

JFQ

Center of Gravity

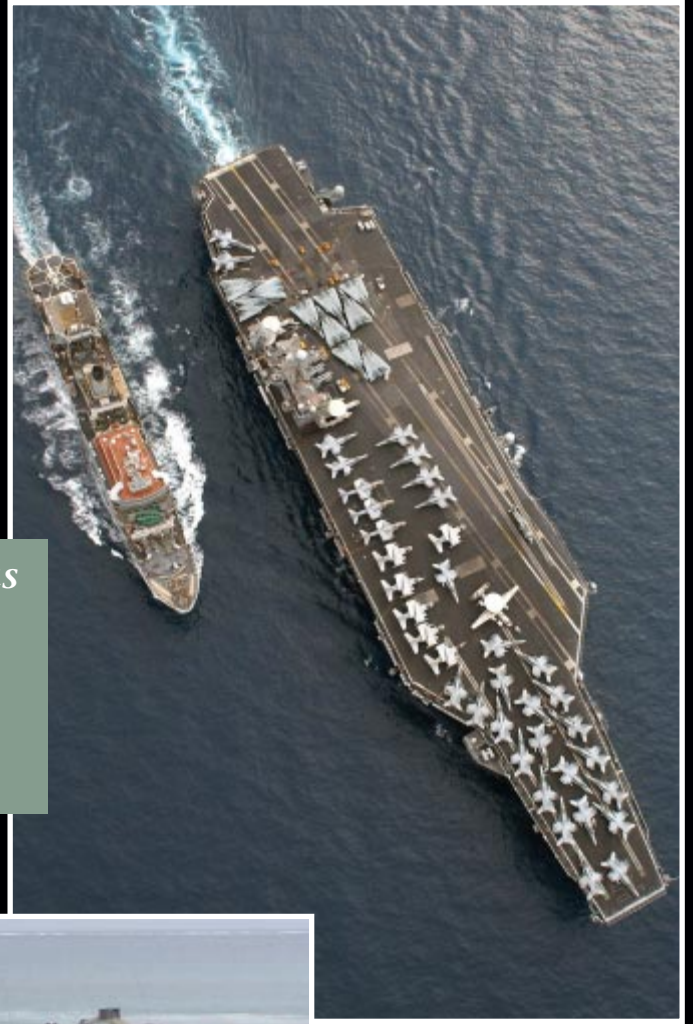
Homeland Security

Consequence Management

Command and Control

Effects-Based Operations

35
Issue



Signal Corps officers like to remind us that “although Congress can make a general, it takes communications to make him a commander.”

—Omar N. Bradley







coming next . . .

the future of Reserve Forces

plus

**psychological operations,
component commands,
asymmetric warfare,**

and more in issue thirty-six of JFQ



JFQ

J O I N T F O R C E Q U A R T E R L Y

Published for the
Chairman of the Joint Chiefs of Staff
by the Institute for National Strategic Studies
National Defense University
Washington, D.C.



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The cover shows marines firing 155mm howitzer, Iraqi Freedom (U.S. Marine Corps/Andreas A. Plaza). The front inside cover features soldiers in Bradley fighting vehicle, Iraqi Freedom (982^d Combat Camera/Lee Davis); USNS Spica alongside USS Harry S. Truman, Enduring Freedom (Navy Visual News Service/John L. Beeman); Marine amphibious vehicles on Splash Beach, Okinawa (1st Marine Air Wing/Tony Vega); and F-16s over Mediterranean (U.S. Air Force/Mark Bucher). The table of contents depicts accident response exercise (20th Communications Squadron/Josef Cole). The back inside captures C-17 dispersing

countermeasure flares (U.S. Air Force). The back cover highlights activities of the Reserve Forces: rehearsing crowd control (Fort McCoy/Lou Ann Mittelstaedt); refueling F-15s (83^d Fighter Squadron/Michael Ammons); conducting weapons training (Fleet Combat Camera Group, Pacific/Brandon A. Teeples); and flying to live fire exercise (16th Special Operation Wing/Greg L. Davis).



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Joint Force Quarterly

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JFQ is published for the Chairman of the Joint Chiefs of Staff by the Institute for National Strategic Studies, National Defense University, to promote understanding of the integrated employment of land, sea, air, space, and special operations forces. The journal focuses on joint doctrine, coalition warfare, contingency planning, combat operations conducted by the unified commands, and joint force development.

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ISSN 1070-0692

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This publication has been approved by the Secretary of Defense. All previous issues have been published electronically and are available over the Internet at the address indicated below. Paid subscriptions to *JFQ* are offered through the U.S. Government Printing Office.

The editors invite articles and other contributions on joint warfighting, interservice issues that support jointness, and

topics of common interest to the Armed Forces (see page 148 for details). Please direct all editorial communications to:

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http://www.dtic.mil/doctrine/jel/jfq_pubs/index.htm

Published in October 2004

A Word from the



Paratroopers boarding C-130 in Iraq.

U.S. Air Force (Suzanne M. Jenkins)

Chairman

One of my three agenda items as Chairman is military transformation, an imperative that is obviously gaining acceptance across the defense community. It is difficult to find an argument for standing still rather than developing new capabilities. Yet there are many unresolved issues because clarity on the future environment is lacking.

Despite such uncertainties, there are many capabilities that must be transformed in order to get to the fight more quickly, achieve better information sharing and command and control, increase interoperability, and improve interagency coordination. And while progress on transformation in the 1990s was not insignificant, 9/11

raised the stakes. Terrorists, who want to undermine the very principles on which America is founded, threaten our security at home and abroad.

The Armed Forces have many advantages over potential enemies: command and control, logistics, precision weaponry, and professionalism. But terrorists pose an unconventional threat that is highly adaptable and shrewd. For example, while many al Qaeda leaders have been killed or captured, their command and control network has adjusted. It is necessary to transform in order to be more agile, responsive, and capable to defeat global terrorism.

(continued on page 4)

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(continued from page 1)

Experimentation

Transformation has three aspects: technological, intellectual, and cultural. New technology and weapons systems are important, but old problems also must be approached in new ways—the intellectual piece. And the ways in which organizations interact—components, services, agencies, and allies—must change. That is the cultural aspect, which is probably the greatest challenge.

There are real benefits in understanding resistance to change. As part of the CJCS lecture series, I recently invited Hugh O'Neill of the University of North Carolina to address the subject of transformation. He has written and lectured widely to business and government audiences on the dynamics that make organizations resistant to change. The key influences that work against change are size, age, and success. Although these

**what defines experimentation
is applying scientific method to
evaluate a concept**

factors strike close to home for many of us in uniform, O'Neill identified some methods to overcome them. He recommended encouraging innovation and risk-taking by breaking out smaller groups that can function separately from the day-to-day tasks of the organization. These groups would go outside normal processes to come up with innovative ideas. There is a growing community hard at work doing just that. We call them experimenters.

Experimenting is not new, especially in wartime. During the Civil War, the Navy built and employed *USS Monitor*, a ship that was really a floating set of experiments; it had ironclad armor, an innovative hull design, and a moveable gun turret. Aviation was in its infancy in World War I when the Army Air Corps experimented with observation, aerial gunnery, and bombing. In the Korean War, the Army experimented with combat medical care, aeromedical evacuation by helicopter, and MASH field hospitals, all of which dramatically reduced combat casualties.

What defines experimentation—whether it takes place in isolation or as part of an exercise, wargame, or demonstration—is applying scientific method to evaluate a concept. Experiments test ideas by hypothesizing, testing the hypothesis, collecting data, and analyzing results to determine their validity. By contrast, traditional exercises provide training for commanders, staffs, and units to practice existing doctrine and capabilities.



U.S. Army (Charles B. Johnson)

Patrolling in Al Fallujah,
Iraqi Freedom.

The real key to experimentation is risk-taking. Although the acquisition process attempts to mitigate risk by a structured approach and rigorous accountability, experimenters accept a certain degree of risk. Outcomes are not predetermined; failure is an option. That amounts to a cultural change for most. For example, in a recent experiment, an off-the-shelf networking program was used to link planners. It did not work, so U.S. Joint Forces Command (JFCOM), working with the Defense Information Systems Agency, went back to the drawing board to find a better tool.

Even as a formal process to support transformation, experimentation has been taking place throughout the Department of Defense for some time. The services have been making progress for about a decade, and their battle labs have been experimenting and developing concepts for years.

The Marine Corps Warfighting Lab, established in 1995, has developed and fielded a range of projects. For example, it designed and tested the chemical and biological incident response

force, which became operational at Camp Lejeune. The Army, Navy, and Air Force have 27 labs in all, but until recently no one was responsible for coordinating them. Today the joint community is making great strides in linking experiments to lessons learned and required joint capabilities as well as coordinating experiments among the services and combatant commands.

Steering the Course

Last year, JFCOM assumed the lead role in military transformation. One of its functions is issuing the joint concept development and experimentation campaign plan, which lays out criteria and priorities for all joint experiments. The command coordinates experiments with all services, combatant commands, and other Government agencies such as the Federal Bureau of Investigation, Central Intelligence Agency, and Justice Department, as well as allied nations.

One task that JFCOM must tackle, along with other players, is balancing readiness against mid- and long-term transformation. Professor O'Neill suggested ways to have highly independent groups begin transformation experiments,



U.S. Navy (Todd Flint)

USS Theodore Roosevelt, Enduring Freedom.

increase efforts within existing organizations focusing on mid-term modernization, and encourage critical thinking to come up with innovative solutions for the long term. The JFCOM vision of experimentation is strikingly similar, encouraging efforts along two separate paths. The first is aimed at the near term—fielding prototypes quickly to solve existing problems. The second is aimed at developing innovative concepts and capabilities for the future. Both are critical. In fighting the global war on terrorism we must transform in midstride, balancing short-term needs with longer-range vision to ensure that we are as prepared as possible to meet future threats.

The Olympic event of experimentation to date was Millennium Challenge in summer 2002, which involved more than 13,500 people and an

enormous simulation network. The experiments covered everything from headquarters command and control to individual weapon systems. One concept tested was standing joint force headquarters (SJFHQ), conceived as a means to provide the combatant commander with a core command and control team, along with collaborative networking capabilities, for joint task force headquarters. The goal is eliminating the spin-up time for ad hoc, service-centric headquarters to respond to contingencies as combined and joint headquarters.

Initially, XVIII Airborne Corps had the lead for the SJFHQ experiment, but it could not participate in Millennium Challenge because it was deployed to Afghanistan; III Corps responded in just three weeks. This late change in the game plan actually proved beneficial. Despite short notice, III Corps validated the headquarters concept by becoming operational in only five days.

Information sharing was another focus of Millennium Challenge. At one point, 800 people were networked in a collaborative information environment that furnished situation awareness on opposing forces, Web portal to access databases, and a collaborative tool. The prototype system that resulted is about to be fielded in Korea, the Pacific region, and various non-DOD agencies.

The air component conducted several experiments within Millennium Challenge, including a program for generating air tasking orders and an improved process for time-sensitive targeting. These capabilities were employed in Iraqi Freedom, with over 800 time-sensitive targets struck.

Experiments went beyond headquarters information systems and strategic and operational processes to tactical aspects of joint warfighting. For example, the Army Stryker Brigade proved its intratheater ability to deploy, flying aboard C-130s to the National Training Center. The brigade is now serving in Iraq. In another example, the Marine Corps experimented with Dragon Eye—a five-pound, \$70,000 UAV designed to provide surveillance and reconnaissance out to six miles. This vehicle was also employed during Iraqi Freedom.

