶ Making matters worse, potential flash points, such as the Asian Subcontinent, Spratly Islands and Taiwan Straits, lie in regions that seem geographically bereft of even modest local basing facilities to accommodate the US military's short-range fighter aircraft and medium/heavy ground forces.

¹⁴ *Report of the Quadrennial Defense Review* (Washington, DC: DoD, May 1997), p. 12.

¹⁵ JCS, *Joint Vision 2010*, p. 4.

¹⁶ The principal metric employed by the Army to define its Objective Force brigades concerns their ability to deploy to a forward base within four days. The principal challenge encountered by the Service's Task Force Hawk during Operation Allied Force was its inability to deploy quickly.

Even more disconcerting is the growing proliferation of national and commercial satellite services and missile technology. Increased access to these satellite services will allow even regional rogue states to pretarget key fixed facilities and to monitor US deployments into forward bases.¹⁷ Unless one makes heroic assumptions regarding advances in missile defense effectiveness, these facilities can be held at risk through the employment of large numbers of ballistic and cruise missiles. Senior US military leaders have already voiced strong concern over the ability to deal with such a contingency. General Ronald Fogleman, then Air Force chief of staff, observed that

Saturation ballistic missile attacks against littoral forces, ports, airfields, storage facilities, and staging areas could make it extremely costly to project US forces into a disputed theater, much less carry out operations to defeat a well-armed aggressor. Simply the threat of such enemy missile attacks might deter US and coalition partners from responding to aggression in the first instance.¹⁸

Admiral Jay Johnson, then chief of naval operations, expressed very similar concerns when he declared

Over the past ten years, it has become evident that proliferating weapon and information technologies will enable our foes to attack the ports and airfields needed for the forward deployment of our land-based forces.

I anticipate that the next century will see those foes striving to target concentrations of troops and materiel ashore and attack our forces at sea and in the air. This is more than a sea-denial threat or a Navy problem. It is an area-denial threat whose defeat or negation will become the single most crucial element in projecting and sustaining US military power where it is needed.¹⁹

Perhaps most revealing, however, are the comments of a retired Indian brigadier general, who observed that future access to forward bases

is, by far the trickiest part of the American operational problem. This is the proverbial “Achilles heel.” India needs to study the vulnerabilities and create covert bodies to develop plans and execute operations to degrade these facilities in the run up to and after commencement of hostilities. Scope exists for low cost options to significantly reduce the combat potential of forces operating from these facilities.²⁰

¹⁷ The ability of the world’s militaries to tap into the commercial satellite architecture for targeting purposes is reflected in the Chinese military’s use of US commercial satellite imagery to identify targets in Taiwan for missile attack. Bill Gertz, “China Buys US Satellite Data to Target Taiwan,” *Washington Times*, February 7, 2002, p. 1.

¹⁸ Bill Gertz, “The Air Force and Missile Defense,” *Air Force Magazine*, February 1996, p. 72.

¹⁹ Admiral Jay Johnson, “Anytime, Anywhere: A Navy for the 21st Century,” *Proceedings*, November 1997, p. 49.

²⁰ Brigadier V. K. Nair, *War in the Gulf: Lessons for the Third World* (New Delhi, India: Lancer International, 1992), p. 230.

According to a recent Defense Science Board (DSB) study, a regional power's development of this kind of anti-access capability by 2010 is quite plausible, even given relatively severe resource constraints.²¹ A CINC of US forces in Korea declared that the problem of forward base access is not a problem for the US military of 2010, but one that exists in embryonic form in Korea *today*, and which will only worsen over time.

As Admiral Johnson observed, US maritime forces will also confront new challenges to their ability to project power. The US Navy will increasingly find itself operating in the littoral (i.e., along enemy coastlines, or in "green" waters), for two reasons. First, there are no navies that can challenge the US fleet on the high seas. Second, with forward bases coming under increased risk of destruction from ballistic and cruise missile attack, the fleet will have to move closer to shore to support efforts to defeat anti-access forces and project power against other enemy forces ashore. As this happens, the fleet will encounter so-called area-denial forces in the form of sophisticated anti-ship mines, coastal submarine fleets, onshore high-speed anti-ship cruise missiles and other enemy capabilities that may place the US carrier-centric fleet at high risk of destruction. In short, as the fleet moves from Cold War-era, blue-water sea control to focus increasingly on green-water sea control, it will come within range of more and more of the enemy's military capabilities. Making matters worse, the screening elements that protect the carrier, the Navy's core strike element, will begin to collapse back on the carrier as they encounter the coast line.²² Thus, not only will maritime forces come within range of more enemy systems, their warning time of attack will be reduced as well. The diffusion of weapon systems, such as high-speed, antiship cruise missiles, will reduce warning time even further.²³

As potential adversaries look for ways to deal with US military preponderance, they seem to have little inclination to create their own version of the Iraqi military, as it existed at the time of the Gulf War. Iran, for example, seems far more interested in fielding anti-access and area-denial forces, such as ballistic and cruise missiles, anti-ship cruise missiles, submarines, and advanced anti-ship mines, than the kind of military systems, such as tanks and combat aircraft, that proved largely ineffective for the Iraqis in 1991.

In assessing the emerging threats to US power-projection forces, the NDP, in reporting its findings, unanimously agreed upon the need to "radically alter the way in which we project

²¹ DSB, *Final Report of the Defense Science Board Task Force on Globalization and Security* (Washington, DC: Office of the Under Secretary of Defense for Acquisition and Technology, December 1999), p. vi.

²² The anti-air warfare (AAW) and anti-submarine warfare (ASW) ships that protect the carrier obviously cannot operate on land. As the carrier maneuvers closer to shore in order to strike targets inland, the protective bubble provided by these ships will begin to collapse as they encounter the shoreline. It is important to note that these escorts typically operate at great distances from the carrier when in a warfighting environment. For the sake of example, if a carrier were positioned in Washington, DC, anti-air escorts (such as Aegis cruisers and destroyers) would be positioned as far away as Harrisonburg, Pennsylvania; Trenton, New Jersey; and Norfolk, Virginia. This example is taken from Admiral James D. Watkins, *The Maritime Strategy* (Annapolis, MD: US Naval Institute Press, January 1986), p. 13.

²³ For a discussion of the area-denial threat, see VADM Arthur K. Cebrowski and Captain Wayne P. Hughes (USN, Ret.), "Rebalancing the Fleet," *Proceedings*, November 1999; and Captain Wayne P. Hughes (USN, Ret.), *Fleet Tactics and Coastal Combat* (Annapolis, MD: Naval Institute Press, 2000), pp. 145–68.

power.”²⁴ The NDP concluded that the US military must develop the capability to execute the following missions (among others) within the next decade:

- Inserting and extracting forces in the absence of forward bases;
- Resupplying forward forces through airlift and sealift operations when access to forward ports and airfields is at risk;
- Seizing and controlling key terrain (including urban areas) if our ground forces must operate dispersed; and
- Achieving air superiority against an enemy’s missile force.²⁵

Most recently, the Bush Administration, following its strategic review, declared “projecting and sustaining US forces in distant anti-access or area-denial environments and defeating anti-access and area-denial threats” as one of six “critical operational goals.”²⁶

Despite the injunctions of blue-ribbon defense panels and the directives laid down by senior DoD leaders, there appears to be a major disconnect between emerging threats, such as anti-access/area denial and the capabilities being developed by the Services for dealing with them. For example, the Air Force’s Aerospace Expeditionary Forces (AEF) require access to in-theater air bases in order to project power effectively. Current projections with respect to future sealift and airlift assets indicate they will deploy to, and operate from, the major ports and airfields that would be the principal targets of an adversary’s anti-access forces. Both the Navy and the Marine Corps assume a relatively benign littoral environment in which MV-22s, Advanced Amphibious Assault Vehicles (AAAVs) and non-stealthy surface combatants can operate at little risk to their survivability. The Navy, for example, in its “assured access” concept, makes the critical assertion that the currently envisioned fleet will prevail in an anti-access/area-denial environment—despite little in the way of compelling evidence from the Service’s fleet battle experiments to sustain such an assertion. The Army’s transformation plans seem to assume that forward debarkation points, such as major ports and airfields, will remain sanctuaries from attack and thus enable the free flow and support of ground forces into a threatened region.²⁷ The Air Force’s Global Strike Task Force concept also assumes that enemy anti-access forces can be identified and defeated quickly by a relatively small force of strike aircraft operating at greatly extended ranges.²⁸

²⁴ NDP, *Transforming Defense*, p. 33.

²⁵ *Ibid.*, p. 35.

²⁶ *Quadrennial Defense Review Report* (Washington, DC: DoD, September 30, 2001), p. 30. Hereafter cited as *QDR Report*.

²⁷ The absence of well-developed concepts of operation for dealing with emerging threats is somewhat surprising, given that the Services have conducted major war games and simulations (e.g., the Army’s so-called Spring Wargame; the Navy’s Global game) in which these threats have been encountered.

