Commanding general of Regional Command Southwest looks over village of Chineh in Helmand Province, near Combat Outpost Ouellette

U.S. Marine Corps (Jesse J. Johnson)

Thoughts on Force Design in an Era of Shrinking Defense Budgets

By DOUGLAS A. MACGREGOR

Force design is an essential tool in the hands of national political and military leaders to counter uncertainty in conflict or crisis. An agile force design can both create options and reduce risk should events take unexpected turns. No force design or national military strategy can address or eliminate all uncertainties, but an agile force design that provides national and allied political and military leaders with the means to comprehensively direct military power can dramatically reduce risk across the range of alternative future national security needs.

In recent remarks to the Corps of Cadets at West Point, former Secretary of Defense Robert Gates implied the need for fundamental change in force design when he insisted that "any future defense secretary who advises the President to again send a big American land army into Asia or into the Middle East or Africa should 'have his head examined,' as General [Douglas] MacArthur so delicately put it."[1] When Secretary Gates's remarks are viewed in the context of reduced Federal spending on defense, they reinforce the criticality of developing the right force design to ensure policymakers avoid shortsighted solutions that sacrifice critical current and

Colonel Douglas A. Macgregor, USA (Ret.), is the Executive Vice President at Burke-Macgregor Group, LLC.

future capabilities on the altar of near-term economy.

Put differently, today, the greater Middle East, Africa, and Southwest Asia are at the center of U.S. and allied security concerns. Tomorrow, far more serious military challenges to U.S. and allied security may emanate from Northeast Asia, Central Asia, and Latin America. In contrast to the recent past, these crises are likely to involve interstate conflicts for regional power and influence that overlap with the competition for energy, water, food, mineral resources, and the wealth these create.[2]

This article argues that American political and military leaders have an opportunity to expand the Nation's range of strategic options while reducing costs by finally breaking with the industrial age paradigm of warfare. The United States can do this by building a 21st-century scalable "Lego-like" force design, one structured and equipped for dispersed mobile warfare inside an integrated maneuver-strike-intelligence, surveillance, reconnaissance (ISR)-sustainment complex that combines the Nation's ground maneuver forces with strike, ISR, and sustainment capabilities from all of the Services. To construct this new force design, America's political and military leaders should take the following steps:

- recognize that current and future strategic environments require changes in U.S. and allied force development strategies
- devise a new operational concept for the Armed Forces appropriate to current and future strategic environments
- within the fiscal means available, reorganize existing U.S. forces into a more efficient and integrative force design under regional unified commands to execute the new operational concept
- use the resulting annualized savings—between $100 billion and $150 billion[3]—in manpower and resources both to pay down the national debt and to reorient our investment in military power to support the development of future military capabilities and new operational concepts.

The trendlines are unambiguous: military establishments that integrate functions and capabilities across Service lines, and, in the allied context, across national lines, while simultaneously eliminating unneeded overhead not only are less expensive to operate and maintain,[4] but they also are likely to be far more lethal. If adopted, the recommendations outlined in this article will create the foundation for an enduring American strategic military advantage at a point in time when the United States must economize on defense—saving hundreds of billions of dollars in the years ahead.

Understanding What Is Changing

At the heart of all national military strategy is the desire to increase the state's capacity for independent action. Independent people and organizations enjoy greater latitude for action at a time and place of their choosing. The same is true for the United States and its allies. However, to craft a force development strategy to achieve this goal, America's political and military leaders must understand what is changing in military affairs.

First, military power is no longer based on the mass mobilization of the manpower and resources of the entire state. Conscript armed forces, the norm in the 19th and 20th centuries, are gradually being replaced with professional military establishments inundated with technology.

Second, precision effects (kinetic and nonkinetic) using a vast array of strike

U.S. Air Force (Marc I. Lane)

Airmen prepare B–1B Lancer for mission in support of NATO operations over Libya

forces enabled by the rapid and timely dissemination of information through networked ISR capabilities point the way to a fundamental *paradigm shift* in the character of warfare. For example, a military contest on the model of Kursk in July 1943—a battle that involved nearly 940,000 attacking German forces and 1.5 million defending Soviet forces in a geographical area the size of England—would result in catastrophic losses for the defending side. Today, any ground combat force that immobilizes itself in prepared defenses on this World War II model would be identified, targeted, and annihilated from a distance.