Enhanced Jointness

The experimentation community is functioning in high gear. The JFCOM charter ensures that it will not lose sight of its primary objective: enhanced joint warfighting. As Chairman, I have stressed the need to look beyond the Armed Forces in planning and executing operations to bring every instrument of national power to bear in a coherent way. Experimentation is fertile ground for exercising interagency processes.



U.S. Marine Corps (Kevin R. Reed)

Marines crossing river in Iraq.

Millennium Challenge investigated a concept known as the joint interagency coordination group that provides civilian perspectives and contacts to joint task forces. It is being expanded from an initial focus on counterterrorism to the range of military operations. The day may not be too far off when we will include the private sector in the integration process.

Multinational cooperation is important in fighting the global war on terrorism, and JFCOM experimentation is breaking new ground by testing allied participation in collaborative networks.

experiments are vital in creating momentum and cutting across barriers

In the last event, the Armed Forces linked with four national militaries and performed a combined operational net assessment. This comprehensive analysis of enemy capabilities evaluated not only instruments

of power such as military forces, but networks and alliances, intellectual and financial resources, and other national assets. The next multinational experiment will involve six nations and focus on combined effects-based planning.

Experiments are vital in creating momentum and cutting across barriers. However, they are not the answer to every transformation challenge.

First, like all new processes and systems, it is necessary to think jointly from the outset. The joint direct attack munition (JDAM) is a success in part because it was born joint. In Desert Storm, less than 10 percent of air-to-ground bombs were laser guided and only 5 percent of air-to-ground fighters could even guide them. After the Persian Gulf War, JDAM kits were developed to provide

global positioning to all weapons delivered by Navy, Marine, and Air Force platforms. In Iraqi Freedom, nearly every air-to-ground fighter and bomber employed JDAM or other precision munitions day or night in any weather.

Second, experimenters must share information and stay connected to lessons learned from ongoing operations. Together with the Marine Corps, JFCOM recently hosted Emerald Express. Returning warfighters from five services and several coalition nations met with concept developers to discuss lessons from Iraqi Freedom and generate ideas for future experiments. This is exactly the right approach.

Third, experimentation must balance costs and risks against potential benefits. Millennium Challenge cost on the order of \$250 million, but it was a needed, innovative set of experiments. Smaller events, whether conducted independently or as part of larger exercises, also play a major role and may provide substantial benefits.

Many past experiments were born of necessity. When Americans are engaged in combat, their willingness to take risks at home increases. But in times of peace, innovation tends to follow a more cautious path. Should a pause occur in the global war on terrorism—which may take some time—experimentation can play an important role in transformation by providing an environment for continued risk-taking.

Innovation is measured by its impact on the environment. In other words, we are looking for good ideas with practical applications to solve real-world problems or create new capabilities. Above all, experimentation is a means to an end: improved joint warfighting.

Military transformation has come a long way, but the Armed Forces are still organized for the 20th century. Though it is necessary to be prepared to defeat conventional threats, terrorism is different and requires being ready for the unknown. Change implies taking risks to provide every possible advantage when going into harm's way. Warfare will always be part art and part science. Experimentation is one project in which scientific methods and creative ideas combine to generate dramatic results for joint warfighters.

RICHARD B. MYERS
Chairman
of the Joint Chiefs of Staff

You're Not from Around Here, Are You?

By IKE SKELTON and JIM COOPER

Know thy enemy. That adage has been repeated since armies first clashed on the field of battle. Understanding enemy intentions, tactics, and vulnerabilities is an essential part of warfare. But it is also necessary to know your friends. Making enemies is easy, but it is harder to make friends. The wrong approach to allied or occupied countries can quickly create enemies.

The United States has not been an occupying power since immediately after World War II. In Korea and Vietnam, where the goal was fighting and leaving, sensitivity to local culture was important, although it was not a long-term concern. In Iraq, however, a cultural divide brought to the fore issues that three generations of soldiers have considered only peripherally.

Operating in a foreign land can be a minefield. Few members of the Armed Forces will be familiar with cultural traditions of the countries in which they operate. Yet violation of local norms and beliefs can turn a welcoming population into a hostile mob.

Iraqis arrested by U.S. troops have had their heads forced to the ground, a position forbidden by Islam except during prayers. This action offends detainees as well as bystanders. In Bosnia, American soldiers angered Serbs by greeting them

with the two-fingered peace sign, a gesture commonly used by their Croat enemies. And the circled-finger "A-OK" signal was a gross insult to Somalis. The military has enough to worry about without alienating the local population.

Afghanistan and Iraq

Though it may be premature to draw definitive lessons from Afghanistan or Iraq, it is clear that the Armed Forces lack sophisticated knowledge of foreign countries. That does not dishonor their performance; cultural awareness is not a mission-essential task—but it should be.

Winning a conflict means more than subduing an enemy. While the U.S. military ran into trouble in the past, it was not because it lacked combat skills, personal courage, or the necessary resources. As operations in Afghanistan and Iraq have demonstrated, the process of restructuring the political order, economy, and social well-being of an entire country is as critical as defeating organized resistance. But it is cultural awareness that helps determine whether a host population supports long-term American military presence—and may determine the outcome of the mission.

It is uncertain whether the majority of the Iraqi people will support the multinational efforts, which many see as responsible for the unrest. Rebuilding Iraq may hinge on drawing appropriate inferences from ethnic and religious aspects of its culture—including tribal dynamics—and then properly responding to them. Commanders in Iraq have stressed the importance of being aware of these elements of the security landscape.

rebuilding Iraq may hinge on drawing appropriate inferences from ethnic and religious aspects of its culture

The Honorable Ike Skelton and the Honorable Jim Cooper are members of the House Armed Services Committee.

Flight deck fire training aboard *USS John C. Stennis*.



U.S. Navy (Mark J. Rebliss)

commentary

The House Armed Services Committee held a hearing in late 2003 to examine the lessons of Iraqi Freedom at which Major General Robert Scales, Jr., USA (Ret.), highlighted the requirement for cultural awareness among both civilian and military personnel. His testimony emphasized that had American planners better understood Iraqi culture, efforts to win the peace would have been more sound. Senior officials and commanders might have reached a different conclusion on the willingness of Iraqis to welcome the U.S. military for an extended period of reconstruction.

Events during Uphold Democracy further emphasized cultural differences:

The Army in general had little appreciation of Haitian history and culture. Few planners knew anything about Haiti other than its basic geography. In a combat operation, where overwhelming firepower achieves objectives, sensitivity for the local population's culture and traditions clearly is not a top priority. In a peace operation such as Uphold Democracy, however, knowledge of how a people think and act, and how they might react to military intervention, arguably becomes paramount. The U.S. military culture in general focuses on training warriors to use fire and maneuver and tends to resist the notion of culture awareness.¹

The need for cultural awareness is not unique to the American military. Russian soldiers in Chechnya made cultural blunders in dealing

with local civilians who, once insulted or mistreated, either supported active resistance fighters or joined them. Moreover, Russian leaders realized that they had underestimated the influence of religion in the region.

Cultural Awareness

Understanding the culture and social factors peculiar to the countries in which Americans are most likely to be deployed will make the environment work to U.S. advantage. On the lowest level, awareness means knowing enough about local culture to permit military personnel to operate effectively. Along with linguistic capability, cultural awareness can highlight political, social, and other characteristics of the operational area. It can explain why local people may see things differently from Americans. It can enable troops on the ground to understand how their attitudes and actions directly influence mission outcome.

The Armed Forces often operate as part of coalitions and alliances. Nations cannot work together without recognizing their cultural differences—where the other guy is coming from. That awareness becomes even more important over time. It is not a touchy-feely or nice-to-have social grace; it is basic intelligence on attitudes and potential actions of host nations and coalition partners. Only such insights can enable the military to understand other cultures.



U.S. Army (Gur A. Alban)

Soldiers departing for Afghanistan.

The 1940 Marine Corps manual on insurgency noted that:

*The motive in small wars is not material destruction. It is usually a project dealing with social, economic, and political development of the people. It is of primary importance that the fullest benefit be derived from the psychological aspects of the situation. That implies a serious study of the people, their racial, political, religious, and mental development. By analysis and study the reasons for the existing emergency may be deduced; the most practical method of solving the problem is to understand the possible approaches thereto and the repercussion to be expected from any actions which may be contemplated. By this study and ability to apply correct psychological doctrine, many pitfalls may be avoided and the success of the undertaking assured.*²

Stability operations and postconflict reconstruction are among the major challenges facing the military in the post-Cold War world. This was

clear even before Afghanistan and Iraq—two battlefronts in the global war on terrorism.

The Army and Marine Corps have a history of conducting such operations under the

rubric of *low intensity conflict* and *military operations other than war*. Operations in the Philippines from 1899 to 1903 and in Haiti from 1994 to 1995 also offer examples of partial success in such efforts. Other than foreign area officers, defense attachés, and Special Forces, there is insufficient cultural awareness and linguistic skill among commissioned and noncommissioned officers.

personnel must have awareness in theaters where ambiguous and contradictory situations are the norm

A combat brigade would not be deployed into hostile territory without maps. The beliefs of a culture are as critical as terrain features. The unit should have those coordinates as well.

Defining the Need

Predeployment preparations must include cultural awareness training. Just as personnel are trained in specific tactics, they should be provided an understanding of the environment where they will operate. The ability of deployed personnel to draw inferences from experience or study could contribute decisively to the national strategy.

General Scales describes the operational environment and importance of cultural awareness:

*The image of sergeants and captains acting alone in the Afghanistan wilderness and the sands of Iraq, innovating on the fly with instruments of strategic killing power, reaffirms the truth that today's leaders must acquire the skills and wisdom to lead indirectly at a much lower level. Today's tactical leaders must be able to act alone in ambiguous and uncertain circumstances, lead soldiers they cannot touch, think so as to anticipate the enemy's actions—they must be tactically proactive rather than reactive.*³

The need for cultural awareness extends beyond the foxhole. Senior officers must create an appropriate command climate. Civilian officials need to be culturally aware in developing policy and strategy. They must know that imposing American values on unwilling people in a foreign country may have undesired strategic and operational consequences. Deployed personnel must have sufficient awareness in theaters where ambiguous and contradictory situations are the norm. And because of the reliance on the Reserve components, they must have similar training.

At a minimum, training on cultural awareness should occur on two levels. The first would be focused on planners. As an interim measure, programs for flag and field grade officers would be appropriate, along with greater emphasis on cultural awareness in curricula at both the staff and war college levels. As soon as practical, that training should be extended to all officers.

One report on the experiences of general officers who served in Bosnia, Somalia, and Haiti noted the need for additional training.

*Greater emphasis must be placed on geopolitical and cultural training for the Army's officer corps. Such training must begin at the officer basic course and continue at all levels of professional military education. Officers at all grades will benefit from such training because of the likelihood that they will be involved in peace operations on multiple occasions throughout their careers.*⁴

Marines landing in amphibious exercise.



U.S. Navy/Terry M. Mallock

Training should be comprehensive and offered to both the active and Reserve components. The ideal program would reward continued learning and require that officers get an early start on becoming indirect leaders. Unit leaders would mentor their performance while undergoing instruction. Both the classroom and distance learning would stretch across career assignments. The curriculum would be historically based and thoroughly joint.