²⁸ General John P. Jumper, “Global Strike Task Force: A Transforming Concept, Forged By Experience,” *Aerospace Power Journal*, Spring 2001, pp. 24–33; and David A. Fulghum, “USAF Plans Rapid, All-Stealth Task Force,” *Aviation Week & Space Technology*, February 26, 2001, p. 24.

Interestingly, no major joint field exercises have been conducted to determine whether these Service concepts are viable, let alone mutually supporting.

II. THE NEED FOR FIELD EXERCISES

While the US military will likely encounter very different challenges to its power-projection capabilities in the coming years, there is considerable uncertainty with respect to how it should position itself to deal with them. What military systems, both existing and potential, will be needed? What prospective operational concepts will prove effective and which will not? Will new forms of military organization be required, similar to the fast carrier task forces and panzer divisions that transformed warfare in World War II? Will different kinds of people, possessing different skill sets, be needed? These and other related questions require answers if America's military is to play its role in preserving the nation's security.

Unfortunately, the answers to these questions are difficult to ascertain. Priorities will have to be set, and difficult choices made. Simply stated, the Defense Department cannot build a military optimized for every prospective threat. Nor should it proceed with a modernization program that is based on what proved successful in yesterday's wars but which will likely prove far less effective against new challenges.

Yet the Pentagon risks doing precisely that when it undertakes large-scale production of a new land combat system, aircraft or class of ships without having a good understanding of how it will compete against emerging threats. For example, given the anti-access/area-denial case cited above, the following are but a sample of the many issues demanding attention:

- How does the Air Force plan to deploy its short-range tactical fighters to forward bases against the kind of threat described by General Fogleman? How will the Air Force employ these fighters to achieve air superiority against an enemy's dispersed and mobile ballistic and cruise missile forces?
- How does the Army plan to deploy and sustain its interim and objective brigade elements to (and through) large, fixed forward bases when such forward base access is absent, or the bases are at high risk of destruction?
- How does the Navy plan to move its carrier battle groups safely through narrow straits or along the littoral? How will the Navy counter the area-denial threat outlined by Admiral Johnson so as to influence the battle ashore, especially since its new carrier-based aircraft have inferior strike ranges to the aircraft they are replacing?

Field exercises that incorporate experimentation—at both the Joint and Service level—provide an indispensable means for resolving these questions and, in so doing, determining the proper mix of new and legacy systems required to operate effectively against future threats. Military field exercises at the *operational* level of warfare confer several critical benefits, both to defense planners and to those concerned with fiscal accountability. These benefits include:

- ***Reducing Uncertainty in Preparing for Emerging Threats.*** With respect to projecting power in an anti-access environment, Joint and Service field exercises would enable military leaders to explore promising operational concepts for deploying forces into theater, conducting

extended-range precision strikes, determining if secure access to forward bases is possible, and identifying how to sustain the operation for a period sufficient to achieve its objectives. Through such field exercises, commanders can develop a feel for those operations that might succeed in such a threat environment and for the force mix and systems requirements needed to support such operations. This proved to be the case with Germany's development of blitzkrieg. Field exercises enabled the German military to work through the coordination problems associated with fast-moving mechanized formations, other ground formations and supporting air units. Equally important, field exercises also enable military leaders to determine those force elements and modernization plans that will likely diminish in value over time. For example, the Wehrmacht's field exercises in the 1930s helped convince the German Army's leadership that the horse cavalry's glorious epoch was rapidly drawing to a close.

- ***Determining the Proper Mix of Emerging and Legacy Systems.*** Field exercises also assist military organizations in determining those new systems and capabilities that will be required, those existing (or legacy) systems and capabilities that should be sustained, and what kind of mix should be established between the two. The Germans, for instance, used a series of field exercises to experiment with five different mechanized field formations—three of which were eventually adopted. In the case of the panzer division, over the course of these exercises the Germans found their initial design was far too “tank heavy” in proportion to the other elements of the division, such as artillery and engineers. Consequently, the number of tanks in the initial division design was reduced by roughly 50 percent. The proportion of certain supporting forces, such as engineers, was increased. Finally, supporting elements, such as engineers, and legacy systems, such as artillery, were motorized to better enable them to support the tanks' rapid advance.²⁹ In short, exercises proved critical to the Germans' ability to determine the proper mix of new (e.g., panzer, airborne, radio communications, and reconnaissance and attack aircraft) and existing (e.g., artillery, engineers) capabilities required for mechanized air-land operations.
- ***Reducing Uncertainty by Testing and Evaluating a Wide Range of Capabilities.*** Field exercises help identify and refine new forms of military operations and new force elements, which can then be employed relatively quickly if and when a threat emerges. In this way field exercises enable both innovation and transformation. For example, in the case of innovation, one sees that in the early 1960s the US Army conducted extensive field exercises to assess the potential of airmobile and air-assault operations.³⁰ These field exercises gave the Army an important option when, in the summer of 1965, it was ordered to deploy large combat forces to Vietnam. The first division selected for deployment was the Army's newly

²⁹ Werner Haupt, *A History of the Panzer Troops, 1916–1945* (West Chester, PA: Schiffer Publishing, 1990), p. 72.

³⁰ These exercises culminated in the Air Assault I and Air Assault II major field exercises. For a discussion of these exercises, and the related Air Force Goldfire exercises, see Andrew F. Krepinevich, *The Army and Vietnam* (Baltimore, MD: The Johns Hopkins University Press, 1986), pp. 121–27.

formed 1st Cavalry Division (Airmobile).³¹ To be sure, this new division did not overthrow the existing regime in land warfare. Mechanized ground formations retained their primacy. However, airmobile formations did represent a major innovation in land warfare. On a more profound (or transformational) scale, the US Navy's series of fleet problems enabled that Service to develop the principles of the fast carrier task force, which did supplant the battleship battle line as the dominant maritime formation for command of the seas. As a consequence of the fleet problems conducted during the 1920s and 1930s, when the battles of Coral Sea and Midway in 1942 clearly revealed the transformation of war at sea, the Navy was able to adapt quickly to conduct fast carrier task force operations.

- ***Generating Successes that Sustain Momentum for Transformation and Innovation.*** One reason why military transformations typically require a decade or so to bring about is that they must overcome the resistance of large organizations to major change. This is especially true with respect to the US military, which must contend with the additional burden of its remarkable success, and which today is undisputedly the world's premier fighting force. Thus, aside from convincing the US military that transformation is necessary, its members, especially the officer corps, must also be convinced that transformation is possible, and that the military is proceeding down the right transformation path. Properly structured field exercises, involving actual forces in an environment that is as close to actual operations as possible, are arguably unsurpassed in their ability to generate support, and even enthusiasm, for transformation within the officer corps. The *Saratoga's* raid on the Panama Canal in Fleet Problem IX and the 3rd Panzer Division's performance in the German Army's North German Plain maneuvers convinced many of the officers that witnessed the exercise—in a way that no war game or simulation ever could have—that they were onto something special, that a dramatically new and more effective way of conducting military operations was indeed possible.³²
- ***Complicating the Planning of Would-Be Enemies.*** Field exercises that enable the US military to buy options on emerging capabilities can also greatly complicate the planning of would-be adversaries. For example, in the 1930s the Imperial Japanese Navy was forced to plan against a US Navy that was exploring a range of options for exploiting the potential of naval aviation, to include the deployment of large (e.g., *Saratoga* and *Lexington*) and small (e.g., *Ranger*) carriers, the use of sea planes, airships, and land-based aircraft, as well as proposals for launching a class of flying-deck cruisers. By enabling the creation of a range of capabilities and warfighting options, experimentation can compel would-be adversaries to stretch their limited resources thin, or to take the high-risk option of focusing their efforts on

³¹ The Army also considered fielding an Air Cavalry Brigade formation. For a discussion of the rise of airmobile/air assault forces in the US Army, see Krepinevich, *The Army and Vietnam*, pp. 112–27. See also J. Kristopher Keener, *The Helicopter Innovation in United States Army Aviation* (Cambridge, MA: MIT, March 2001).