Third, integrative command structures and new organizations for combat are essential features of this shift. Aircraft and ships involved in strike operations, both manned and unmanned, have excellent sensors that can be linked to other elements of the fighting force to support the translation of collected information into actionable intelligence. As a result, ISR and strike are mission areas that cut across all domains (land, sea, air, and space). In addition, ISR and strike capabilities now have the capacity to influence not only tactical strike and maneuver operations, but also the operational and strategic conduct of warfighting operations.

Fourth, the conditions shaping *dispersed mobile warfare* do not eliminate the close fight in ground combat operations whether these operations involve interstate or subnational conflicts. Nor do they eliminate uncertainty, surprise, or confusion from warfare. Regardless of how well new technologies are networked, they cannot provide perfect situational awareness or perfect information. Soldiers, Sailors, and Airmen will never know everything that happens inside their battlespace, and what they do learn will often be of fleeting value. Commanders must still think and act on short notice with incomplete information within the framework of a known operational intent.

Mines, rocket-propelled grenades, machineguns, mortars, chemical agents, barbed wire, and air defense systems are still effective against ground forces, even in this era of precision strikes. Mobile armored firepower inside the ground maneuver force will be more important than ever given the speed with which information must be assimilated, synthesized, and delivered in time to be exploited. A ground force that cannot take hits and keep fighting will collapse quickly. Networked information systems cannot replace killing power or organic survivability in the form of armored forces, especially in close combat. Ground maneuver forces (light, medium, or heavy) that cannot rapidly disperse to avoid presenting lucrative targets to the opposing force risk destruction.

Fifth, surprise in warfare is still attainable. Countermeasures in many forms including cyber warfare ensure the fog of war will persist. Many nation-states are acutely sensitive to these trends, and they are preparing to fight under these conditions in the future.[5] The more advanced scientific-industrial powers are building a large, diverse, and reliable range of conventional ballistic missiles for deep precision strikes designed to operate within terrestrial- and space-based sensor networks.[6]

Smaller powers with competent armed forces but less sophisticated technology are adapting to these changing conditions as well. For instance, the Yugoslav army adjusted with considerable success to cope with U.S. and Allied striking power during the Kosovo crisis. Thousands of small, mobile elements, skillfully concealed in rough terrain and aided by marginal weather conditions, were difficult to target from high altitudes. Overhead surveillance turned out to be more limited

U.S. Air Force (DeNoris Mickle)

10th Special Forces Group fast-rope from CV–22 Osprey during exercise Emerald Warrior 2011

Tomahawk cruise missile launches from USS *Barry* operating in Mediterranean Sea in support of Operation *Odyssey Dawn*

U.S. Navy (Jonathan Sunderman)

and more susceptible to deception than anticipated. In the absence of an attacking North Atlantic Treaty Organization ground force, the Yugoslav ground forces were never compelled to mass or concentrate.[7]

All of these points suggest an enormous strategic advantage will accrue to military establishments with an integrated military command structure and the right force design to orchestrate military capabilities across Service lines in the conduct of decisive operations. As the global experience in the private sector demonstrates, fewer but smarter people with intelligent technology can accomplish more than masses of troops with the brute force tools of the past.[8]

Defining a New Concept

Form defines warfare more than numbers or technology. The interaction of technology with organizational paradigms creates powerful new military capabilities. Embracing new technology is important, but it should not be done indiscriminately, out of fear of being left behind. Technology should be chosen for integration on the basis of what it can do today, as well as its potential for future development. It is therefore vital to establish the form that warfare will take, then, to determine the right joint operational concept and the appropriate force design to exploit technology.

Ubiquitous strike capabilities and the proliferation of weapons of mass destruction (WMD), nuclear or nonnuclear, now make the concentration of large land, naval, or air forces dangerous. As a result, dispersed mobile warfare—a condition that elevates tactical dispersion to the operational level of war—is replacing warfare on the World War II model of defined continuous fronts as the dominant form of combat. Moreover, in dispersed mobile warfare, integrated "all-arms" warfare is the overarching joint operational concept for warfighting operations.

All-arms operations integrate the functional capabilities of maneuver, strike, ISR, and sustainment across Service lines inside a seamless unified command and control (C^2) operational framework. In fact, success in contemporary and future warfare on land, at sea, or in the air demands the ability to maneuver from a dispersed configuration, concentrating effects and, for brief periods, ground combat forces at decisive points in time and space when conditions demand it.