The second tier involves language and area studies. Commissioned and noncommissioned leaders must possess some language skills and understanding of nations to which they are deployed. This sort of training results in street sense—knowing how to gather intelligence from local people. That can only happen with cultural awareness. It is the level on which simple linguistic skills are essential: *Halt, lay down your weapon.* But it is better to warn of the likely consequences of such interactions with locals.

Compared to education, training involves imparting specific skills. It can be prepackaged and offered throughout a career. It is part of the daily military routine. As one officer described his experience in Bosnia:

Specialists are assigned to ensure the commanders are politically astute, historically aware, and culturally sensitized. Unfortunately, this information has

no real conduit down to company and platoon levels, and perhaps most important, to the individual soldier. In most organizations of the conventional infantry force, there is no foreign area officer or civil affairs officer who specializes in these matters to fill the gap. Although it is vital for senior leaders to be well informed in these facets of operations, it is often the company commander, platoon leader, or squad leader who finds himself . . . dealing with the civilian populace day by day.⁵

A Matter of Timing

Cultural awareness must be taught on the primary level. And knowing your enemy should be accompanied by knowing your friends. Moreover, educational and training programs should focus on those regions likely to pose threats to national security and cultures vital to long-term strategic relationships.

Mandating cultural awareness training is easier than implementing it. First, identifying which cultures to study and what level of proficiency to attain is demanding. There is no one-size-fits-all answer to cultural awareness. Nonspecific theories on cultural contexts can be detrimental, and generalizing cultural characteristics can be deceptive.

Americans are often direct in their conversations, expecting the truth with no hint of deception. At the

Crew chiefs performing final checks on F-15.



U.S. Air Force (Verlin Levi Collins)

same time, Americans also tend to be uncomfortable with silent moments. People in some other countries, though, may prefer not to be direct and may shift their eyes away from the American...a person who is reluctant to maintain eye contact is called shifty-eyed and arouses suspicion. But in some countries an attempt to maintain eye contact may be perceived as a sign of aggression. Accordingly, in Japan, South Korea, Taiwan, and other Asian countries, maintaining eye contact is not an acceptable behavior. On the other hand, in Saudi Arabia, eye contact and gestures of openness are important and could facilitate communications.⁶

Predeployment training focuses on the current military situation for all the obvious reasons. But cultural awareness training must be accomplished on a regular basis and well in advance. Thus that knowledge must already be in place before it is time to go.

The national security strategy envisions a more assertively expeditionary military. Over the last two decades, extended coalition operations have become the norm. This requires operational planning that recognizes the importance of cultural awareness. If implemented, integrated training to develop such awareness will have lasting, positive effects for plans, actionable intelligence, and the credibility of U.S. objectives. Experience

teaches that cultural awareness is a force multiplier. It is the time to be serious about enhancing our knowledge of today's world. The Armed Forces are busier than ever before, but they are not too busy to be culturally aware. **JFQ**

NOTES

¹ Walter B. Kretchik, Robert F. Baumann, John T. Fisher, *Invasion, Intervention, Intervasion: A Concise History of the U.S. Army Operation Uphold Democracy* (Fort Leavenworth, Kan.: U.S. Army Command and General Staff College, 1998), p. 188.

² U.S. Marine Corps, *Small Wars Manual* (Washington: Government Printing Office, 1940), p. 18.

³ Major General Robert H. Scales, Jr., USA (Ret.), letter to the Honorable Ike Skelton, June 12, 2003.

⁴ U.S. Institute for Peace, *Alternative National Military Strategies for the United States* (Carlisle Barracks, Pa.: Strategic Studies Institute, U.S. Army War College, 2000), p. 6.

⁵ Joel B. Krauss, "Cultural Awareness in Stability and Support Operations," *Infantry*, vol. 89, no. 1 (January/April 1999), p. 15.

⁶ Gary Bonvillian and William A. Nowlin, "Cultural Awareness: An Essential Element of Doing Business Abroad," *Business Horizons*, vol. 37, no. 6 (November/December 1994), p. 45.

This article is also published as chapter 12 in Ike Skelton, *Whispers of Warriors: Essays on the New Joint Era* (Washington: National Defense University Press, 2004), pp. 131-37.



Clausewitz and War

**Two Perspectives on
Center of Gravity**



1st Combat Camera Squadron (Jeremy T. Look)

Center of Gravity

Recommendations for Joint Doctrine

By ANTULIO J. ECHEVARRIA II

Advanced by Carl von Clausewitz, the concept of center of gravity is a popular strategic theory. Military transformation assigns a dominant role in doctrine to this concept despite its roots in the industrial age.

Yet after more than two decades of controversy, the meaning of center of gravity remains unsettled. Fortunately, some of the confusion can be eliminated by returning to its original sense. Both the concept and its analogue in the mechanical sciences have common properties: neither is a source of strength, but rather a point at which physical and psychological forces meet. As a result, doctrine should be revised—in particular, Joint Pub 3-0, *Doctrine for Joint Operations*,

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and Joint Pub 5-00.1, *Joint Doctrine for Campaign Planning*, to establish a clear understanding of the meaning of center of gravity.

Joint Doctrine

Each service has applied the concept of center of gravity differently. The Army and Navy typically thought in terms of a single center of gravity, which resided at the core of landpower or seapower and provided the source of physical and psychological capacity to fight. The Air Force, on the other hand, envisioned multiple centers, each targeted from the air to paralyze an enemy. The Marine Corps, which conducts forcible entry operations, has long regarded center of gravity as a critical vulnerability. Thus the concept has assumed many guises over the years.

In the mid-1990s the military attempted to consolidate individual service perspectives into a single definition that asserts that the essence of the operational art resides in massing effects against enemy sources of power—centers of gravity—to gain a decisive advantage. Joint Pub 3-0 defined centers as “characteristics, capabilities, or locations from which a military force derives its freedom of action, physical strength, or will to fight.” It also implied that centers exist for every level and type of war. Presumably, defeating



Stryker brigade at National Training Center.

28th Public Affairs Detachment (Rhonda M. Lawson)

tactical centers facilitates tactical objectives that contribute to the defeat of operational centers and assist in

Joint Pub 5-00.1 stresses the importance of linking centers to critical vulnerabilities

achieving operational objectives and so on until national security objectives are reached. On the strategic level, centers might include military forces, allies, national will, critical capabilities,

or national strategy. On the operational and tactical levels, they would generally consist of principal sources

of combat power such as modern, mobile, or armored forces that can assure or prevent mission accomplishment. In other words, Joint Pub 3-0 strove for consensus by drawing together service predilections. In doing so, however, it defined centers broadly and offered no method for determining them.

Joint Pub 5-00.1, which appeared in January 2002, builds on Joint Pub 3-0 and provides a general method for determining centers of gravity. It defines the concept like Joint Pub 3-0, except that *locations* is replaced by *sources of strength*. In addition, it states that centers consist of “those aspects of the adversary’s overall capability that, theoretically, if attacked and neutralized or destroyed will lead either to the adversary’s inevitable defeat or force opponents to abandon aims or change behavior.” Thus it is a capabilities-based definition that is derived from the sum of enemy capabilities despite terms such as *characteristics* and *sources of power*. Moreover, Joint Pub 5-00.1 stresses the importance of linking centers to *critical vulnerabilities*, enabling an attack through weak points in the overall system. Similar to the approach adopted by the Marine Corps, centers of gravity and critical vulnerabilities



Washington at Princeton.

Painted by D. McLellan (DVIC/NARA)

Recommendations for Joint Doctrine

- To align the definition of center of gravity with the Clausewitzian concept and bring it back under control, doctrine in general and Joint Pubs 3-0 and 5-00.1 in particular should redefine it as focal point—the element with centripetal force to hold everything together and provide raw power, purpose, and direction.
- Planners should refrain from applying the concept to every kind of war or operation to reduce competition with political-military objectives. We must ask whether the total military collapse of an enemy is commensurate with our political objectives and end-state.
- If total collapse is desired, planners should identify the connections and gaps in an entire enemy structure or system before deciding whether a center of gravity exists. The concept does not apply where the enemy is not connected enough to act with unity. Also, given the anticipated proliferation of chemical, biological, radiological, nuclear, and high-explosive weapons, there could be times when it is dangerous to assume that individual enemy segments can be defeated by a single knockout blow. If several al Qaeda cells were armed with such weapons, for instance, striking one could trigger massive retaliation. Continued proliferation and information technologies could make the concept of center of gravity academic in the future.
- Employing the concept means learning to think more about the desired effects and less about capabilities to be destroyed, all without denigrating the importance of those capabilities.
- Centers of gravity can change during a conflict if, for example, allies enter or leave the fight, or other changes occur within the combatants' power structures. We must therefore reassess any previous determination of a center. We should reevaluate whether we need to attack centers that are so transitory they can quickly be replaced. Perhaps we have only found a center of critical capability.
- Resist dissecting an enemy into tactical, operational, and strategic centers of gravity. Efforts and intermediate objectives should largely be focused on destroying the center. Creating subunits is artificial unless an enemy is too dispersed or decentralized to have a dominant center of gravity. Then it may be possible to trace individual centers to a central one.

JFQ

are regarded as different but complementary ideas. Identifying the latter will focus efforts on something that can achieve decisive results. Critical vulnerabilities will provide knowledge on attacking centers of gravity, but as one military analyst explained, using this concept in planning “leads you to see very quickly that some vulnerabilities are interesting but a waste of resources because they do not lead anywhere useful in the end.”¹

The process described in Joint Pub 5-00.1 does not lead to center of gravity, but rather to a set of critical capabilities. It seems to rely on an approach developed by Joseph Strange, who concluded that service definitions lacked precision and tended to equate centers of gravity with physical vulnerabilities or strengths without enough attention to psychological centers of power.² To redress that notion, Strange redefined centers as “dynamic agents of action or influence,” as specific “moral, political, and physical entities that *possess* certain characteristics and capabilities, or benefit from a given location/terrain.” Moreover, he defined

centers of gravity in relationship to capabilities, requirements, and vulnerabilities. Key combat forces, for example, may be centers if they possess critical capabilities. Those capabilities—to shoot, move, and communicate—have critical requirements such as open lines of communication that enable them to continue operating. A requirement that is inadequately protected—such as enemy lines of communication near Inchon during the Korean War—constitutes a critical vulnerability. Neutralizing critical vulnerabilities would contribute to defeating the enemy center of gravity.

Strange links centers of gravity to critical vulnerabilities in a way that war planners can put into practice. However, since any number of “dynamic agents of action or influence” can exist in a given battlespace, his approach does not focus resources on elements that will prove decisive. His methodology lacks criteria for determining what makes one dynamic agent more important than another. Moreover, since he does not build on the Clausewitzian definition, in which center of gravity serves as a focal point, his interpretation is capabilities-based and tautological. In fact,

centers for Strange are important because of their critical capabilities. Although this approach can link critical strengths or capabilities to critical vulnerabilities, it will bring planners to an actual enemy center of gravity as opposed to a center of critical capability only by coincidence.