³² The same tends to be true of transformation in other large, competitive organizations. For example, see John Kotter, "Leading Change: Why Transformation Efforts Fail," *Harvard Business Review*, March-April 1995, pp. 59–67. Kotter emphasizes the importance of creating "short-term wins." He notes that "Most people won't go on in the long march unless they see compelling evidence within 12 to 24 months that the [transformation] journey is producing expected results." Similarly, field exercises can do much to convince the officer corps that new warfare challenges are real and that there are innovative ways of dealing with them.

offsetting only one or a few of the new warfighting options. Ideally, when confronted with this dilemma, potential adversaries would find themselves dissuaded from entering into a military competition in the first place.³³ This benefit of field exercises linked to experimentation and transformation seems likely to play an increasingly important role in the Bush Administration's new defense strategy, which places high priority on dissuading would be adversaries from challenging US military dominance.³⁴

- **Identifying Intra-Regime Shifts.** Save warfare itself, field exercises appear to be the best way to maintain an awareness of significant shifts in the character of military competition that sometimes occurs during periods of transformational change, but which are not themselves revolutionary. The US Navy's series of exercises and fleet problems conducted during the period between the world wars identified several such shifts. Tests on the battleship *Texas* in 1919 showed that aircraft acting as spotters greatly enhanced the battle line's accuracy at extended ranges. Thus, while the carrier had not displaced the battle line, it had nevertheless become indispensable to its effectiveness. Ten years later, Fleet Problem IX showed that carriers could function as a significant strike force in a raid, even though they still had not displaced the battle line as the arbiter of sea control. It was not until the fleet problems of the late 1930s that a substantial number of naval officers became convinced that carrier-based aircraft might be true ship killers. In the absence of such fleet exercises, it is doubtful the Navy would have either identified these shifts in the military competition, or adapted to them as quickly and as well as it did.

Similarly, field exercises today that orient the US military on addressing the anti-access and area-denial threats might reveal important intra-regime shifts. For example, if a transformation of warfare is on the horizon, its end state might be one in which it becomes prohibitively costly to deploy, sustain and operate US forces from large, fixed forward bases, such as major ports and advanced air bases. It may also be possible, however, for the US military to transform itself so that it could still project decisive force in the absence of such base access. Assuming such a post-transformation endpoint, it would be very useful to know

³³ Again, the highly competitive corporate sector offers instructive insight. The ability and the will to produce a range of capabilities can greatly complicate an adversary's ability to compete. A classic example is the war waged between Honda and Yamaha for supremacy in the motorcycle market, known in Japanese business circles as the "H-Y War." Yamaha was the "aggressor," in that it built a factory that would enable it to become the world's largest motorcycle manufacturer. The key to Honda defeating this challenge was its ability to rapidly increase the rate and range of change in its product line, which it used to bury Yamaha. At the war's start, both firms had roughly 60 models of motorcycles. Over the next 18 months, Honda introduced or replaced 113 models, turning over its product line twice, while Yamaha could manage only 37 changes during that same time period. This parallels in rough fashion the US Navy's development of a wide range of naval aviation "products" during the interwar years, and its ability to move rapidly to place them into the wartime "markets" (i.e., mission areas) where they were required. See George Stalk, Jr., "Time—The Next Source of Competitive Advantage," *Harvard Business Review*, July-August 1988, pp. 44–45.

³⁴ The administration's QDR report declares "dissuading future military competition" to be one of its four fundamental defense policy goals. It declares that dissuasion will require the United States military to "experiment with revolutionary operational concepts, capabilities, and organizational arrangements . . ." *QDR Report*, pp. 11–12.

whether, along this transformation path, there exist important transitory regimes that, although fleeting, represent an important change in the power-projection competition.

For instance, depending upon the relative success enjoyed by those militaries seeking to develop anti-access capabilities and those seeking to defeat them, one side or the other might gain an advantage for a limited period of time. If anti-access capabilities gain the upper hand, this would be important to know, lest US forces find themselves confronted with latter-day versions of Omaha Beach, Anzio and Tarawa as they attempt to deploy and sustain themselves through major forward bases. If, on the other hand, US transformation initiatives enable power-projection forces to gain a clear (albeit evanescent) advantage, it would be important to know, both for deterrence and warfighting purposes. For instance, at some point in its transformation the US military might have created, in essence, a spearhead force capable of swiftly defeating a nascent anti-access threat, thereby enabling the prompt, effective use of follow-on legacy forces in more traditional operations.³⁵ Obviously, the matter of whether such a capability does, in fact, reside within the US military would be of critical importance. As the US Navy's fleet problems indicate, properly designed and executed field exercises offer perhaps the best opportunity to identify and monitor whether the US military possesses a spearhead capability and to determine when intra-regime shifts are occurring.

- ***Avoiding Premature Large-Scale Production***

- ***Avoiding False Starts.*** Field exercises, especially those that incorporate experiments, can help military organizations avoid buying large quantities of a promising system too early during a period of transformational change in military capabilities. The US Navy's first carrier designed from the keel up, the *Ranger*, was commissioned in 1934. Although some Navy leaders had pressed for construction of five *Ranger*-Class carriers, war game analysis and fleet problems soon indicated that, at roughly 14,000 tons, the *Ranger* was far too small to meet many of the demands of future fleet operations. As it turned out, the *Essex*-Class carriers that formed the backbone of the Navy's fast carrier task forces in World War II each displaced nearly twice as much tonnage as the *Ranger*.
- ***Avoiding Dead Ends.*** Military systems or capabilities that appear promising, or even revolutionary, sometimes fail to live up to expectations. In this case, the challenge of those leading the transformation effort is not to avoid buying them too early, rather, it is to avoid buying them *at all*. The experience of the US Navy during the development of naval aviation in the interwar period again provides an example of how rigorous experimentation and field exercises can help avoid dead ends. In 1930 the Navy's Bureau of Aeronautics proposed the construction of eight 10,000-ton flying-deck (or flight-deck) cruisers. The ships—half cruiser and half flight deck—were subjected to war game analysis at the Naval War College and some experiments employing surrogates in the

³⁵ In fact, the US military's possession of such a capability appears to be a key assumption of the Air Force's Global Strike Task Force, the Navy's Assured Access, and the Army's Objective Force warfighting concepts.

fleet. Both painted a distinctly unfavorable picture of the hybrid ship, and it quickly sank beneath the Navy's programmatic waves.

- ***Identifying and Solving Practical Problems.*** Although important in their own right, planning exercises, simulations and war games can only go so far in identifying new forms of operation and new military system requirements.³⁶ Indeed, even the best war games have serious limitations.³⁷ War games can be very helpful in providing useful insights; however, they do not offer the detailed level of resolution obtained from well-designed and executed field exercises. This drawback is critical for in war, as with many other things, the devil is often in the details. For example, war games conducted at the Naval War College in the early 1920s indicated the importance of maximizing carrier aircraft compliments and aircraft sortie rates.³⁸ It was not, however, until a prototype carrier (the *Langley*) was launched that the Navy could determine precisely how this goal was to be achieved (or, indeed, whether it could be achieved at all). Under Captain Joseph Reeves, the *Langley* conducted a series of exercises and experiments that led to such innovations as crash barriers and the deck park, which enabled the ship to more than double its aircraft complement and dramatically increase its sortie rate.³⁹ Similarly, the German Army's field exercises and operations in the late 1930s enabled it to solve critical issues with respect to fuel and spare parts requirements for its panzer formations, and the means by which the German Air Force, the Luftwaffe, would function as a highly mobile source of reconnaissance and fire (close air) support. Field exercises like these were essential to both militaries' efforts to transform to dominate the emerging conflict environment.

³⁶ As noted earlier, planning exercises, simulations and war games are important analytic tools that can greatly enhance the effectiveness of field exercises by identifying those promising capabilities that merit prototyping, those new force elements that should be established, and operational concepts that merit the detailed evaluation that only field exercises can provide. Thus these analytic devices serve as a filter to enhance the focus and value of field exercises. This is critical as field exercises are far more costly to undertake (and thus are conducted far less frequently) than war games, simulations or planning exercises.

³⁷ For an overview of war game limitations, see Sydney J. Freedberg, Jr., "Inside the Pentagon's Newest War Games," *National Journal*, April 7, 2001, p. 1048.

³⁸ A sortie is one mission flown by one aircraft.

³⁹ Norman Friedman, "The Aircraft Carrier," in *The Eclipse of the Big Gun: The Warship, 1906–1945*, ed. Robert Gardiner, (Annapolis, MD: Naval Institute Press, 1992), p. 39; and Reynolds, *Admiral John H. Towers*, p. 205.

III. TRANSFORMATION AND FIELD EXERCISES

How well is the Defense Department doing in its efforts to secure the benefits of field exercises to support its transformation efforts? Given the characteristics of field exercises in previous instances of successful military transformation, it would seem that a Defense Department field exercise/experimentation initiative should be defined by *all* of the following characteristics:

- A compelling vision of the future warfighting environment, to include identifying the key challenges and opportunities at the operational level of war;
- A critical mass of key senior civilian and military leaders committed to field exercises oriented on military transformation;
- A sense of urgency regarding the need to conduct field exercises/experiments as soon as possible;
- A willingness to sustain the conduct of field exercises/experiments oriented on transformation on a regular basis throughout the period of transformation;
- A determination to conduct such field exercises/experiments at all levels of warfare—tactical, operational and strategic—and among all the principal organizations involved (e.g., the Services, allies, other relevant governmental and nongovernmental organizations); and
- A willingness to increase substantially the resource level for joint field exercises.

A COMPELLING VISION

All transformation efforts, to include transformation field exercises, need to be informed and guided by a compelling vision of how future military competitions will be different from those that dominate warfare today. Put another way, the US military leadership must provide a compelling answer to the question, “Why should the world’s best military transform itself?”