Clearly, the most favorable conditions on land exist when ground forces operate within the framework of an integrated network of maneuver-strike-ISR-sustainment functions, hereafter referred to as the *complex*. Within the complex, attacking ground forces compel opposing enemy

forces to mass in response or else risk defeat in detail.

To effectively and economically defend U.S. and allied interests in the 21st century, forces should be organized to operate inside this complex to ensure responsive and accelerated decision cycles at all levels. Precision strikes from the air and sea can incapacitate enemy command and control, but the confusion and paralysis thus engendered are always temporary. Without the experience of warfare, people (including those in uniform) forget that the enemy is a reactive system.

Future adversaries, regardless of national identity, will work hard and rapidly to restore communication connections. They will also seek other ways to communicate that are less vulnerable to strikes and discover ways to preserve operational coherence without being detected. Over time, future nation-state and nonstate opponents should be expected to recover from the initial disruption that strikes cause.

It is essential, then, to destroy the opponent before recovery, which is why ground combat forces with tactical mobility, devastating firepower, and effective armored protection must be tightly integrated within the complex. Achieving this outcome requires the establishment of an integrated military command structure designed to employ dispersed and distributed combat elements as capability-based forces from all of the Services inside the complex.

Reorganizing Forces

Because the simplest tasks in war are difficult, complex command arrangements involving fragmented authority must be avoided. How information is used during conflict or crisis reflects the structures of the information flow, as well as the thinking and mentality of the people who use the information. The two influence one another and are inextricably intertwined.

World War II battles in which the Soviet Union was involved were generally decided in favor of the Soviet Union in part because its leadership organized and employed its armed forces under a unified military command structure that compelled integration of core service capabilities under a single operational commander. But the Soviet leadership was able to maximize combat power (land, sea, and air) where it was needed and economize where it was not needed. The branches of the Soviet armed forces were thoroughly subordinated to the *Stavka* (General Headquarters) and its subordinate command echelons—front and army—ensuring uncontested unity of action on the strategic and operational levels of war.[9]

It is also fair to characterize the Soviet command and control structure that triumphed in World War II as a highly centralized, top-down, ground force–dominated, attrition-based, mechanized/industrial one that squandered human life and resources on a scale beyond Western comprehension. However, regardless of the profound cultural differences that separated the United States and Europe from the Soviet Union, these are virtuous military outcomes worthy of emulation by U.S. and allied forces.

without the experience of warfare, people forget that the enemy is a reactive system

In the West, neither the Germans nor Western Allies created similar arrangements. For the Americans and British, Sir Winston Churchill's complaint that the "chiefs of staff system leads to weak or faltering decisions—or rather indecision"[10] went unheeded. In the United States, the Service chiefs together with policymakers in Washington set out to institutionalize the way that the United States fought World War II in the 1947 National Security Act. Subsequent legislative attempts to reduce the excessive bureaucratic power of the separate Services to fund and equip themselves independently, as well as the influence of single-Service warfare doctrine and organizations, have been limited in terms of how operations are conducted, as well as in terms of staggering American defense costs.[11]

The point is unambiguous. For reasons of cost, as well as survivability and lethality, less overhead and more combat power at the lowest level are organizing imperatives in 21st-century dispersed mobile warfare. Part of the solution is to implement a new integrated operational military command structure designed to conduct U.S. and American-led allied operations at home and abroad.