The definition in Joint Pub 5-00.1 and its approach to determining centers of gravity thus begs the question: Why not just call centers of critical capabilities what they are?—critical centers or critical points. Although identifying enemy centers of critical capabilities can be useful, as will be seen in the definition by Clausewitz, an enemy might not have a center—at least not one that can be attacked. In those cases one should focus on destroying critical capabilities. It stands to reason that neutralizing them will eventually lead to accomplishing objectives.

The Clausewitzian Concept

The Prussian philosopher of war apparently derived his concept of center of gravity in part from Paul Erman,

Guided missile
cruisers.



U.S. Navy (Daniel J. McLain)

a physicist who taught at the University of Berlin and *Allgemeine Kriegsschule* (war college). Clausewitz was director of the latter institution from 1818 to 1830 and exchanged ideas on the mechanical sciences with Erman.

For Clausewitz and his contemporaries, center of gravity represented the point where the forces of gravity converge within an object in the context of modern elementary physics. Striking an object with enough force will usually cause it to lose its equilibrium and

fall. Center of gravity is therefore not a source of strength but a factor of balance. The strength of an infantryman, for example, can be attributed to his muscles, brains, or weapons in any combination, but it relates to center of gravity only so far as he needs to be balanced to use them. Conversely, a soldier might be physically frail, intellectually challenged, or lack for weaponry, but these conditions have little effect on his equilibrium. Strictly speaking, a center is neither a strength nor a weakness, though striking it can compromise the former or exploit the

latter. Directing a blow with enough force against the center of gravity of an infantryman could lay him low regardless of his strengths and weaknesses because this center is connected to his physical characteristics.

Most definitions of the concept of center of gravity are based on the

center of gravity connects various strengths of the soldier without being a strength itself

translation of *On War* by Michael Howard and Peter Paret, especially book six (Defense) and book eight (War Plans). It is “always found where the mass is concentrated most densely,” serves as “the hub of all power and movement, on which everything depends,” and emerges from the “dominant characteristics of both belligerents.”³ Unfortunately, this version creates a false impression that centers of gravity are akin to sources of strength:

*The first principle is that the ultimate substance of enemy strength must be traced back to the fewest possible sources, and ideally to one alone. The attack on these sources must be compressed into the fewest possible actions—again, ideally, into one. . . . The task of reducing the sources of enemy strength to a single center of gravity will depend on: 1) the distribution of the enemy’s political power. . . 2) the situation in the theater of war where the various armies are operating.*⁴

A closer look at the German original reveals that Clausewitz never used source (*Quelle*). Instead he advised tracing the full weight (*Gewicht*) of an enemy force (*Macht*) to as few centers of gravity as possible. Like the example of physics, center of gravity connects various strengths of the soldier without being a strength itself. A more literal translation is:

. . . to trace the full weight [Gewicht] of the enemy’s force [Macht] to as few centers of gravity as possible, when feasible, to one; and, at the same time, to reduce the blow against these centers of gravity to as few major actions as possible, when feasible, to one. . . .

Amphibious assault vehicles.



Battle of New Orleans.



Lithograph by Kurz and Allison (DVIC/NARA)

Fleet Combat Camera, Atlantic (Bren Ato)

Reducing the enemy's force to one center of gravity depends, first, upon the [enemy's] political connectivity [or unity] itself... and, second, upon the situation in the theater of war itself, and which of the various enemy armies appear there.⁵

Enemy Cohesion

References to center of gravity in the text indicate that the concept remains valid only when an enemy has sufficient unity or interdependence (*Zusammenhang*) to act as a single body. *Just as the center of gravity is always found where the mass is most concentrated, and just as every blow directed against the body's center of gravity yields the greatest effect, and—more to the point—the strongest blow is the one delivered by the center of gravity, the same is true in war. The armed forces of every combatant, whether an individual state or an alliance of states, have a certain unity and thus a certain interdependence [or connectivity—Zusammenhang]; and where such interdependence exists, one*

can apply the concept. Accordingly, there exist within these forces certain centers of gravity which, by their movement and direction, exert a decisive influence over all other points; and they exist where the forces are most concentrated. However, just as in the world of inanimate bodies where the effect on a center of gravity has its proportions and limits determined by the interdependence of the parts, the same is true in war.⁶

In other words, before applying the concept to war planning, one must determine whether an enemy will act

as a single entity. If so, we should look for connections among its parts to discover what holds them together. In 1809, for example, Napoleon had to fight on two fronts: against Anglo-Spanish

forces in Spain and the Austrians in Central Europe. Although they had a common enemy, the Anglo-Spanish and Austrians did little to coordinate their efforts. Hence it would have been correct for Napoleon to look for two centers of gravity, one on each front. As Clausewitz stated, the degree of unity formed by forces and the geographical spaces in which they have to fight can create more than one center. He advocated tracing multiple centers of gravity back to a single one. Yet he allowed that a lone center of gravity might not exist. The key question,

then, is whether enemy forces are connected sufficiently so actions against them in one area will have a decisive effect in other areas.

Second, center of gravity refers to an element that holds enemy forces together or, in other words, serves as a focal point. Indeed, this becomes clear in a popular passage from book eight which actually described center of gravity as it applies to war plans:

What theory can admit to thus far is the following: Everything depends upon keeping the dominant characteristics of both states in mind. From these emerge a certain center of gravity, a focal point [Zentrum] of force and movement, upon which the larger whole depends; and, it is against the enemy's center of gravity that the collective blow of all power must be directed.⁷

To find a center in any particular situation, one must look for whatever provides an enemy with a certain centripetal (center-seeking) force as opposed to centrifugal force, which is outward-seeking. Clausewitz pointed out that in the campaign against France in 1814, the allied center of gravity lay more with the Prussians under Field Marshal Blücher than the Austrians under Prince Schwarzenberg. Blücher, “although weaker than

Schwarzenberg [100,000 versus 140,000], was nonetheless the more important adversary due to his enterprising spirit; hence, the center of gravity lay more with him and it pulled the others in his direction.”⁸ In the actual campaign, Napoleon (with 75,000 men) defeated the Prussians, then turned on the Austrians and drove them back. Nonetheless, Blücher and Schwarzenberg recovered and bested Bonaparte a month later. Clausewitz argued that Napoleon should have pursued and crushed Blücher—the allied center. Such a victory would have induced the Austrians to withdraw. Like mechanical sciences, military centers have a centripetal quality; they represent a focal point where forces come together.

Clausewitz provided several examples of focal points. The centers of gravity of Alexander the Great, Gustavus Adolphus, Charles XII of Sweden, and Frederick the Great rested with their armies. Under different circumstances, the personalities of leaders, capital, or network of allies and their community of interests might fill that function. What these elements share in common is not that they are sources of power; rather they perform a centripetal function that holds systems of power together and in some cases provides direction. But military force is

not strictly a source of power. Rather, it is a focal point for drawing power from various sources: population (recruits), industry (weapons and matériel), and agriculture (food). The same holds true for the personalities of leaders, capital, or alliance networks, which draw raw power and then refine and redirect it.

Cause and Effect

Center of gravity focuses on achieving a specific effect: collapse of an enemy. Hence it is an effects-based rather than capabilities-based approach. These approaches are linked. Attacking specific capabilities produces certain effects. Achieving them often requires attacking specific capabilities. Indeed, one could say that these approaches represent two sides of the same coin. In the capabilities-based approach, the first step is identifying key enemy strength that could prevent one from achieving his objective. In the effects-based approach, the first step is identifying the desired effect and determining what actions are needed. Frequently such actions might go beyond neutralizing or destroying specific capabilities. The capabilities-based approach seeks a negative aim, destroying a capability. The effects-based approach pursues a positive aim, creating a certain effect. The Armed Forces have gotten into the habit of narrowly focusing on the former but could benefit from the broader approach of the latter.

In one sense, the Clausewitzian effects-based center of gravity resembles an emerging concept known as effects-based operations more than the current capabilities-based notion, with the exception that only one particular effect is sought—total collapse of an enemy. For Clausewitz, the effect and the objective—total collapse—were always the same. Effects-based operations have the benefit of forcing political and military leaders to focus on the specific effects they want military and nonmilitary action to achieve.

Like effects-based operations, center of gravity requires the ability to reasonably predict how to achieve at least first- and second-order effects and possibly more. Yet the Prussian considered the calculation of a center of gravity a matter of “strategic judgment” on the



Marching into Mexico City.

Painting by Tom Lovell (DVC/NARA)

highest levels. Given his distaste for prescriptive formulae, it is doubtful he would have approved of current efforts to make such calculations by means of information technology and software. On the other hand, he would certainly have supported educating leaders to develop their strategic judgment in order to make such determinations. That theme runs throughout *On War*.

Moreover, Clausewitz did not distinguish between tactical, operational, or strategic centers of gravity. Center is

center is defined in terms of the entire system or structure of an enemy, not by a level of war

defined in terms of the entire system or structure of an enemy, not by a level of war. A soldier can have only one at a time. Accordingly, a local commander might determine a center for enemy forces directly opposing him, providing that the forces are sufficiently removed from their comrades. However, this separate center would only be local rather than either tactical or operational. To isolate such a center, levels of war would have to exist independently. Using the concept of center

of gravity should have a unifying effect on tactical, operational, and strategic efforts. Dividing centers of gravity into tactical, operational, and strategic elements only leads to centers of critical capability.

Clausewitz emphasized that centers of gravity should only be sought in wars designed to defeat an enemy completely. Only vast energy and resources aimed at decisive victory cause such centers and their areas of influence to emerge. In such wars, military and political objectives—the total political and military defeat of an enemy—essentially complement each other. To achieve the total collapse of an enemy, one should strike at its center. In limited wars, on the other hand, centers compete with the typically more restricted political objectives. For example, the ground component planning staff of U.S. Central Command spent more effort in trying to identify the Iraqi center of gravity during the Persian Gulf War than planning its defeat. Ironically, under the Clausewitz concept, that determination would have been unnecessary since Desert Storm was not a war of annihilation. Simply

translating strategic objectives—the expulsion of Iraq from Kuwait and reduction of enemy offensive capabilities—into operational and tactical objectives should have given Coalition forces all the necessary operational guidance. This is not to say that the concept only applies in wars of annihilation; but it is neither appropriate nor necessary in all cases.

Determining Centers

Defining center of gravity is only half of the battle. Planners must find a practical way to determine the center for specific enemies. The method should be simple, in keeping with the Clausewitzian dictum that in war even the simplest thing is difficult; yet it should use the best intelligence available and accommodate revision as the result of rigorous analysis.

Determine whether identifying and attacking a center of gravity is appropriate for the war being waged. The campaign against al Qaeda, though part of the larger global war on terrorism, is essentially a conflict that cannot end without neutralizing or destroying that group; hence the identification and pursuit of center of gravity serves a constructive purpose.

Determine whether the enemy structure or system is sufficiently connected to be treated as a single body. Al Qaeda has numerous cells globally, and most do not know the others exist. Some of these cells or individuals within them appear to have been linked to group leadership by networked electronic communications. Messages and commands were thus passed via the Internet, cellular phones, and other electronic devices. It is also possible that some cells have orders and will attempt to execute them at a certain time and place if they receive no guidance to the contrary. Thus the physical links are intermittent at best. Successful operations against cells in Europe will not likely cause those in Singapore to collapse. The group's psychological links appear strong. If cells are not well linked physically, they have strong ideological ties. Perhaps we should seek an ideological center of gravity.

Determine what element has centripetal force to hold the system together.