Military organizations that have successfully undergone transformation benefit greatly from a clear statement of how the post-transformation conflict environment will differ from the pre-transformation environment. For instance, in laying down his vision of future warfare, General Hans von Seeckt rejected the German Army’s World War I experience when he declared that mass armies had become “cannon fodder for a small number of technicians on the other side.” Consequently, he argued, “The goal of modern strategy will be to achieve a decision with highly mobile, highly capable forces, before the masses have begun to move.”⁴⁰ Thus were the roots of blitzkrieg established. Similarly, the US Navy’s Admiral William S. Sims left little doubt as to

⁴⁰ Robert M. Citino, *The Evolution of Blitzkrieg Tactics: Germany Defends Itself against Poland, 1918–1933* (New York: Greenwood Press, 1987), p. 71.

the how the character of warfare at sea would undergo a transformation when he predicted in 1925 that a “high-speed carrier alone can destroy or disable a battleship [T]he fast carrier is the capital ship of the future.”⁴¹

Regrettably, current Joint and Service vision statements do not present a similar compelling vision for transformation either at the Joint or individual Service level. The JCS’ vision, set forth in *Joint Vision 2010*, and sustained in *Joint Vision 2020*, speaks in general terms of the need to achieve positional advantage over an adversary (“dominant maneuver”), engage the enemy effectively (“precision engagement”), support such activities efficiently and effectively (“focused logistics”) while protecting friendly forces (“full-dimensional protection”).⁴² While these are desirable qualities for the US military to pursue, they offer little in the way of guidance as to how its missions (i.e., the character of key military competitions) might change over time (e.g., projecting power against an adversary possessing anti-access forces; defending against asymmetric attacks on the US homeland). Indeed, stripped of their adjectives, the characteristics of effective “maneuver,” “engagement,” “logistics” and “protection” would be those desired by *any* military organization, in *any* era.

Take the example of the US Army, arguably the most aggressive of the four Services in pursuing transformation. The Army’s vision, “Soldiers on point for the Nation . . . persuasive in peace, invincible in war,” may be seen as a general mission statement or slogan. But it is not a vision of how warfare will be different in the future. The apparent driver of the Army’s “transformation” is not a newly emerging threat, but the perceived need to respond to existing threats *more quickly* (i.e., the ability to deploy a combat-ready brigade in 96 hours and a division in 120 hours).⁴³ The Objective Force called for by this vision will purportedly embody the following characteristics: responsive, deployable, agile, versatile, lethal, survivable, and sustainable.⁴⁴ Again, as with *Joint Vision 2020*, all would agree that these force characteristics are desirable for the future Army (or *any* army at *any* point in history, for that matter). But a compelling vision would explain how these characteristics would be realized against prospective adversaries in post-transformation contingencies (i.e., those that will arise out of the new vision of warfare). With regard to deployability, for example, we might ask: How is the Army going to be more rapidly deployable in an anti-access environment? Important answers concerning how to defeat this asymmetric challenge might come from Service and Joint field exercises.

⁴¹ Reynolds, *The Fast Carriers*, p. 1.

⁴² JCS, *Joint Vision 2020*, p. 13; and JCS, *Joint Vision 2020*, pp. 20–27. To be sure, *Joint Vision 2020* notes the risks from changes in the conflict environment brought about by adversaries pursuing asymmetric strategies. The Joint Chiefs go on to say that such strategies are “perhaps the most serious danger the United States faces,” that asymmetric advantages may be pursued on any level of warfare—strategic, operational or tactical—and that “adversaries may pursue a combination of asymmetries” The reader is further instructed that “asymmetric threats are dynamic and subject to change, and the US Armed Forces must maintain the capabilities necessary to deter, defend against, and defeat any adversary who chooses such an approach.” Yet despite these general statements of concern there is little in the way of detailed discussion as to what form (e.g., anti-access, area denial) asymmetric threats might take. JCS, *Joint Vision 2020*, pp. 4–5.

⁴³ Colonel Daniel Gerstein, “Army Transformation,” Information Paper, DAMO-SSV, November 9, 2000.

⁴⁴ *Ibid.*

Similarly, the Army also has the potential to field forces that can both identify and engage an adversary at far greater ranges and with increased lethality than has ever been possible before. The Army possesses today many of the elements of such a deep-strike force, to include both the long-range reconnaissance components (e.g., unmanned aerial vehicles (UAVs), scout helicopters, long-range reconnaissance teams, and some access to the other Services' reconnaissance systems) and strike components (e.g., rocket artillery, attack helicopters and surrogates for unmanned combat air vehicles or UCAVs). If field exercises proved the value of such a formation, it could provide the Army with a great competitive advantage over any other army in the world.

Finally, the vision would provide those charged with effecting transformation with a sense of the priorities among these force characteristics. Trade-offs are difficult to avoid among desirable characteristics. For example, the Army is attempting to become lighter in order to become more deployable, which historically has often also meant decreased survivability and lethality. Which desired capabilities have priority? What are the minimal acceptable performance characteristics beyond which trade-offs are not permissible? How does the Army know with confidence it is drawing the correct conclusions regarding these trade-offs, in the absence of rigorous field exercises oriented on the future operational (e.g., anti-access/area-denial) environment? Recall that the German Army, in developing the panzer division, made major modifications in the division's design—to include the mix of combat arms, supporting arms and weapon systems—as a consequence of its experience in field exercises. Moreover, the Germans conducted field exercises/experiments with five different mechanized formations, contrasted to the US Army's single Interim Brigade Combat Team (IBCT) formation. The “vision problem” is not unique to the Army; to a greater or lesser extent, the other Service visions suffer from similar maladies.

In summary, the absence of a compelling vision undermines transformation in two ways. First, it fails to provide a clear, persuasive justification for change. Second, it fails to state what will guide (or drive) change. Under these circumstances, “transformation” can easily lead military leaders to focus on improving current forms of operations to meet enhanced variations of existing threats, when the threat is actually changing in substantial, and perhaps fundamental, ways.

A CRITICAL MASS OF KEY DECISIONMAKERS

Military transformation—and the field exercises oriented towards that goal—to date has lacked the critical mass of support from senior military and civilian leaders that has characterized successful transformation efforts in the past. Moreover, by its nature, dramatic change in large military organizations almost inevitably involves a long-term process that spans a decade or more. However, the US military's institutional practices typically find senior leaders rotated out of their assignments every three or four years. While this rotation cycle may work well for leaders whose responsibilities are near-term oriented (for example, the regional CINC who is responsible for the immediate warfighting mission in his area of operation), the transformation mission is one that can be accomplished only over a relatively long period of time.

It is not surprising, then, that military organizations that have successfully transformed have almost always had a few key senior leaders serve an extended tour of duty, often double or even

triple the length of a typical flag (i.e., general or admiral) officer tour in today's US military. During the German Army's transformation to blitzkrieg, for example, the head of its shadow general staff, General Hans von Seeckt, served seven years in that position. The American Navy's exploitation of naval aviation was shepherded by Vice Admiral William Moffett, who remained head of the Navy's Bureau of Aeronautics for twelve consecutive years. On the other hand, the tour of duty for the CINCFJCOM remains the same as those for CINCs who are primarily responsible for meeting immediate warfighting requirements. The absence of extended tours of service for transformation-minded senior US military leaders serving in key positions (e.g., CINCFJCOM) should give pause to those who are concerned about joint transformation field exercises in particular and the prospects for transformation in general.

A SENSE OF URGENCY

If history is any guide, and if the Defense Department is serious about transforming the US military, then field exercises oriented on that goal must be initiated now and conducted on a frequent basis. Moreover, funding, forces and equipment (to include rapidly prototyped equipment and surrogates) must be made available to support these exercises.

Recall that during the interwar period of the 1920s and 1930s, the US Navy conducted twenty-one fleet problems involving large elements of the fleet. Some fleet problems were so extensive that they comprised several major phases, each of which could have been viewed as an independent exercise. The German Army continually found ways to conduct substantial field exercises even during Germany's period of disarmament from 1919–35. Following the onset of rearmament, the German military moved quickly to conduct the largest field exercises of the interwar period, while concurrently conducting major operations in the Spanish Civil War.

Both of these militaries were animated by a sense of urgency among their military leaders that rapid (and perhaps profound) changes in the threat environment or character of the conflict were possible, if not imminent. The US Navy was acutely aware of the growing challenge posed by the Imperial Japanese Navy, both in terms of its growing strength and its efforts to exploit the potential of naval aviation. The German Army was driven by the need to avoid a protracted war of attrition on multiple fronts, the type that led to its defeat in World War I. This led to the Wehrmacht's vigorous efforts to exploit rapidly advancing technologies (i.e., automotive, aviation, radio) to restore mobility to the battlefield. The urgent need to keep pace with the competition, to determine as best as possible the direction warfare was headed, and to reduce uncertainty about what new (and legacy) capabilities would prove effective (and which would not), led these innovative militaries to exploit the potential of field/fleet exercises with a keen sense of urgency.