Establishing the Construct

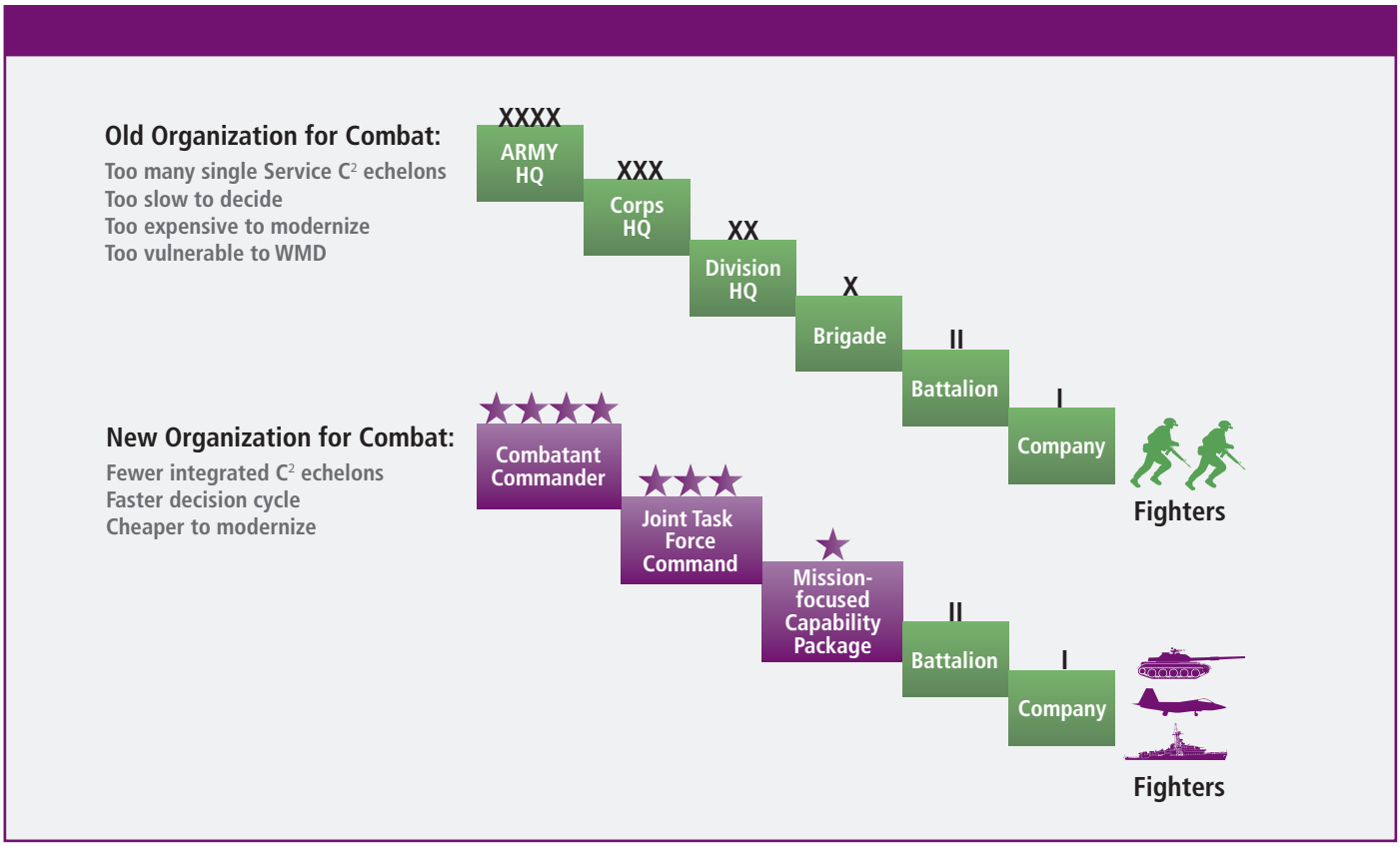
In the United States, Armed Forces operational decisionmaking in other-than-ground-maneuver headquarters was generally focused on supporting operations, not on determining their course.[12] Today, this Army-centric approach with its roots in World War II is no longer relevant. The degree of capability integration required in dispersed mobile warfare cannot be achieved inside restrictive, hierarchical, single-Service Cold War command systems suffering from information overload and too many levels of command.

On land, simply breaking existing corps and divisional structures into smaller pieces will not change the industrial age warfighting paradigm, reduce or eliminate echelons of unneeded C^2, or advance integrative, seamless jointness on the operational level. Geographically dispersed land-, air-, and sea-based forces require a high level of command coherence through technologically and intellectually shared battlespace awareness. This condition dictates the requirement for integrative command structures on the operational level that magnify the larger fighting power of the integrated joint force.

The proliferation of WMD and related strike weapons now compels the transfer and integration of capabilities once found only at the Army division and Marine Corps/Marine Expeditionary Force (MEF) levels, or only in the naval and air forces down to lower command echelons (see figure). These new command echelons must also be tightly integrated with the war-winning ISR and strike capabilities found in all of the Services. In this sense, ISR must be viewed as the key integrating function for warfighting and operational design, planning, and execution.