Rough Riders on San Juan Hill.

U.S. Army (William Druwiedle)



Last shot fired.

U.S. Army (Morris Fineberg)

One ideological element appears to have sufficient centrifugal force to bind al Qaeda: avowed hatred of apostasy. It is probably that loathing, rooted in a radical Islam, that serves as center of gravity rather than Osama bin Laden. While he admittedly laid much of the groundwork to establish al Qaeda, it does not appear that his removal will bring collapse. Most intelligence analysts claim that even if bin Laden was captured or killed, someone would replace him. He can only be more or less effective. Thus leadership really amounts to a center of critical capability; it is an element that should be neutralized, but its absence will not end the war in itself.

Instead, the hatred of apostasy draws raw power—recruits, money, and support of other states—and motivates members to wage a particular style of asymmetric warfare. Thus decisive defeat will require neutralizing that center. However, accomplishing

that defeat will mean employing the diplomatic and informational elements of national power as deliberately as the military one. It will also require the support of moderate Islam.

The Armed Forces have reached a critical point. On the one hand, the concept of center of gravity could be replaced by *center of criticality* to more accurately represent its original meaning. Then center of gravity can be deleted from the military lexicon. On the other hand, if the concept is retained to focus on an element that compels an enemy to collapse, center of gravity should be redefined to mean focal point. By choosing the latter path, planners would be better positioned to incorporate ideas such as effects-based operations. But the concept must be applied judiciously. At a time when an enemy can operate in a decentralized manner globally, certain situations may arise in which the idea does not apply and pursuing it will not benefit warfighters. **JFQ**

NOTES

¹ Huba Wass de Czege, "Clausewitz: Historical Theories Remain Sound Compass References: The Catch Is Staying on Course," *Army*, vol. 38, no. 9 (September 1988), p. 42.

² Joe [Joseph L.] Strange, *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can All Speak the Same Language*, Perspectives on Warfighting Series, no. 4, 2^d ed. (Quantico, Va.: Marine Corps Association, 1996).

³ Carl von Clausewitz, *On War*, edited and translated by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1989), pp. 485–86, 595–96.

⁴ Clausewitz, *On War*, p. 617. In fairness to Howard and Paret, their translation is more interpretive than literal by their own admission. They could not have foreseen the extent to which the U.S. military would take their interpretation of center of gravity literally.

⁵ See Carl von Clausewitz, *Vom Kriege*, 19th ed. (Regensburg, Germany: Pustet, 1991), pp. 1009–10.

⁶ *Ibid.*, pp. 810–11.

⁷ *Ibid.*, pp. 595–96.

⁸ *Ibid.*, p. 324.

über

Krieg und Kriegführung

von

General Carl von Clausewitz.

Interpreting the Legacy of Clausewitz

By CHRISTOPHER BASSFORD

When Clausewitz wrote his famous opus, *On War*, little did he realize that a new industry had been born. Interpreting, reinterpreting, and artfully refining—not to mention plagiarizing—his ideas on war has been a minor but profitable cottage industry ever since.

Clausewitz knew the limits on intellectualizing about war; his concept of friction applies not only to the practical conduct of war, but also to the difficulty of thinking clearly about it. Because war involves many variables,

including chance, individual and organizational mindsets are quickly overwhelmed and events tend to escape control. Consequently, he sought to identify key variables and explore their complex relationships, for “in war more than in any other subject . . . the part and the whole must always be thought of together.” It is easy as well as dangerous to be mesmerized by discrete, equivocal Clausewitzian terms, such as *real war*, *culminating point*, *critical analysis*, or *center of gravity*, and lose track of their connectivity. Like disputations among theologians over matters of faith, some analysts become lost in theoretical hair-splitting and an attempt to overdefine principles that, by their very nature, are mutable and dependent on the context.

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U.S. Army

But it is inevitable that all the terminology and technical expressions of a given [theoretical] system will lose what meaning they have, if any, once they are torn from their context and used as general axioms or nuggets of truth that are supposed to be more potent than a simple statement.

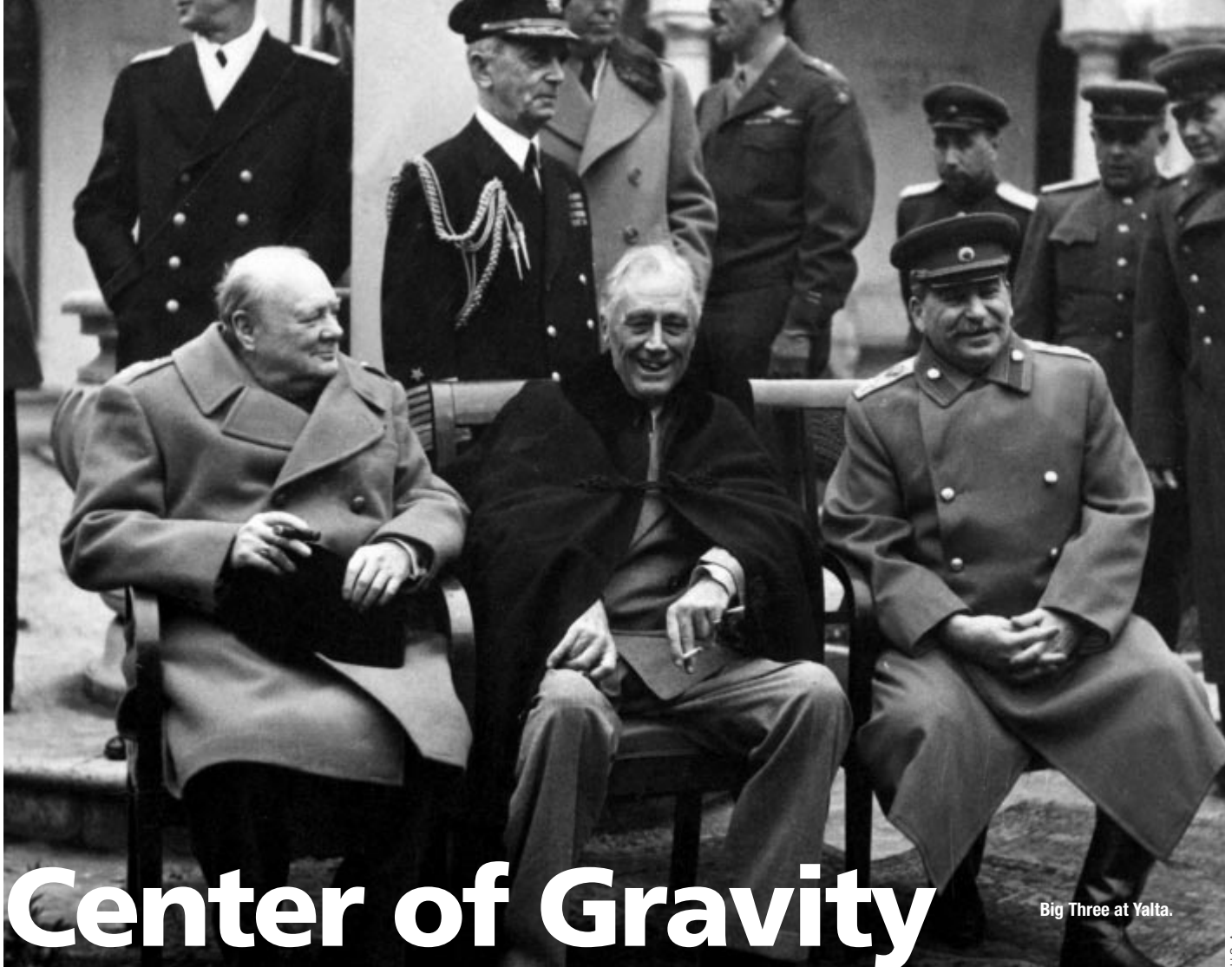
—Carl von Clausewitz

Clausewitz was interested in fundamental truths on war. He sought to develop concepts of universal applicability to the past and an unpredictable future, while most analysts are concerned with the political-military issues of the day, tending to narrow and redefine concepts in specialized ways. A classic case is the adaptation of the concept of *trinity* by Harry Summers in the aftermath of the Vietnam War. Clausewitz argued that the course of war is driven by complex and inherently unpredictable interactions that occur as conflicting human intentions, driven by rational calculation (policy) and violent, irrational emotion, hit the proverbial fan of reality. Addressing the crisis in the 1970s, Summers recast that dynamic trinity as a fixed, triangular relationship among “people, army, and government.” Recognizing

that these elements had become fatally disconnected during the Vietnam conflict was helpful in provoking reform in the military. But the simplified model of people, army, and government offers little guidance for action in the world today.

Similar accounts can be found of other isolated concepts in *On War*, helping to explain how this Prussian military philosopher, long since dead, managed to evolve from being the apostle of total war during the 1920s to the preeminent strategist of limited war by the 1970s.

There is nothing wrong with such an intellectual evolution, for one must always adapt to the task at hand. Nonetheless, it is always necessary to be mindful of the context and intentions of a theoretician. The latest chapter in the what-Clausewitz-really-meant debate can be revealing, as illustrated by the two accompanying articles in this issue of *Joint Force Quarterly*. But it can also inflict elaborate unspoken assumptions and produce rigid tools exquisitely overadapted for a global security environment that has vanished. **JFQ**



U.S. Army

Center of Gravity

What Clausewitz Really Meant

By JOSEPH L. STRANGE and RICHARD IRON

The Armed Forces have come a long way in understanding centers of gravity and critical vulnerabilities. The former are equated to strength; the latter to weakness. As stated in *The Joint*

Staff Officer's Guide, multiple centers of gravity may exist on a given level of warfare and change during a campaign, sometimes unexpectedly when an enemy shifts "the weight of its attack, thus uncovering or relying on a previously unforeseen center of gravity."

Nevertheless, ambiguities abound. That same publication contains the following statement: "Centers of gravity are the characteristics, capabilities, or locations from which a military force

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Beachhead on Okinawa.

U.S. Coast Guard

derives its freedom of action, physical strength, or will to fight. On the strategic level, centers of gravity might include a military force, an alliance, a set of critical capabilities or functions, or national strategy itself." According to this definition a military force cannot be a center of gravity, yet it is cited as an example. It also presents a choice among characteristic, capability, or location, when in reality all three exist simultaneously in mutual dependency. A force operating in a given location is ineffective without essential characteristics and capabilities. Moreover, the use of terms such as *foundation of capability*, *hub of all power and movement*, and *dominant characteristics* is ambiguous enough. And worse, they are invariably accompanied by an expansive list of examples that include alliances, communities of interest, public opinion, and "national strategy itself."

A Collision of Centers

To understand centers of gravity, one must be grounded in the original context of *On War*. Book one defines warfare as "an act of force to compel

our enemy to do our will," which entails a "collision of two living forces."¹ Much of the work is focused on war as a clash between armed forces and the use of physical force to "throw an opponent" to break his will to resist. Chapter 27 in book six develops "the nature and effect of a center of gravity" in the context of "several theaters of operation" in which "division of forces then becomes inevitable. . . . A center of gravity is always found where the mass is concentrated most densely. It presents the most effective target for a blow; furthermore, the heaviest blow is that struck by the center of gravity." Clausewitz drove to the heart of the matter in chapter 28: "A major battle in a theater of operations is a collision between two centers of gravity; the more forces that can be concentrated in a center of gravity, the more certain and massive the effect. Consequently, any partial use of force not directed toward an objective that either cannot be attained by the victory itself or that does not bring about the victory should be condemned."