Today the warnings of military leaders like General Fogleman and Admiral Johnson—not to mention those of the National Defense Panel and Defense Science Board—connote a similar sense of urgency with respect to the US military's need to begin now to prepare for emerging threats and to exploit potential opportunities. Sadly, the events of September 11 only serve to reinforce that the character of conflict is transforming once again, and that even the US military must transform to maintain its competitive position. Unfortunately, the current US military leadership's rhetoric asserting the need for transformation (and the field exercises to support and

inform it) has not been matched by a similar sense of urgency or any substantial resource support. Recall that the establishment of JFCOM for the purpose of undertaking joint exercises and experimentation was not a Defense Department initiative. Rather, it was the consequence of congressional leadership and the recommendations of an independent panel of experts.⁴⁵ Absent congressional pressure, the command's first major exercise, Olympic Challenge, was not scheduled to occur until 2004, some six years after being tasked with the responsibility for joint experimentation.

In any event, the current approach to employing field exercises as a central means of guiding and informing transformation stands in stark contrast to the sense of urgency that has historically characterized successful military transformations. Consequently, it is difficult to conclude the Defense Department's effort to date represents a vigorous attempt to exploit the potential of field exercises to support the transformation process.

SUSTAINED EFFORT

Field exercises must be an enduring element of the US military's transformation strategy. Not only must they be initiated promptly, they must also be sustained, typically over a protracted period of time, to effect transformation.

Several Services deserve credit for attempting to develop a long-term approach to field exercises oriented on transformation. The Marine Corps, for example, has conducted a series of exercises and experiments under the rubric of Sea Dragon, which includes the Hunter Warrior, Urban Warrior and Capable Warrior activities. One of their more innovative efforts involved an attempt to work the problem of providing close air support in an urban environment. The Marines commissioned the construction of an Urban Close Air Support Facility at their Air Station in Yuma. The complex includes over 150 buildings constructed from shipping containers and empty cluster bomb unit containers. The buildings range in size from one to five stories, and are configured in various shapes. These are modest steps, to be sure, but ones that could be encouraged by a comprehensive Defense Department effort to exploit experimentation in support of transformation.

The Marines apparently intend to pursue these efforts on an enduring basis as a means for preparing to meet emerging challenges, while looking for ways to exploit advances in technology to support future operations. While the principal focus of these exercises is at the tactical level of warfare, the Marines apparently hope to begin addressing post-transformation challenges at the operational level.⁴⁶ As one Marine general put it, "How do we sustain our forces in a world that

⁴⁵ See NDP, *Transforming Defense*, pp. 68–72.

⁴⁶ The General Accounting Office (GAO) criticized the Defense Department's (and, by implication, the Marine Corps') urban warfare exercise effort as being too focused on the tactical level of war, while giving insufficient attention to the strategic and operational warfare concepts that would inform how tactical operations would be conducted. The report challenged the Marines to address the gaps in urban operation capabilities that were identified in earlier Marine Corps exercises. The Marines' response was Project Lincolnia, which involved a series of war games that culminated with a field exercise in August, 2001. The exercise, set in 2004, was conducted at the Marine Corps base at Quantico, Virginia. It explored US peacekeeping operations in the fictional city of Lincolnia.

will feature fewer and fewer overseas land bases and where a large build-up of supplies and equipment ashore may be impractical because of geographical, political or threat conditions?”⁴⁷ Recent events in Afghanistan have made this question most prescient.

COMPREHENSIVE

Although primary emphasis should be placed at the operational level, field exercises and experimentation should take place at *all levels* (tactical, operational and strategic) of warfare and also among *all principal organizations* involved, to include each of the Services and, where appropriate, other governmental and non-governmental elements.⁴⁸ This requires a substantially greater level of effort on the part of the Defense Department. To date, field exercises and experimentation, such as the Marine Warrior series, have been heavily weighted toward the tactical level of warfare. While these efforts are desirable, they must be informed by how military organizations believe they will have to fight at the strategic and operational levels of warfare (see below).

For example, the JFCOM’s first simulated experiment involved attacking critical mobile targets, such as mobile ballistic and cruise missile launchers, that could hold US forward bases at high risk of destruction. However, the ways in which the military might accomplish this task are greatly influenced by considerations at the operational level. The experiment’s conduct—and outcome—could change dramatically if it was assumed that forward bases were either unavailable to US forces or that operating US forces from these bases prior to defeating the anti-access threat would place them at unacceptable risk (e.g., from the very anti-access forces that are the target of US operations). How the military goes about solving the critical mobile targeting and engagement problem at the tactical level is thus influenced enormously by operational level factors. Consider the recent operations in Afghanistan to destroy both fixed and critical mobile targets in the form of Taliban and al Qaeda forces by combining special operations forces on the ground with air strikes. Owing to a lack of forward base access, in this conflict the workhorse arm of US airpower—short-range, land-based tactical fighter-bombers—had to sit on the sidelines while long-range bomber and naval strike aircraft predominated. In sum, experimentation and field exercises that focus on the tactical level of warfare in the absence of

Surrogate equipment, such as small robots equipped with cameras, was used to simulate desired capabilities. Despite these positive developments, however, the Marines’ efforts remain focused at the tactical level of warfare. “Project Lincolnia Says DoD, State Dept. Should Focus on Urban Ops,” *Inside the Navy*, February 26, 2001, p. 3; “Recon Network, Unmanned Systems Gain Steam in Recent War Game,” *Inside the Navy*, February 26, 2001, p. 3; Kim Burger, “USMC Exercise Aims to Fill Gap in Urban Warfare Tactics,” *Jane’s Defence Weekly*, August 22, 2001.

⁴⁷ LTG John E. Rhodes, “Concerning Marine Corps Experimentation Efforts,” Statement before the Senate Armed Services Committee, Emerging Threats and Capabilities Subcommittee, October 20, 1999.

⁴⁸ One growing challenge confronting the US military concerns its role in defending the American homeland from the covert introduction and deployment of chemical, biological or radiological agents, and from electronic attack on the national information infrastructure. Exercises oriented on addressing this threat should logically involve those nonmilitary institutions and organizations that would play a significant role in dealing with an actual contingency (e.g., the Federal Bureau of Investigation (FBI), Coast Guard, state and municipal governments, private industry, etc.).

considering the requirements imposed by the military competition at the operational level risk arriving at irrelevant, or impractical, solutions to accomplishing the mission.

The US military plans to fight as a joint force, drawing upon all the Services' capabilities. This makes sense as modern technology has enabled each of the Services to operate far outside its traditional battle space and into the battle space of its sister Services. Joint field exercises and experiments should therefore encourage a friendly, but spirited, competition among the Services to determine the proper mix of Service capabilities required to conduct joint operations. To its credit, the Army expanded the major field exercise on urban operations it had planned for September 2000—now known as the Joint Contingency Force Advanced Warfighting Experiment or Millennium Challenge 2000—to include participation from the other three Services as well as the staff of JFCOM.⁴⁹ Once again, however, this represents more of a bottom-up approach by the Services than top-down guidance and support from senior DoD leaders.

FOCUSED AT THE OPERATIONAL LEVEL OF WARFARE

While field exercises designed to identify and exploit promising paths toward military transformation must be vigorous, sustained and comprehensive, history also indicates that their principal focus should be oriented on meeting challenges (or exploiting opportunities) at the operational level of warfare. Moreover, such field exercises must be directed at preparing forces for the challenges of the next war, not at becoming more proficient at waging the last one. Concepts of operation for dealing with emerging threats can be viewed as the point in transformation where the rubber meets the road. Such new concepts, particularly in their early forms, represent educated judgments about what new mix of force elements and capabilities will be required to operate effectively in the new competitive environment. As such, they constitute a very significant initial effort to identify the winners and losers that will emerge out of military transformation.

As noted above, failing to take these factors into consideration runs the risk that field exercises will arrive at some very good solutions to the wrong problems. This, regrettably, is all too often the case with current field exercises. To be sure, some progress has been made. There is growing acceptance within the US military of the anti-access and area-denial threats to US power-projection capabilities. Recent Air Force and the Navy concept development efforts have noted the multi-layered threat to large, fixed, forward bases and to forces operating in the littoral.⁵⁰ The

⁴⁹ Millennium Challenge 2000 involved the four Services conducting separate exercises and experiments within the same overall scenario, which was intended to exploit the lessons learned and the challenges arising from the war in Kosovo. The scenario involved defeating an attack by the fictional People's Democratic Republic of Atlantica against the peaceful island state of Cortina, a US ally. The Army exercise was called the Joint Contingency Force Advanced Warfighting Experiment. The Marine Corps' exercise was named Millennium Dragon, while the Air Force element was dubbed the Joint Expeditionary Force eXperiment (JEFX) 2000. The Navy's participation was under the exercise rubric of Fleet Battle Experiment Hotel. Christian Lowe, "In First, Services Run Their Battle Experiments Jointly," *Defense Week*, (September 11, 2000, p. 1.