U.S. forces are in a position to integrate current Marine Corps/MEF and division C^2 into a joint C^2 structure such as the notional joint task force (JTF) command. This operational-level headquarters is designed to orchestrate the effects that will compel the internal collapse of an opponent through maneuver and strike without reliance on destructive time- and resource-consuming attrition warfare or mass armies.

Combining strike and maneuver into a single joint operation inside a JTF command is the core of operational art. Striking the enemy throughout the entire depth of operational deployment simultaneously and, at the same time, introducing rapid, mobile, mutually supporting air and ground forces through the disrupted force to fight a series of actions for which the enemy is not prepared is the essence of this form of warfare. These



conditions are no less applicable to the defeat of loosely organized guerrilla forces operating in complex or urban terrain.[13] The mission to implement this operational concept in the information age falls to the lieutenant general or vice admiral in JTF command headquarters.

Battlefields have been emptying for the last 50 years in response to new and more lethal weapons technologies. Supporting these dispersed forces will not be easy. For these reasons, a two-star flag officer focused exclusively on sustainment functions is a deputy commander for sustainment inside the JTF command structure.

With the expansion of strike and information assets, it is critical to supply the JTF commander with deputies and staffs committed to employ the full complement of ground, air, electronic, and information operations capabilities. The emergence of a deputy commander for ISR marks a shift from the World War II/Cold War mindset that treats ISR as a supporting function to a new understanding that, in the 21st century, ISR integrated with strike and maneuver operations can be both operationally and strategically decisive.[14]

One major general within the JTF leads the close combat forces deployed to the conflict area. The deputy commander for maneuver directs the operations of the ground maneuver elements in ways similar to what division or MEF commanders do today. He brings an appreciation of the critical role that positional advantage plays in the calculus of war to the planning and execution of operations.

battlefields have been emptying for the last 50 years in response to new and more lethal weapons technologies

Another major general or rear admiral (upper half) commands strike operations. With the emergence of U.S. and allied strike complexes inside the regional unified commands, the links from deputy commander for strike to ground combat formations, as well as to the strike assets in all the Services, are pivotal.[15] With his links to strike coordination officers in every ground maneuver force and across the Services, he is simultaneously the critical connection to air and naval strike capabilities. The evolution from deployable teams to liaison officers to permanent party experts was a key element in increasing the effectiveness of space capabilities as geographic theater commanders gained more influence over space requirements and integration.[16] Strike capabilities should be employed by similar officers with specialized expertise. In this capacity, the deputy commander for strike can exploit capabilities residing in all Service strike and maneuver forces to support maneuver and suppress or defeat enemy air defenses as well as enemy missile attacks.

In addition to these JTF "force employment" headquarters, two sets of future resource pooling or management headquarters could be formed to provide capabilities across the various theaters of operations to the combatant commanders, as well as to the JTF commands. These functionally based commands would include:

- Theater Strike and Missile Defense Command
- Theater ISR Command
- Theater Maneuver Command
- Theater Sustainment Command.

Two sets of these resource management headquarters would be capable of managing the force and asset management tasks on a global basis.

These JTF commands would exist in sufficient quantity to command and employ U.S. and allied forces on land, at sea, or in the air. All forces would be designed as mission capability packages organized for employment under one-star commanders. American air and naval forces routinely assemble forces organized around ISR, strike, sustainment, and maneuver tailored to specific missions. Sometimes these are composite wings or surface action groups. However, ground forces have only recently begun to think in terms of mission-focused capability packages. Movement toward harmonization—and away from Cold War notions of C^2 synchronization—has been critical to this outcome. Increasingly, the sort of intelligence that Soldiers and Marines need is fleeting, and traditional Army and Marine command structures that cannot jump on this intelligence and exploit it have been compelled to change thinking and behavior.[17]

What emerges from the experience of the last 9 years is the growing recognition inside the Army (and, more recently, inside the Marines with the standup of a large, independent Marine brigade battle group in Afghanistan) that a new self-contained combat formation is needed[18]—one smaller than a division, but larger than a standard brigade, a formation capable of limited independent action that eliminates unnecessary command levels and drives jointness to a much lower level.[19]

in land warfare, the next logical step in force design is a 5,000- to 6,000-man formation called a Combat Maneuver Group

All of these points suggest that in land warfare, the next logical step in force design is a 5,000- to 6,000-man formation called a Combat Maneuver Group (CMG). The CMG combines the command element, fighting power, and support element into a stand-alone, mission-focused capability package. The CMG is commanded by a brigadier general with a robust staff, including a deputy commander and a chief of staff, both of whom are colonels.