Misunderstanding Book Eight

In book six (Defense), Clausewitz offers a clear discussion of opposing armies as centers of gravity. But in book eight (War Plans), he applies the term to the broader realm of national and coalition (or grand) strategy, as opposed to the operational and tactical levels. On the strategic level, the army may be just one among several centers of gravity: "In countries subject to domestic strife, the center of gravity is generally the capital. In small countries that rely on large ones, it is usually the army of their protector. Among alliances, it lies in the community of interest, and in popular uprisings it is the personalities of the leaders and public opinion." Moreover, chapter 4 ("Closer Definition of the Military Objective: The Defeat of the Enemy") of book eight contains perhaps the most quoted passage regarding centers of gravity: "One must keep the dominant characteristics of both belligerents in mind. Out of these characteristics a certain center of gravity develops, the hub

of all power and movement, on which everything depends. That is the point against which all our energies should be directed.”

The discussion of centers of gravity in book eight is much less precise and is the source of misunderstanding

the discussion of centers of gravity is much less precise and is the source of misunderstanding

for two reasons. First, the Howard and Paret translation of *On War*, the most commonly used English edition, may have confused some aspects of the original text. Moreover, some interpretations have taken the original out of context. Notwithstanding possible mistranslations, Howard and Paret are usually clear and consistent—provided the text is interpreted within the context of the relevant passages elsewhere.

Even in Howard and Paret, book eight supports the notion of armies or their components functioning as physical centers of gravity on the strategic level. For example: “For Alexander, Gustavus Adolphus, Charles XII, and Frederick the Great, the center of gravity was their army. If the army had been destroyed, they would all have gone down in history as failures.”

Secondly, commonly overlooked or ignored is the very large paragraph in *On War* that precedes the “dominant characteristics” and “the hub of all power and movement” passages quoted earlier. There Clausewitz explained the relationship between a capital city and a defending army in several different scenarios.

If Paris had been taken in 1792 the war against the Revolution would almost certainly for the time being have been brought to an end. . . . In 1814, on the other hand, even the capture of Paris would not have ended matters if Bonaparte had still had a sizeable army behind him. . . . Again, if in 1812 Bonaparte had managed, before or after taking Moscow, to smash the Russian army. . . the fact that he held the capital would probably have meant that he could make peace in

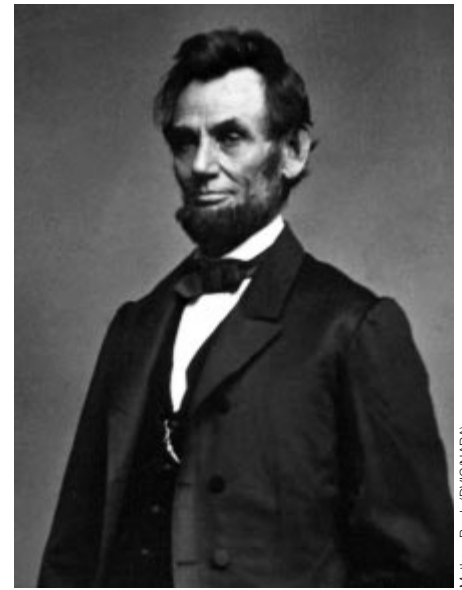
spite of the enormous area still unoccupied. In 1805 Austerlitz was decisive. The possession of Vienna and two-thirds of the Austrian territory had not sufficed to bring about a peace. On the other hand, after Austerlitz the fact that Hungary was still intact did nothing to prevent peace being made. The final blow required was to defeat the Russian army. . . . Had the Russian army been with the Austrians on the Danube in 1805 and shared in their defeat [referring to Ulm], it would hardly have been necessary to take Vienna; peace could have been imposed at Linz.²

Third, “the hub of all power and movement” must be understood in the broader context of the remarks found in chapter 27 of book six. The following passage appears immediately after the sentence “A center of gravity is always found where the mass is concentrated most densely.”

The fighting forces of each belligerent—whether a single state or an alliance of states—have a certain unity and therefore some cohesion. Where there is cohesion, the analogy of the center of gravity can be applied. Thus these forces will possess certain centers of gravity, which, by their movement and direction, govern the rest; and those centers of gravity will be found wherever the forces are most concentrated.

Here the phrase “hub of all power and movement” refers unequivocally to the main bodies of the opposing forces. This point is supported by a passage on the same page: “It is therefore a major act of strategic judgment to distinguish these centers of gravity in the enemy’s forces [that is, *concentrations* in their total force] and to identify their spheres of effectiveness [and influence]. One will constantly be called upon to estimate the effect that an advance or a retreat by part of the forces on either side will have upon the rest.”

The phrase “where there is cohesion” causes confusion. One commentator contends that *where* should be read as *if*. But based on the previous sentence it can be inferred that Clausewitz meant that although the degree of unity and cohesion is small, the concept still applies. Nor should concept



Matthew Brady (DVC/NARA)

be based only on cohesion, that is, interdependence or connectivity (*Zusammenhang*).³ Consider the next to the last sentence in chapter 27: “Our position, then, is that a theater of war, be it large or small, and the forces stationed there, no matter what their size, represent the sort of unity in which a single center of gravity can be identified. That is the place where the decision should be reached.” Finally, it is difficult to conceive of a mass of an armed force acting as a physical center of gravity that does not also function as a “hub of all movement and power” and as a glue that holds everything together.

Fourth, even the term *dominant characteristics* has often been applied devoid of the context. The next sentence in the Howard and Paret version reads: “Out of these [dominant] characteristics a certain center of gravity develops, the hub of all power and movement.” Note the use of the terms *out of* and *develops*; the sentence does not read “One of these characteristics will emerge as a center of gravity.” Moreover, Clausewitz elaborates on one such characteristic—cohesion.

There is a decided difference between the cohesion of a single army, led into battle under the personal command of a single general, and that of an allied force extending over 250 or 500 miles, or even operating against different fronts. In the one, cohesion is at its strongest and unity



Pearl Harbor.

U.S. Navy



Inchon.

U.S. Marine Corps (WW. Frank)

[another characteristic] *at its closest. In the other, unity is remote, frequently found only in mutual political interests [another characteristic], and even then rather precarious and imperfect; cohesion between the parts will usually be very loose, and often completely fictitious.*⁴

In this context, cohesion, unity, and political interests are clearly not viewed as candidate centers of gravity.

They are variables that determine which armies or their components function as centers. Moreover, Clausewitz described these three characteristics in stark terms: unity of effort is remote because precarious and imperfect coalition political interests cause weak or fictitious cohesion—so much so that, like Napoleon, more often than not

they would be weaknesses akin to the concept of critical vulnerabilities today, not powerful centers of gravity.

Fifth, at the end of the chapter, Clausewitz indicates that “[book eight] will describe how this idea of a center of gravity in the enemy’s force operates throughout the plan of war.” Note that it is not *contributing* to the strength of an enemy nor *associated indirectly* with an enemy. Even in the Howard and Paret translation, the “hub of all power and movement” can

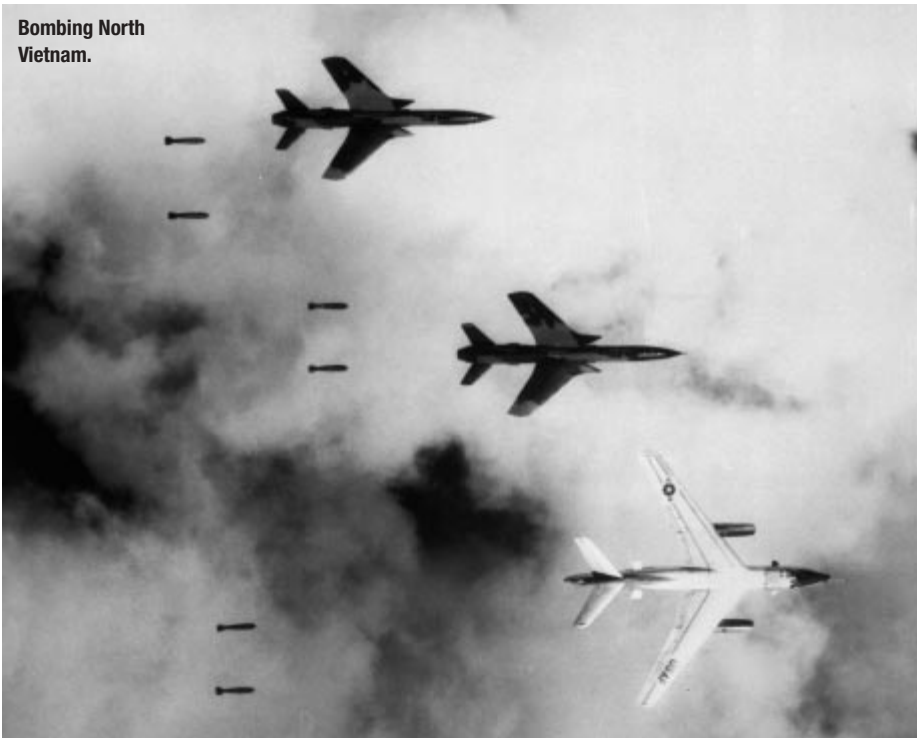
be seen in the proper light as the center of power or mass of a force, not a secondary element or characteristic from which power emanates or around which it revolves. Moreover, this interpretation is reinforced by the first reason for misinterpreting the concept of center of gravity.

Alternative Translations

The description of center of gravity as “the hub of all power and movement” has appeared several times in this analysis. Actually, these words belong to Howard and Paret, not Clausewitz. He meant something rather different in the phrase *ein Zentrum der Kraft und Bewegung*, which is translated as “a center of power and movement.” The actual difference is small but significant. The analogy of a center of gravity as a hub of a wheel came from the translation, and the current concept has been shaped by its words.

While one should not adhere dogmatically to 180-year-old definitions, the original concept of center of

Bombing North Vietnam.



U.S. Air Force (Cecil J. Poss)

gravity was simpler than those found today in references such as the *NATO Glossary of Terms and Definitions*: “Those characteristics, capabilities, or localities from which a nation, an alliance, a military force, or other grouping derives its freedom of action,

there is no doubt that Clausewitz meant center of gravity as the main strength of an enemy

physical strength or will to fight.” Students of history may consider panzer groups and the Army of Northern Virginia or Winston Churchill and Abraham Lincoln as centers. It takes considerable imagination to regard any of those military formations or leaders as “characteristics, capabilities, or localities,” while they are undoubtedly centers of gravity.

This confusing definition is the root of disagreement on centers of gravity. It is so open to interpretation that analysts can view the same situation in a variety of ways. Hours are wasted in fruitless argument that could be better spent on planning.

The concept is much simpler. There is no doubt that Clausewitz meant center of gravity as the main strength of an enemy. The mechanics analogy as rendered by Howard and Paret states: “A center of gravity is always found where the mass is concentrated most densely. It presents the most effective target for a blow; furthermore, the heaviest blow is struck by the center of gravity.” According to a translation by J.J. Graham published in 1874: “As a centre of gravity is always situated where the greatest mass of matter is collected, and as a shock against the centre of gravity of a body always produces the greatest effect, and further, as the most effective blow is struck with the centre of gravity of the power used, so it is also in war.”⁵

The Graham translation is more literal, conveying a slightly different and clearer meaning. Note that Clausewitz was talking about the center of gravity having an *effect* on an enemy, and the blow it strikes is the most effective—not necessarily the heaviest. But both translations leave no doubt that reference is made to something physical that can strike blows. There is

no indication of alliance cohesion, lines of communication, or seaports.