⁵⁰ Colonel Steve Pennington, "Creating Tomorrow's Military: Role of USAF Experimentation," Briefing, JFCOM, Virginia Beach, VA, December 13, 2000; and Commander Mike Corrigan, "Naval Warfare Development Command," Briefing, JFCOM, Virginia Beach, VA, December 13, 2000.

Marines have identified urban control and eviction operations (Projects Metropolis and Lincolnia) and consequence management operations in defense of the US homeland (Project Atlanta) as emerging challenges. JFCOM is attempting to focus its next major field exercise, Millennium Challenge 2002 (MC 02), on the anti-access/area-denial threat.

While encouraging, the acknowledgement of new challenges/missions at the operational level of warfare begs the question of whether JFCOM or the Services are:

- Orienting themselves on refining new operational concepts, force elements and capabilities to deal with these challenges;
- Structuring war games and field exercises so that existing and projected capabilities actually confront these challenges in a realistic manner; and
- Altering existing requirements in order to better enable them to meet these new challenges.

Indications are that, as it has with terms like the “Revolution in Military Affairs,” and “Transformation,” the US military has done far better at adopting the terminology associated with emerging operational challenges than it has in coming to grips with them. Indeed, the concepts of operation currently under consideration by JFCOM and some military services for dealing with the anti-access/area-denial challenges do not appear particularly promising. For instance, JFCOM’s centerpiece operational concept—Rapid Decisive Operations (RDO)—is designed to “achieve rapid victory by attacking the coherence of an enemy’s ability to fight.”⁵¹ The RDO concept essentially continues the elusive (albeit worthwhile) quest to pinpoint an adversary’s center of gravity to facilitate its prompt neutralization or destruction. To be sure, opportunities should be sought to improve the military’s strategic-strike capabilities, *but within a post-transformation threat environment*. It does little good, for example, to base RDO concepts and capabilities on assured access to in-theater bases and the littoral before the means and methods to defeat anti-access/area-denial threats have been identified and established.⁵²

⁵¹ Colonel Chris Shepherd, “Joint Concept Development and Experimentation Program Overview,” Briefing, JFCOM, Virginia Beach, VA, December 13, 2000.

⁵² JFCOM has declared RDO to be “the major integrating concept for Joint Experimentation.” Captain David W. Prothero and Major General Dean W. Cash, *Rapid Decisive Operations: Initial Concept Report, FY 2000*, (JFCOM, n.d.) p. iii. JFCOM’s official definition of RDO is “A concept to achieve rapid victory by attacking the coherence of the enemy’s ability to fight. It is the synchronous application of the full range of our national capabilities in timely and direct-effects based operations. It employs our asymmetric advantages in the knowledge, precision, and mobility of the joint force against his critical functions to create maximum shock, defeating his ability and will to fight.” Otto Kreisher, “The Quest for Jointness,” *Air Force Magazine*, September 2001, p. 74. The strong links between rapid decisive operations and strategic bombardment of the enemy center of gravity can be seen in Major General David A. Deptula, *Effects-Based Operations: Change in the Nature of Warfare* (Arlington, VA: Aerospace Education Foundation, 2001). The paper, authored by one of the Air Force’s preeminent strategists, notes that “[a]ctions to induce specific effects rather than simply destruction of the subsystems making up each of these strategic systems or ‘centers of gravity’ is the foundation of the concepts of parallel war, rapid decisive operations, or any other concept that seeks to achieve rapid dominance over an adversary.” Deptula, *Effects-Based Operations*, p. 6. In brief, effects-based targeting is premised on the belief that it is possible to reduce dramatically the time it takes to disable an

As one JFCOM analyst put it, the effects-based planning that enables RDO “would allow Desert Storm effectiveness with fewer combat systems.”⁵³ The requirement stems from the realization that “future strategic lift will be insufficient to move forces and materiel such as was employed in the Persian Gulf War.”⁵⁴ Hence the principal challenge is overcoming strategic lift limitations to prosecute existing operations more effectively and not defeating the enemy’s anti-access/area-denial threat.

To use a Service-specific example, one could take the Air Force’s JEFX 99, which involved the rapid deployment of an AEF to fixed, forward bases.⁵⁵ This operation was undertaken despite cautions from military leaders and expert advisory groups that attempting to operate out of such bases will be a risky proposition until enemy missile forces have been neutralized. To its credit, the Air Force has since provided the outlines of how a strike campaign, named “Global Reconnaissance Strike” (and involving Global Strike Task Forces), might be waged in an anti-access/area-denial environment. The Air Force’s concept of operation emphasizes the early use of long-range bombers, sea-based missile forces, space-based assets, and a small force of in-theater assets.⁵⁶ While an important first step, the Air Force’s concept does not detail, save in the most rudimentary way, how the anti-access challenge will be defeated. Nor are there any indications when this concept will be employed realistically in Service or Joint field exercises.

There are two explanations that suggest why we have, thus far, seen so little in the way of specifics when it comes to concepts of operation. First, presenting detailed operational concepts for dealing with the anti-access/area-denial threat and other challenges (e.g., space control, urban control) would inevitably lead to a significantly different force structure and systems requirement mix than found in the current force, which still baselines itself primarily on the decade-old Gulf War contingency or on Cold War-era forward presence requirements and force elements. As noted earlier, an operational concept that calls for US forces to project decisive power, if need be, *independent* of access to large, fixed, forward bases would generate a different set of winners and losers within and among the Services’ force elements and programs. By identifying losers within its own projected force, a Service runs the risk of having these programs attacked by other Services competing for limited resources. It also may encounter opposition from its own subcultures that stand to see their relative stature within the Service decline. Furthermore, during

adversary’s strategic center of gravity. This can be accomplished through two means. First, a greatly enhanced understanding of the cause-and-effect relationship between targets destroyed and the effect this has on “vital enemy systems” that “are relied on by an adversary for power and influence—leadership, population, essential industries transportation and distribution, and forces.” *Ibid.* Second, the ability of precision weapons to disable many types of targets much more rapidly at much lower cost than is possible through the employment of non-precision weapons (or “dumb bombs”).

⁵³ LTC Thomas M. Cooke, USA (Ret.), “Reassessing Joint Experimentation,” *Joint Forces Quarterly*, Spring/Summer 2001, p. 103.

⁵⁴ *Ibid.*

⁵⁵ William H. McMichael, “Joint Experiment in Expeditionary Force,” *Air Force Magazine*, January 2000, pp. 46–50.

⁵⁶ See General Richard E. Hawley, “Global Reconnaissance Strike,” *Armed Forces Journal International*, June 2000, pp. 52–57.

the Clinton Administration the senior civilian DoD leadership placed its principal emphasis on reconciling the enduring problem of a defense posture that was too ambitious to be sustained by projected budget estimates. Consequently, the Services were neither encouraged nor incentivized to address these challenges aggressively. Whether or not this will change under the Bush Administration remains to be seen.

The absence of specificity and alternatives with respect to current Service concepts of operation is reflected in the absence of a healthy competition among the Services to determining the new force structure, system and program changes required to transform the US military. This is regrettable, as inter-Service competition along these lines could provide a strong impetus for generating the innovation required to enable transformation.

IV. THE STRUCTURE AND SUPPORT OF JOINT FIELD EXERCISES

The planning now under way at Joint Forces Command to accelerate its joint field exercise efforts is an encouraging, albeit modest, step in the right direction for transformation. The command had originally planned to conduct its first major exercise, Olympic Challenge, in 2004. As noted above, the command will now conduct MC 02 this year. Equally encouraging, MC 02 is designed to assess the US military's ability to deal with the challenge of projecting power in an anti-access/area-denial environment in the 2007–10 time frame.