The CMG drives the joint command, control, communications, computers, intelligence, surveillance, and reconnaissance (C^4ISR) plugs to lower levels, compressing the tactical and operational levels to the point where maneuver and strike are integrated at a much lower level than is currently possible. Maneuver, strike, ISR and sustainment formations become clusters of joint combat power that have the capacity for operations on land reminiscent of the way ships operate at sea. Translated into terms that Soldiers and Marines understand, the new force design must offer the following features:

- ready on call, quickly deployable, and employable by joint force commanders
- adaptable for a range of operations
- easily integrated and networked within the joint force

MQ–1 Predator provides airborne reconnaissance, surveillance, and target acquisition for coalition forces in Iraq

U.S. Air Force (Brian Ferguson)

- supportable despite distance and dispersion
- survivable against any adversary
- trained with the other Service components so that they are capable of "integrated joint warfighting" on short notice.

In the new C^2 organization modeled on the JTF command structure, there is a Strike Coordinator. These coordinators supplant existing fire support officers in the ground forces and become specialists in all the Services with joint training to qualify them to direct strike operations on behalf of ground combat groups or similar mission-focused capability packages from the air and sea. They are designed to be an extension of the strike structure into every land, naval, or air formation.[20]

The end result of this process is a module of combat power that can deploy in smaller configurations below 5,000 to 6,000—of 2,500, 1,100, and 500—or with augmentation from allies or other combat groups for small-scale operations. They can also deploy with other modules (ISR, strike, sustainment) for larger contingencies. However, they do not require augmentation from higher echelons to be joint interoperable. With joint C^4ISR, these formations become building blocks that are federated to create larger forces as required.

Transforming all Service forces into mission-focused force packages that can be assembled into larger joint operational forces is essential if maneuver, strike, ISR, and sustainment capabilities are to be effectively integrated to pose more complex threats to new enemies. In practice, this scheme for military power depends on evolving integrated, joint systems and a technical architecture (a set of building codes) for successful aggregation.

There are many benefits to this approach. Eliminating some of the career gates on the Service ladder changes career patterns, allowing more time for lieutenant colonels and colonels (as well as naval equivalent ranks) to become educated and qualified for joint operations—something current Service career patterns obstruct. Reorganizing ground maneuver forces into 5,000- to 6,000-man combat formations under brigadier generals provides a larger, ready, deployable, joint combat force of Soldiers.

Another benefit is the appointment of a brigadier general to command on the tactical level. Here, the historical record is illuminating. Accompanying the first infantrymen ashore on June 6, 1944, was Brigadier General Theodore Roosevelt, the only American general officer who arrived with the first wave of troops on D-Day. When Roosevelt realized that the initial assault force had landed 2,000 yards south of where they should have on Utah Beach, Roosevelt adjusted the plan, telling the company commanders precisely where they were and directed their movement inland along new routes. The result was rapid penetration, in a few hours, by American infantry several miles inland that Army intelligence analysts predicted would take several days.

On Omaha Beach, where there was no general officer present, the situation was far more confused and more costly in terms of American dead. The proposed model for Force Employment within the New Operational Concept will similarly improve the effectiveness of American tactical operations and their efficient integration into operations designed to support national strategic objectives.

Reorienting Modernization

The compression of reduced C^2 overhead while combining existing single-Service echelons into a flatter, multi-Service integrative C^2 structure will definitely contribute to long-term cost savings. The point is to reduce the bloated C^2 overhead, a legacy of the Cold War, while maximizing ready and deployable combat power. Combining the implementation of the integrative command resource management structures inside the regional maneuver-strike-ISR-sustainment complexes with the compression of today's six regional unified commands (U.S. European, Central, Pacific, Southern, Northern, and Africa Commands) into four (potentially U.S. Pacific, Atlantic, Northern, and Southern Commands) would accomplish both objectives: increasing capability while achieving annualized savings in current defense spending of at least $100 billion.