According to one analyst, the original German text is more specific than Howard and Paret or Graham in “that a center of gravity is a center of strength.” The term *Schwerpunkt* (center of gravity) appears 51 times in support of this reading. Moreover, *Macht* [power] appears eight times in conjunction with *Schwerpunkt*. Chapter 9 of book eight in the Howard and Paret version “leaves out *Macht* quite a bit, and so leaves the door open for misinterpretation.”⁶

The Adversarial Element

According to the Howard and Paret edition, “One must keep the dominant characteristics of both belligerents in mind. Out of these characteristics a certain center of gravity develops.” But there is another meaning in the original text: *Es kommt darauf an, die vorherrschenden Verhältnisse beider Staaten im Auge zu haben. Aus ihnen wird sich ein gewisser Schwerpunkt . . . bilden.*⁷ Graham rendered this passage as “the great point is to keep the overruling relations of both parties in view. Out of them a center of gravity . . . will form itself.”

That translation includes an essential ingredient that is missing in Howard and Paret: what is important is the *adversarial* nature of centers of gravity. Clausewitz described centers emerging from the “overruling relations (*Verhältnisse*) of both parties”; that is, a center of gravity is relevant only in relation to an enemy. It is not an isolated concept. In the Civil War, the Army of Northern Virginia was a center of gravity because of the threat it posed to Washington and its ability to block the march of the Army of the Potomac on the Confederate capital of Richmond.

The Republican Guard constituted a center of gravity in 1991 not only because it was well trained and equipped, but because it was a threat to VII Corps. It was again identified as a center in 2003 because it was vital to the defense of Baghdad. However,



German soldier,
World War II.

Unknown (DVIC/NAPFA)

Paret. Instead the term *dominant characteristics* was introduced. This is the origin of the NATO definition—a mis-translation of the original. It implies that center of gravity could exist in its own right and is a function of “nation, alliance, military force, or other grouping” taken in isolation. This assumption is obviously wrong. Nothing in war is vital except in the context of the balance between combatants. And using the English term *characteristic* permits inclusion of virtually anything as a center of gravity: logistics, road networks, unit cohesion, or radar systems. This confuses planners. The official definition is a long way from a strength that strikes “the most effective blow,” although many examples quoted in doctrine are precisely those Clausewitz would recognize, contrary to the formal definition.

Clausewitz would recognize the evolving concept of effects-based operations. A center of gravity exists because of its *effect* on an enemy or situation (for instance, striking a heavy blow), not because of its inherent capabilities. A center needs certain capabilities as well as characteristics and locations to achieve the effect, but that effect is the starting point, not the capability.

Moral Centers of Gravity

It is possible to defeat an enemy, destroy its industry, and occupy its land. But if the spirit of resistance burns in the hearts of its people, one cannot claim victory. It might be possible to subjugate an enemy in the short term, but who can doubt that trouble will arise in the long run? It is difficult

to envisage, for instance, that the Israeli Defense Force can achieve lasting peace in the Occupied Territories while the Palestinians believe they are being wronged. That is a powerful example of a strong-willed people who lack conventional military power but are determined to fight indefinitely for their cause.

with the gift of hindsight, the *Fedayeen* were briefly more worrisome because of their grip on cities along supply lines from Kuwait. While the Kurdish *peshmerga* may have relished fighting the *Fedayeen*, the Republican Guard with its superior firepower, mobility, and protection were a more potent center of gravity. Thus centers of gravity are formed out of the relationships between two forces. Although the Iraqi operational center of gravity may have been the Republican Guard against the Kurds, it was more likely the asymmetric *Fedayeen* forces against the Coalition.

Clausewitz maintained that once an enemy decides to engage in a contest of physical and moral strength, centers of gravity are “active agents”



Kuwait.

Joint Combat Camera (David McLood)

until it ends. Physical centers function as active agents that endeavor to destroy enemy capabilities and the will to resist, and moral centers function as active agents to influence or control physical centers.

Nevertheless, the adversarial element in the concept of centers of gravity is largely missing in Howard and

Desert Storm.



U.S. Army (Robert L. Reeve)

Clausewitz understood the phenomenon of popular will. According to Howard and Paret, “The moral elements are the most important in war. They constitute the spirit that permeates war as a whole, and at an early stage they establish a close affinity with the will that moves and leads the whole mass of force. . . . History provides the strongest proof of the importance of moral factors and their often incredible effect.” Throughout history, many would-be conquerors have failed to succeed largely because they did not fully appreciate moral centers of gravity.

In chapter 4 of book eight, Clausewitz cites specific moral centers: “In countries subject to domestic strife, the center of gravity is generally the capital. . . . Among alliances, it lies in

it is unlikely that defeating an operational center of gravity will undermine strategic moral centers

the community of interest, and in popular uprisings it is the personalities of the leaders and public opinion.” But does he mean “the center of gravity is generally the capital” or what is in the capital? He concludes that capturing the capital would be “important for the defeat of the enemy. . . if it is not only the center of administration but also that of social, professional, and political activity.” Who is governing

and conducting political and economic activities? Moreover, the Graham edition reads, “this centre generally lies in the capital.” *Lies in* is quite different than *is the*. Is it actually “the community of interest?” Both the Graham and the Howard and Paret translations render “lies” in the community of interest. But who determines that interest over the duration of a conflict? On popular uprisings, the Graham translation states that center of gravity resides “in the person of the chief leader, and in public opinion.” What if the public is apathetic? Is it still a center of gravity? A strong-willed population is a source of moral strength and, conversely, a weak-willed one is a critical vulnerability.

To reach a lasting settlement—self-sustaining peace—one must undermine enemy strategic, and especially moral, centers of gravity. There must be clear linkage between campaign objectives on the operational level and undermining moral centers of gravity (or resistance) on the strategic. That takes more than the military instrument; the total strategy should embrace every instrument of national power—military and nonmilitary. If operations stand alone, it is unlikely that defeating an operational center of gravity will undermine strategic moral centers of gravity.

The outcome of the Persian Gulf War was a resounding victory that achieved the limited objective of the Coalition, liberating Kuwait, by defeating the Iraqi operational center of

gravity, the Republican Guard. But Saddam Hussein, a strategic moral center, remained undefeated. In Operation Iraqi Freedom, Saddam was effectively neutralized early in the war, and the information operation undermined popular will (another potential strategic center) to fight on his behalf. Thus the moral centers of gravity were neutralized simultaneously with defeating operational centers of gravity, the Republican Guard and the *Fedayeen*. The Coalition achieved operational objectives, seizing Baghdad and toppling the regime. However, neutralizing a strategic center of gravity is not the same as defeating it, which is necessary for the wider strategic objective of lasting peace. The evolving nature of the conflict in Iraq demonstrates that continuing effort is required to win over the will of the Iraqi people to accept Coalition strategic postwar objectives.

How does one identify moral centers of gravity? The process begins and ends with people, for only they can create and sustain moral resistance. People fall into the following categories.

Leaders have the will to develop, execute, and sustain a policy of opposition to an enemy as well as the ability to exert that will through the military and people (examples include Saddam Hussein in 1990–91, Winston Churchill in 1940–41, and Joseph Stalin in World War II).

Ruling elites are closed groups in which real power resides in their members, who are loosely described as kingmakers, and who direct policy and wield control over the military and people (examples are the Soviet Politburo in the 1970s and clerics in the 1979 Iranian revolution).

Strong-willed populations are large groups with common beliefs that compel them to engage in conflict (examples include the Palestinians and Israelis in their dispute over the Occupied Territories and Americans in the wake of the Japanese attack on Pearl Harbor).

Two central elements common to these moral centers of gravity are the will to fight and the ability to command the necessary resources.

1st Marine Division Combat Camera (Kevin C. O'Neil, Jr.)

According to Clausewitz, “The first, the supreme, the most far-reaching act of judgment that the statesman and commander have to make is to establish . . . the kind of war on which they are embarking. . . . This is the first of all strategic questions and the most comprehensive.” They must therefore first appraise the moral and physical character of an enemy to include its moral and physical centers of gravity. There is no alternative, short cut, or analytical model to make up for inaccurate assessment of the enemy when deciding on centers of gravity.

Defeating a leader differs from undermining popular will. In Afghanistan, for instance, planners could have considered several moral centers of gravity: Mullah Omar, the Taliban elite, or large segments of the Pashtun population. The right choice assumed in-depth knowledge of the Taliban and the local situation, and a wrong one would likely have led to a misdirected campaign.

By appealing to the original concept of centers of gravity, one can determine that they are dynamic, positive,

active agents (people in formations and groups or individuals), obvious (more for physical than moral centers, depending on the quality of intelligence gathered on an enemy), and powerful and strike effective blows. Physical centers of gravity can be visualized more easily as armies or units, those things that resist an enemy. By contrast, moral centers of gravity are less obvious. Yet it is essential to understand them since they are likely to be more important on the strategic level.

Clausewitzian centers of gravity are not characteristics, capabilities, or locations. They are dynamic and powerful physical and moral agents of action or influence with certain qualities and capabilities that derive their benefit from a given location or terrain. Further analysis is required to clearly define the relationship between centers of gravity and critical vulnerabilities, thus enabling planners to better focus sources of power on developing successful strategies and campaigns. This process will indicate where characteristics, capabilities, and locations properly belong in the overall scheme of things when thinking about warfighting. **JFQ**

NOTES

¹ Carl von Clausewitz, *On War*, edited and translated by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), pp. 75, 77.

² *Ibid.*, p. 595.

³ Antulio J. Echevarria II, “Clausewitz’s Center of Gravity: Changing Our Warfighting Doctrine—Again!” (Carlisle Barracks, Pa.: Strategic Studies Institute, U.S. Army War College, September 2002). See especially p. 10.

⁴ Howard and Paret, *On War*, p. 486.

⁵ Carl von Clausewitz, *On War*, translated by J.J. Graham (London: Kegan Paul, Trench, Trübner, 1908), volume I, book six, p. 354.

⁶ Joe [Joseph L.] Strange, *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can All Speak the Same Language*, Perspectives on Warfighting Series, no. 4, 2^d ed. (Quantico, Va.: Marine Corps University, 1996).

⁷ Carl von Clausewitz, *Vom Kriege*, edited by Werner Hahlweg (Bonn: Ferd. Dümmler, 1980), p. 976. He uses the standard meaning of *Schwerpunkt*, which was center of gravity. The military definition as a point of main effort was accepted by the Prussian army. Since Clausewitz appeals to both, accurate translations must depend on the context.

B-2 on ramp, Nellis Air Force Base.



U.S. Strategic Command

509th Communications Squadron (Michael R. Nixon)

Meeting Global Challenges

By JAMES O. ELLIS, JR.

The Nation has faced unprecedented threats over its history that called for a bold strategy. Consider the following statement in the inaugural address of Harry Truman: “Events have brought our American democracy to new influence and new responsibilities. They will test our courage, our devotion to duty, and our concept of liberty.” Those words

reflect the major challenges faced by a commander in chief who worked with Congress to reorganize the Armed Forces and establish new missions demanded by national security. Today civilian leaders are again taking bold steps to introduce changes in military organization because of national security imperatives.