There is some concern, however, that MC 02 may not, in fact, be structured to address this mission. Consider:

- The opposing force depicted is one fielded by a high-end minor adversary in the latter half of this decade, such as might be encountered in a QDR small-scale contingency (SSC). If so, the challenge posed is even less imposing than that which could be mustered by a rogue state such as Iran, Iraq or North Korea, let alone the capabilities resident in a major regional power a decade from now.
- The MC 02 scenario posits the availability of in-theater sanctuaries—protected bases within the anti-access area—even though the field exercise is designed to evaluate US forces' proficiency in dealing with an anti-access challenge to forward bases. Furthermore, the military capabilities to be employed are only those that exist today in the US military or that are already part of the Services' programs. Put another way, the exercise will be conducted only with forces and systems that are already in the defense program. There is no place to evaluate promising new alternative field formations or systems with an eye toward adding them into the defense program if their surrogates performed well during the exercise. By restricting the capabilities available to the exercise commander only to those the Services have already decided to field, the military is limiting its ability to better prepare for future challenges.
- There does not exist, nor are there plans to create, the kind of Joint Opposing Force (JOPFOR) that proved so important in the US Navy and German Army field exercises of the interwar years, and more recently in venues such as the Army's National Training Center (NTC) and the Joint Readiness Training Center (JRTC). Absent such a force, field exercises come to resemble demonstrations rather than approximations of wartime operations.⁵⁷ But field demonstrations place a premium on successfully demonstrating the viability of existing capabilities as opposed to identifying new and more effective capabilities and operational concepts. The desire to avoid risk that is characteristic of pursuing demonstrations reduces the likelihood that the exercise will fail in the sense that some current forces, systems and

⁵⁷ As one senior commander at JFCOM stated to the author, "We don't do experiments. We do demonstrations of existing capabilities."

preferred methods of operation will be viewed in an unfavorable light. However, the real risk incurred here is that the military will fail to identify those systems, capabilities and operations that will—and will not—fare well in future conflicts.⁵⁸

Ironically, while MC 02 may be intended to address an emerging anti-access challenge, one can also argue that it will better assess how the Services might re-fight Operation Allied Force. Yugoslavia represented a high-end SSC, as is called for in MC 02. Italy offered the kind of key in-theater sanctuary base provided for in MC 02. The US military's operational concept in Allied Force was akin to the RDO being explored in MC 02 in the sense that, once it proved unable to arrest the Serbians' ethnic cleansing, NATO's bombing campaign sought to bring about a rapid capitulation by striking the key targets that underpinned the enemy's willingness to continue the fight. Finally, the Army's transformation vision of rapidly deploying a brigade-size force to an austere forward base calls to mind the deployment challenge confronted by Task Force Hawk during the Kosovo campaign.

The approach to joint field exercises reflected in MC 02 does not compare favorably with the approach pursued by military organizations that have pursued transformation aggressively. More realistic scenarios are needed that reflect future threats. Surrogate systems and formations should be incorporated into the exercise. A JOPFOR should be established and oriented on exploiting capabilities that are currently resident in other militaries, or likely to be in the near future. Failing to undertake this kind of approach will almost certainly compromise severely JFCOM's efforts to utilize joint field exercises as an important means for guiding transformation.

THE WARFIGHTING CINC AS PRIMARY CUSTOMER

MC 02 is being coordinated with the US Commander-in-Chief, Pacific (CINCPAC), and will be conducted in the western US training areas.⁵⁹ This is all to the good since, if history is any guide, the warfighting CINCs should be among JFCOM's principal customers. Some of the key challenges identified in a post-transformation regime, such as anti-access and area-denial threats, already exist in some form. For example, a near-term contingency involving conflict with North Korea would almost certainly find CINCPAC confronting a base-access challenge with respect to the major air bases and port facilities in South Korea. Similarly, in any near-term contingency involving conflict with Iran where US sea control of the Persian Gulf was required, the US Commander-in-Chief, Central Command (CINCCENT) would likely confront an area-denial threat along the littoral, and especially at the region's key choke point—the Strait of Hormuz.

⁵⁸ It should be noted that Millennium Challenge 2000 saw the participating Services conducting separate exercises under the same general scenario. Each Service also operated in different geographic areas. The Air Force, for example, operated partly out of Nellis Air Force Base in Nevada, while the Marines deployed to Fort Polk, Louisiana. Lowe, "In First, Services Run Their Battle Experiments Jointly," p.1.

⁵⁹ Shepherd, "Joint Concept Development and Experimentation Program". The training ranges JFCOM plans to utilize are Fort Irwin, California (Army); the Western Sea Range off the California coast (Navy); China Lake and Pt. Mugu, California (Navy); Camp Pendleton, Twenty-Nine Palms and George Airbase, California (Marines); and Nellis Air Force Base, Nevada (Air Force).

Joint field exercises should not be viewed as part of some abstract effort to fashion the US “military-after-next.” Rather, they should be seen as supporting current CINC training that is oriented on embryonic post-transformation challenges, which will ineluctably grow more formidable over time. For example, the training undertaken by CINCPAC at the operational level of warfare *today* should emphasize anti-access/area-denial contingencies (e.g., Korean Peninsula; China-Taiwan), as should CINCCENT (e.g., defense of Persian Gulf oil facilities and protection of seaborne commerce in the Gulf). Simply put, the CINCs should be JFCOM’s best customers when it comes to providing them with promising new operational concepts, system prototypes and training facilities, and in evaluating joint forces conducting transformation exercises against a standing JOPFOR. The US military should conduct at least one major joint transformation exercise a year (a substantial increase in the current, and even projected, exercise rate). Moreover, the regional CINCs should rotate joint forces through a Joint National Training Center (JNTC) for regular exercises and evaluations.

INFRASTRUCTURE

During the latter stages of the Cold War, the US military invested in a number of high-fidelity training facilities that greatly enhanced the value of its field training. For example, the Army’s NTC prepared brigade-size units for combined arms mechanized warfare against a Soviet-style adversary. Similarly, the Air Force and Navy put their pilots through Red Flag and Top Gun training, respectively.

Comparable facilities do not yet exist to support high-fidelity field exercises focused on the anti-access/area-denial threat discussed in this report. A JNTC is needed to enable both Service and Joint transformation field exercises. In 1997 the NDP recommended that this facility be established as part of its transformation strategy.⁶⁰ The recently completed QDR promises to “explore the need” for such a center.⁶¹

A principal barrier to creating a JNTC involves acquiring a sizeable expanse of land along the US littoral. Current efforts at training at the operational level find JFCOM and the Services attempting to link together various individual training centers (e.g., the western training ranges in MC 02) along with computer simulations. Even if such a tract of land could be made available, the US military would likely experience restrictions on its ability to radiate along the radio frequency spectrum, due to the potential for disrupting commercial electronic activity.

Several potential concerns arise from the absence of training facilities capable of supporting field exercises focused on preparing US forces for emerging challenges at the operational level of warfare. One is that it promotes emphasis on training at the tactical level of warfare. To be sure, such training is both necessary and desirable. But that training should be strongly informed by the warfighting concepts that are developed based on what is learned while training at the

⁶⁰ NDP, *Transforming Defense*, pp. 68–70.

⁶¹ *QDR Report*, p. 36.

operational level of warfare. Absent significant training at the operational level—especially in a period of transformation—there exists the danger that tactical-level training will suffer.

A second concern rests with the US military's ability to determine the feasibility of operational concepts in which information architectures play a major role. If the military is precluded from exercising its command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) architectures at the operational level of warfare, it may prove difficult to determine, with any great degree of confidence, the progress being made (or not made) in realizing such critical concepts as Network Centric Warfare (NCW), or in campaigns against threats that involve C4ISR efforts spread over large areas (e.g., extended-range strikes against critical mobile targets). Nevertheless, there is some cause for optimism. The CINCJFCOM's efforts to link the western training ranges together to support field exercises and experimentation may represent the first step toward creating a JNTC.

As for urban operations, current training centers, such as the JRTC at Fort Polk, Louisiana, offer facilities more characteristic of the terrain found in small towns. They possess neither the size encountered when operating in an urban environment, nor many of its unique terrain features (e.g., high-rise buildings, sewer and subway systems, etc.). A Joint Urban Warfare Training Center (JUWTC) should be created along the lines called for by the NDP.⁶² Such a center could also be employed to conduct high-fidelity exercises to prepare a wide range of government and non-government organizations to deal effectively with terrorist attacks on US urban centers, especially those involving the covert use of chemical, biological or radiological weapons.⁶³

It will be desirable to conduct transformation field exercises that address the growing challenge of maintaining space control or defending against an attack at the strategic level on the US national information infrastructure. Yet it is far from clear how this might be accomplished. There seems to be no comparable training infrastructure for these missions that might provide the kind of high-fidelity training for anti-access/area-denial and urban operations that could be available at a JNTC or JUWTC, respectively. Enabling these kinds of field exercises represents another major challenge for the US military's transformation effort.

⁶² NDP, *Transforming Defense*, pp. 68–70.

⁶³ Prior to the September 2001 terrorist attacks on the World Trade Center in New York City and the Pentagon in Washington, field exercises oriented on homeland defense were rather sporadic. One exercise, mandated by Congress, was conducted in May of 2000. Named “Topoff” (short for Top Officials), the exercise was conducted by the Federal Emergency Management Agency (FEMA) and the Department of Justice. The exercise involved a chemical attack in Portsmouth, New Hampshire, and a biological attack involving the simulated release of “anthrax spores” outside Denver, Colorado. The exercise was criticized by some, who argued that it overstated the threat facing America, since multiple terrorist attacks would be unlikely to occur within such a short time span. David A. Vise, “Drill Shows Cincinnati Unready for Terror,” *The Washington Post*, April 28, 2000, p. 2; Lisa Hoffman, “Drill Tests US Readiness Against Terror Attack,” *The Detroit News*, April 26, 2000, n.p.; and Patrick Connoles, “Catastrophic Drills Test US Readiness for Terror Attack,” *The Philadelphia Inquirer*, May 21, 2000, n.p.