Implementing the Navy's rotational readiness model across American (and potentially allied) forces would also result in additional efficiencies, while simultaneously improving unity of effort and rationalizing the training, modernization, deployment, and reconstitution of U.S. and allied forces. Rotating U.S. forces through four readiness training, deployment, recovery, and reconstitution phases of 6 to 9 months each guarantees a larger portion of the current U.S. joint force is ready to fight on short notice than is the case today. The importance of making routine deployments more predictable, ensuring regular periods of rest for American troops, cannot be overstated.

The cost savings involved in reducing unneeded wear and tear on equipment and people should now be self-evident, but these savings do not entirely address the probable savings in manpower and equipment. For instance, sea control is no longer a mission that demands a large surface fleet on the World War II model. America's nuclear submarine fleet augmented with fewer surface combatants employing long-range sensors, manned and unmanned aircraft, communications, and missiles can dominate the world's oceans, ensuring the United States and its allies control access to the maritime domain that supports 91 percent of the world's commerce.

Annualized savings resulting from change associated with the maneuver-strike-ISR-sustainment complexes in the various regional unified commands would also run into the tens of billions of dollars as combatant commanders and Service chiefs restructure the conduct of overseas presence missions and determine those overseas facilities they no longer deem operationally useful. The method used to identify and capture these savings is a detailed blueprint for change in a Force Design Roadmap. For every capability gap identified, selected equipment sets and supporting jobs will be identified for elimination to liberate resources for investment to close those gaps.

Closing Thoughts

To leverage uncertainty and judiciously select from the warfighting concepts and technologies of the present to field new innovative organizations and capabilities for the future within the fiscal constraints imposed by economic stringency, the United States should chart a new course into the future. As implied at the beginning of this article, change in military affairs is inevitable. Bill Gates stated it best, warning that when waves of change appear, "You can duck under the wave, stand fast against the wave or, better yet, surf the wave." Put another way, the faster you can accurately assess a situation, make "good enough" decisions on what to do about it, and act decisively to deal with it, the more competitive you become.[21]

The time has come to begin reorganizing the manpower and capabilities inside the Nation's Armed Forces within an integrated, joint operational framework to provide a larger pool of ready, deployable fighting forces on rotational readiness. Building maneuver-strike-ISR-sustainment complexes inside the regional unified commands is a way to create the foundation for enduring American military power on a global level at a time when the Nation's public debt—if honestly calculated to include $7 trillion of additional deficit spending through 2015—will approach $18 trillion.[22]

the future points toward smaller, more lethal force packages designed for missions of limited duration and scope

Enduring strategic power is vital in a world where the proliferation of WMD makes future operations from large, expensive fixed installations like those in Iraq and Afghanistan extremely dangerous. Instead, land, naval, and air forces must mobilize organic combat power that is disproportionate to their size and numbers inside an integrated framework. The future points toward smaller but more lethal force packages designed for missions of limited duration and scope, not mass armies created for territorial conquest and occupation. In this sense, the implementation of integrated all-arms operations within the maneuver-strike-sustainment complex outlined here not only promises to save money in national defense, but also provides the basis for a coherent, unified view of warfare that is missing from today's Armed Forces. **JFQ**

NOTES

[1] Quoted by Colin Clark, "The Gates Doctrine: Avoid Big Land Wars," DoDBuzz.com, February 27, 2011.

[2] Miriam Elder, "President Dmitry Medvedev said that Russia should unilaterally claim part of the Arctic, stepping up the race for the disputed energy-rich region," Reuters, September 17, 2008.

[3] "Debt, Deficits and Defense: A Way Forward," Report of the Sustainable Defense Task Force, June 11, 2010, 16.

[4] Scott Gebicke and Samuel Magid, *Lessons from Around the World: Benchmarking Performance in Defense*, McKinsey on Government (Pittsburgh: McKinsey & Company, Spring 2010), 12–13.

[5] John Depres, Lilita Dzirkals, and Barton Whaley, "The Timely Lessons of History: The Manchurian Model for Soviet Strategy," Report Prepared for the Assistant Secretary of Defense and Director of the Office of Net Assessment, R–1825–NA (Santa Monica, CA: RAND, July 1976). Translated Soviet after action reviews identify tracked armored fighting vehicles as the only equipment capable of operating and surviving in Manchuria's diverse desert, mountain, swamp, and forested terrain. The Soviets point to tanks as having been the decisive weapon platform in all of Manchuria.