RESOURCES (HUMAN AND MATERIAL)

Joint and Service field exercises oriented on military transformation currently suffer from a shortage of both human and material resources. To some extent, this is true with respect to the US military writ large, which suffers a significant program-funding mismatch.⁶⁴ However, if history is any guide, for Joint and Service field exercises to have a significant chance of playing their role in the US military's transformation, JFCOM will need:

- A standing JOPFOR;
- A budget that is at least an order of magnitude over what it is at present; and
- Major Funding Program (MFP) budget authority, similar to the one (MFP-11) enjoyed by the CINC, Special Operations Command.⁶⁵

As its name indicates, a JOPFOR should be drawn from all the Services. It should be given access to capabilities comparable to those currently in the inventories of likely or prospective competitor militaries. The JOPFOR should also employ capabilities (using surrogates, if necessary) that these militaries could plausibly be expected to deploy over the next decade. The JOPFOR's mission should be to field an anti-access/area-denial capability at the operational level of warfare, to include fielding force elements capable of performing both as regular and irregular forces in an urban environment. Just as the Army assigns some of its best soldiers to the NTC, and the Navy, early in World War II, sent its best carrier pilots from the Pacific back to the states to train newly commissioned pilots, the JOPFOR should be manned with highly capable warriors.

If CINCJFCOM, is to conduct joint field exercises at the operational level of war on a regular basis (i.e., at least once per year), and supplement these exercises with maneuvers and experiments at the tactical level of war, the CINC will need a major increase in funding. The Pentagon's budget for JFCOM's exercise and experimentation efforts was but \$30.5 million in fiscal year (FY) 1999, \$41.1 million the following year, and \$50.5 million in FY 2001. Such funding levels are at least an order of magnitude lower than what is required to conduct a vigorous, sustained level of field exercises at the operational level of war. For example, in 1999 *one* Service, the Air Force, spent more than \$60 million—substantially more than Joint Forces Command's *entire budget* for joint experimentation—on *one* exercise. According to JFCOM, funding shortages restricted the command to exploring only half the warfighting concepts it has identified.⁶⁶ In short, the JFCOM budget associated with field exercises and experimentation would have to be increased to some \$500–600 million per year.

⁶⁴ See Steven M. Kosiak, Andrew F. Krepinevich, and Michael G. Vickers, *A Strategy for a Long Peace* (Washington, DC: CSBA, 2001), pp. 9–12.

⁶⁵ The Defense Department's budget is broken down into Major Force Programs, or major categories. Among the MFPs are those for strategic forces (program one), general-purpose forces (program two), airlift and sealift forces (program four), and special operations forces (program eleven).

⁶⁶ McMichael, "Expeditionary Force," pp. 46–50.

As with the issue of creating a JNTC, the Bush Administration's QDR offers to "consider the establishment of a Joint Opposing Force and increasing the Joint Forces Command exercise budget."⁶⁷

If the JOPFOR is to be provided out of JFCOM's budget, significant additional funding will be required. In addition, CINCFJCOM should be given MFP budget authority and a substantial budget to insure promising capabilities that lie between the mission areas of the Services, or that fall victim to Service parochial interests, get fair evaluations.⁶⁸ This funding could be employed, in part, to support rapid prototyping of particularly promising capabilities, whether weapon systems, munitions or information systems.

Funding for the infrastructure initiatives and fielding a JOPFOR would run roughly \$7 billion over the next six years (i.e., over the next Future Years Defense Program, or FYDP)⁶⁹ Funding to support vigorous field exercises supported by the use of prototype and surrogate systems and capabilities would likely add another \$5 billion to the FYDP. Thus the average annual expenditure would be roughly \$2 billion a year, or less than one percent of the defense budget. The payoff in terms of improved military effectiveness and efficiency, through avoiding the procurement pitfalls noted above (e.g., false starts, dead ends), promise to more than justify the investment.

INPUT IN DEVELOPING FUTURE REQUIREMENTS

It almost goes without saying that the insights and lessons derived from field exercises must be harvested if innovation and transformation are to succeed. Focusing on post-transformation challenges and opportunities helps to ensure that the military is addressing the right questions with respect to future warfare, and thus can get the right answers with respect to emerging requirements. These answers mean little, however, unless they influence the way DoD's requirements are determined, budgets are shaped, resources are allocated, institutions are adapted, and forces are developed.

At present, however, even if one assumes a robust level of Service and Joint experimentation focused on emerging challenges, it is not clear how the insights derived from these efforts will be translated into new requirements. In recent years the Defense Department's Planning,

⁶⁷ *QDR Report*, p. 37.

⁶⁸ On a more modest level, General William Kernan, CINCFJCOM, is apparently trying to establish a fund—perhaps \$50 million per year—along these lines that would allow him to fund quickly promising breakthrough technologies that promote joint operations. "Joint Force CINC Proposes Special Fund for Breakthrough Technology," *Aerospace Daily*, July 18, 2001, n.p. This would enable General Kernan to exploit opportunities such as the Army and Navy's *Joint Venture*, a 313-foot catamaran that formerly functioned as a car and passenger ferry, but whose high-speed, shallow draft and long range make it particularly attractive as a potential troop transport, mobile command center and special operations platform. The use of *Joint Venture* as an operational prototype gives the two Services a surrogate platform for exploring a range of operational concepts designed to meet the QDR's critical operational challenge of operating in an anti-access/area-denial threat and defeating the threat. Nathan Hodge, "Navy Looks To Make A Warship Out Of A Ferry," *Defense Week*, January 14, 2002, p. 5.

⁶⁹ Kosiak, Krepinevich and Vickers, *A Strategy for a Long Peace*, p. 69.

Programming and Budgeting System (PPBS), as well as the JCS' Joint Requirements Oversight Council (JROC) have generally proven incapable of effecting significant changes in Service budget shares or program focus, despite the Defense Department leadership's declared determination to transform the US military.⁷⁰

Promising new capabilities or force elements (i.e., UCAVs; moving target indicator satellites such as Discoverer II; the arsenal ship; the Deep-Strike Brigade; the Streetfighter littoral operational concept; and Trident nuclear-powered, ballistic-missile submarine conversion to conventional missile carriers) have been terminated, delayed or find themselves in jeopardy. Yet support for programs, such as modernizing the tactical air forces and heavy divisions continues unabated, even though it is far from clear they would fare well against—let alone dominate—an anti-access/power-projection threat. In short, the existing process appears heavily weighted toward evolutionary, incremental improvements in existing military capabilities, as opposed to exploring aggressively those opportunities to develop a wider range of capabilities that might produce a major boost in military effectiveness.

⁷⁰ See M. Thomas Davis, *Managing Defense After the Cold War* (Washington, DC: CSBA, 1997).

V. CONCLUSION

If it is to meet emerging challenges in such a way as to preserve the current level of national security, the Defense Department will have to effect significant changes in its approach to military transformation. One key challenge is to increase dramatically the priority accorded to Joint and Service field exercises, to include a reorientation to address emerging challenges and opportunities stemming from the ongoing military revolution. At present, the Department's effort is unfocused and woefully underfunded. The potential gains from a properly directed and funded field exercise campaign are clear. One only has to look at how blitzkrieg upset the military balance in Europe and how the US Navy's fast carrier task forces turned the tide in the Pacific during World War II to see the payoff of successful military transformation. By extension, the importance of a well-designed program of field exercises that incorporate high-fidelity experimentation is also shown. The cost of such an initiative would run well under one percent of the US defense budget. The risks associated with continuing along the current path are clear as well. They include investing in false starts and dead ends, arriving at the right solutions to the wrong threats, and, ultimately, the prospect of paying a price measured in jeopardized security interests, national treasure, and the lives of young American service men and women.

GLOSSARY

AAAV	Advanced Amphibious Assault Vehicle
AEF	Aerospace Expeditionary Forces
ASW	anti-submarine warfare
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CINC	Commander-in-Chief
CINCCENT	Commander-in-Chief, Central Command
CINCPAC	Commander-in-Chief, Pacific Command
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FY	fiscal year
FYDP	Future Years Defense Program
GAO	Government Accounting Office
IBCT	Interim Brigade Combat Team
JCS	Joint Chiefs of Staff
JEFX	Joint Expeditionary Force Experiment
JFCOM	Joint Forces Command
JNTC	Joint National Training Center
JOPFOR	Joint Opposing Force
JROC	Joint Requirements Oversight Council
JRTC	Joint Readiness Training Center
JUWTC	Joint Urban Warfare Training Center
MC 02	Millennium Challenge 2002
MFP	Major Funding Program
NATO	North Atlantic Treaty Organization
NCW	Network Centric Warfare
NDP	National Defense Panel
NTC	National Training Center
PPBS	Planning, Programming, and Budgeting System
QDR	Quadrennial Defense Review
RDO	Rapid Decisive Operations
RMA	Revolution in Military Affairs
SSC	small-scale contingency
UAV	unmanned aerial vehicle
UCAV	unmanned air combat vehicle