[6] For instance, the Chinese counter U.S. military strength in "asymmetric" ways. Instead of trying to match U.S. Air Force deep strike capabilities, they are building a large, diverse, and reliable range of conventional ballistic missiles for deep precision strike. Instead of trying to match the U.S. ability to develop and operate advanced aircraft, they are investing in technologies or entire aircraft and adapt them to their own needs, and complement them with similarly obtained advanced surface-to-air missiles. Instead of trying to match U.S. Navy aircraft carriers, they are building long-range conventionally armed ballistic missile systems designed to attack those carriers and are deploying a network of sensor systems to target them.

[7] Benjamin S. Lambeth, *NATO's Air War for Kosovo: A Strategic and Operational Assessment* (Santa Monica, CA: RAND Project Air Force, 2001), 242–248.

[8] Alvin Toffler and Heidi Toffler, *War and Anti-War: Survival at the Dawn of the Twenty-first Century* (Boston: Little Brown, 1993), 77.

[9] Michael Deane, Ilana Kass, and Andrew Porth, "The Soviet Command Structure in Force Design," *Strategic Review* (Spring 1984), 64–65. Notice, however, that fronts (equivalent in size to American armies) were also fully joint commands. When the Soviet Union's 40th Army deployed to Afghanistan in 1979, it did so as part of a joint task force (JTF) structure that was fully joint. On the other hand, jointness stopped at the JTF level, which caused serious problems on the tactical level.

[10] Sir Winston Churchill, quoted by Steven F. Hayward, *Churchill on Leadership* (Rocklin, CA: Prima Publishing Forum, 1997), 40.

[11] Nathan Hodge, "Pentagon Looks to Save $100 Billion Over Five Years," *The Wall Street Journal*, June 3, 2010, A11.

[12] For instance, during Operation *Desert Storm*, divisions had organic military intelligence (Combat Electronic Warfare Intelligence) battalions and signal battalions, while Third Army had a military intelligence brigade and a signal brigade. An example of a parallel external headquarters is U.S. Air Forces Central (CENTAF), the Air Force component of U.S. Central Command (USCENTCOM) during Operation *Desert Storm*. CENTAF was responsible for integrating the offensive air function throughout USCENTCOM headquarters.

[13] Nancy A. Youssef, "Pentagon Rethinking Value of Major Counterinsurgencies," *McClatchy Newspapers*, May 13, 2010.

[14] David A. Deptula and R. Greg Brown, "A House Divided: The Indivisibility of Intelligence, Surveillance, and Reconnaissance," *Air Power Journal* (December 2008), 21.

[15] Richard Hart Sinnreich, "Air-Ground Integration Requires More Than Patchwork," *Lawton* (OK) *Constitution*, October 6, 2002, 1.

[16] Keth W. Balts, "Intell, Satellites + Remotely Piloted Aircraft," *Air and Space Power Journal* (Fall 2010), 19. Balts writes, "While this evolution occurred at the junior-officer level, a similar one occurred at the senior level, although it lagged the junior-level process by several years. Senior space officers served as liaison officers, deployed, and then eventually became permanent members of theater headquarters as *directors of space forces*, positions created to facilitate coordination, integration, and staffing activities in support of space-integration efforts for the combined force air component commander."

[17] "Deptula: ISR Surge Will Overwhelm Military's Ability to Process Intel," *Inside the Air Force*, October 23, 2009, 5.

[18] Jason Sherman, "Army Plans 'Comprehensive' Review of How to Modify Brigade Design," Inside Defense.com, October 26, 2010.

[19] Richard E. Simpkin, *Race to the Swift: Thoughts on Twenty-first Century Warfare*, (London: Brassey's, 1985), 290.

[20] Clearly, the Air Force will need to be convinced that these new strike coordinators know how aircraft, manned or unmanned, fly, how they fight, how they are at risk if misused, what aircraft can and cannot do, and how to use them with minimal fratricide/collateral damage risk. In addition, the Army will need to be convinced that the strike coordinator knows artillery, rockets, mortars, and unmanned combat aerial vehicles, what they can and cannot do, what tools are available, and how to use them with minimal fratricide/collateral damage risk.

[21] Robert L. Cantrell, *Outpacing the Competition: Patent-based Business Strategy* (New York: John Wiley & Sons, 2009), 260–261.

[22] David Stockman, "Four Deformations of the Apocalypse," *The Wall Street Journal*, July 31, 2010.