Established in October 2002 to replace Strategic Air Command and U.S. Space Command, U.S. Strategic Command capitalizes on synergy generated by combining command and control of nuclear forces and space-based operations. Subsequently, it received four previously unassigned

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missions: global strike planning and execution; integrating information operations; integrating global ballistic missile defenses; and command, control, communications, computers, intelligence, surveillance, and reconnaissance (C⁴ISR).

Each new mission is strategic in both scope and effect. Full operational capability for this dynamic package will provide a unified resource for better understanding threats as well as a means to respond quickly. Legacy missions impose the rigorous discipline of nuclear responsibilities and creative drive of experience in space. Effective evolutionary strategy runs through these missions as the command gathers and translates real-time data to produce actionable intelligence to enable decisions on a timely basis for joint warfighters.

Global Strike

The first new mission requires rapidly projecting military power against terrorists, hostile states, or any other threat. It depends on synergy achieved by identifying target sets and managing space-based assets for weather and intelligence, surveillance, and reconnaissance mission planning support, global positioning for precision execution and timing, and comprehensive communication systems under the sea, in the air, and in space.

To reclaim the original meaning of the term *strategic* as more than a synonym for nuclear, the capabilities must include conventional weapons

as well as kinetic and nonkinetic alternatives that can be employed to meet various threats in time-critical situations. The promise and

challenge of global strike is producing capabilities that reach across mission areas. Global strike is realigning and repositioning the military to protect the Nation and its allies. The structure and employment of the Armed Forces are changing. Agility is an attribute requiring smaller, more rapidly deployable units. U.S. Strategic Command must be able to support them with a responsive strike capability, which can reach globally in hours or even minutes.

The command is also preserving six decades of nuclear weapons stewardship and its focus on strategic nuclear forces. The triad of bombers, ballistic missile submarines, and intercontinental ballistic missiles is key. The President is committed to reducing operationally deployed warheads to between 1,700 and 2,200 within a decade, and the command is responsible for this task while maintaining national security. Toward this end, it will periodically assess the strategic environment and reductions to ensure that forces are aligned for the future. The command will draw down the

number of Peacekeepers in exchange for the warheads on the older Minuteman III missiles in fiscal year 2006. It is also extending the life of Minuteman III missiles by upgrading both propulsion and guidance systems while exploring future intercontinental ballistic missile concepts.

Information Operations

Analysts often equate information operations with computer networks, but that view does not reflect actual missions. Commanders operate in a multidimensional battlespace that calls for going beyond day-to-day military requirements. In this environment, information operations have an incredible impact through electronic warfare, psychological operations, operations security, and military deception. U.S. Strategic Command seeks to ensure use and trust of friendly information systems while denying some or all of that use and trust to an enemy. Understanding the vital role of information in every segment of society highlights the importance and scope of this mission.

Information operations are rarely defined broadly enough. They can include all instruments of national power and the interagency process. They will not be effective unless integrated across the national security community. Furthermore, information operations are not new. Almost every organization has its own program. The difficulty comes when commanders find themselves in the midst of crises and organize information teams from disparate sources. The command vision has resolved this issue by providing a single integrated source of assets for every commander.

Global Missile Defense

There is a wider range of threats today than during the Cold War. The distinction between national missile defense and theater missile defense no longer exists. The Missile Defense Agency is specifically tasked to develop missile protection for the homeland and allies. The mission of U.S. Strategic Command is turning the focus of warfighters to missile defense and also making the system operational. Initially, the command will integrate disparate missile defense systems in one system and link it to other offensive capabilities. In addition, it must examine technological, organizational, and operational capabilities to integrate and develop a multilayered system to protect the United States and its allies.

Multilayered missile defense involves more than directing missile-on-missile engagements. The emerging defense network will integrate

the distinction between national missile defense and theater missile defense no longer exists

USS Lake Erie
firing SM-3 missile.



U.S. Navy

command and control, attack operations, intelligence, interceptors, and the full spectrum of sensors able to feed information on the terrestrial and space environment to battle management centers that direct interceptors to targets. But there is no system capable of stopping every threat. The solution lies in multiple layers of defense with a number of systems. The initial ground-based missile defense interceptors will be fielded at Fort Greely and Vandenberg Air Force Base. The command is also considering other systems such as Patriot and theater high altitude air defense. In the future, the global

missile defense system is likely to include sea-based interceptors, the airborne laser, and other cutting-edge technology.

Global C⁴ISR

The fourth mission, global command, control, communications, computers, intelligence, surveillance, and reconnaissance, is best understood in terms of its constituent parts. Each element is distinct and raises specific issues. The first goal is developing a command and control structure that provides knowledge superiority, information assurance, timely decisionmaking capabilities, and prioritized resource tasking on a global

Tomahawk missile test at Point Mugu.



scale. This will allow integrating strategic, operational, and tactical levels of command from the President to warfighters. In addition to obvious technical challenges, establishing governance, standards, and policy to ensure the transition to a multilevel, secure, network-centric enterprise remains a primary objective.

U.S. Strategic Command is integrating command and control systems across mission areas and engaging other organizations to identify requirements for consolidated support of warfighters. One example is its collaboration with U.S. Joint Forces Command and the Office of the Assistant Secretary of Defense for Networks and Information Integration to delineate the responsibilities of warfighter command and control. In a parallel effort, the command is working to consolidate and centralize command and control governance, a key to attaining a truly global DOD enterprise.

Lessons from Enduring Freedom and Iraqi Freedom identified requirements for commercial satellite communications, network security, and bandwidth expansion. The command is working with public and private sources to improve the use and protection of these assets. It will remain focused, apply lessons, and address challenges while ensuring that it does not create stovepiped

systems. The ultimate goal will involve cultural change as the command introduces a 24/7 cross-functional information sharing system.

U.S. Central Command had seven times more bandwidth available in Iraqi Freedom than Desert Storm, and four-fifths of that expansion came from commercial systems. Modern systems require increased capabilities. For example, Global Hawk unmanned aerial vehicles can receive commands and transmit high resolution streaming video with up to 1.2 gigabytes of bandwidth per second. By contrast, older manned U-2 aircraft need only 2 megabytes per second. Warships that fire Tomahawk cruise missiles can also be heavy users of satellite communications, especially when relying on space-based systems to obtain targeting information. Bandwidth demands will only increase as more unmanned aerial vehicles are fielded and new weapons are deployed that can be reprogrammed in flight, such as the Tactical Tomahawk.

U.S. Strategic Command is assuming some intelligence, surveillance, and reconnaissance duties from the Joint Staff. These capabilities are seen as a weapons system to enable operations with a deterrent value of their own. As commanders rely on more sophisticated and integrated ISR support, the command must supply unprecedented situational awareness for battlefield dominance.

The command is building on the legacy of U.S. Space Command. Land forces will depend on the next generation of space systems with space-based radar, transformational communications, and space-based infrared and global positioning systems. When integrated, space forces will offer decisionmakers and commanders unprecedented situational awareness, communications, and navigation and timing.

Coordinated application of these capabilities is essential to give the Armed Forces battlefield dominance and enable concepts such as global strike and missile defense. This will require a single source for space-based capabilities that cuts across the military and national space boundary. Strategic Command is uniquely positioned to help plan and support an effort to combine military and national security space operations in support of both peacetime and wartime operations.

Military Culture

A global focus and unique combination of missions require cultural changes. To achieve the vision of the President and the Secretary, U.S. Strategic Command must synchronize its assets toward a single purpose. Its missions are dynamic and must evolve cohesively. Strategic thinking requires breaking down boundaries and surmounting ownership issues. The Nation can no longer

USS Ohio undergoing conversion.



U.S. Navy (Wendy Hallmark)

afford bifurcated operations. Old divisions—civilian and military, joint and service—must give way to a strategic, coordinated, unified approach to serve everyone concerned.

U.S. Strategic Command has Army and Marine Corps components that work closely with their Navy and Air Force counterparts. Joint task force-global network operations and information operations center personnel interact with partners from the National Security Agency and Defense Information Systems Agency. Moreover, foreign colleagues are being added. Britain is on

board, and other allies will join the endeavor in Omaha to work together in unprecedented ways to ensure the security of the free world.

The command must continue to engage a future that not only links across military and national security operations but builds a truly combined system where observing, orienting, and acting are one process, not three.

Enduring Freedom and Iraqi Freedom revealed the potential of cutting across organizational boundaries in space as orbiting capabilities became critical warfighting components. Now the command must change the way it interacts in all mission areas to ensure that warfighters have the

support to access data and conduct effective operations during any conflict. Timely and accurate information has become a decisive advantage in the shadowy global war on terrorism, especially for Special Operations Forces. While these professionals do not ask for accolades, they demand the most up-to-date information.

The Armed Forces are challenged to discover, observe, and target more elusive enemies in the

U.S. Strategic Command will provide a unified resource to better understand threats and rapidly respond to them

72-hour air tasking order cycle and even the 45-minute response time seen in Iraq. While that is a remarkably short kill-chain cycle, it was ten minutes late for one well-publicized strike. The command is

uniquely positioned to help plan and support the dynamic evolution required to further compress this timeline to better hold enemies at risk.

The command will not realize its potential until processes linking it to the common pursuit of national security are addressed. New organizations with old processes are not an answer. It is clear that chains of command must be streamlined and duplication avoided. And it is not an issue of ownership or self-aggrandizing authorities. Rather it is about doing what is right and best for the security needs of the Nation.

Partnerships with civilian agencies, industry, and academe are also vital to all mission areas and to achieving the integrated teamwork essential to success. The command is fortunate in having strong relations with these players, and as it moves forward in each new mission area it will need even stronger ties with all its partners, old and new.

Tradition and Innovation

As it becomes fully operational, U.S. Strategic Command will provide a unified resource to better understand threats and rapidly respond to them. However, achieving such capabilities will require charting a course over the horizon. This effort involves developing a new paradigm that is not understood at present. Consider designers of video games. It can take from 18 to 30 months to make a quality game for personal computers. Work can begin on games before the computer on which they will be played becomes available. And all that effort is for developing games.

The stakes involved in developing and coordinating systems for national security are much higher and need an advanced level of foresight. America has reached a pivotal point in its history. The security environment is changing dramatically.

U.S. Strategic Command is literally new. Its missions confirm that *strategic* should not be equated with *nuclear* but rather defines the range of options available to protect national security. Meanwhile, potential enemies will seek to exploit vulnerabilities on land, at sea, and in the air as well as in information networks and space systems.

The command can build on traditional strengths while shaping its broader and deeper role. To accomplish this goal, its service components must reach outside their own traditions to integrate tasks in new organizational constructs and draw on expertise from across the defense community. At the same time the command relies on the services to provide unique perspectives and distinct contributions. This mix of tradition and innovation has resulted in excellent progress.

There are unprecedented opportunities to shape capabilities to meet the needs of the Nation. Unfortunately they will remain nothing more than opportunities without the courage to seize them, which means consolidation. U.S. Strategic Command must integrate operational concepts as well as streamline chains of command, not just draft memoranda of understanding or organize senior steering groups. Bold innovation must drive efforts to support the new missions assigned. Global threats are too radical for old ideas. The bottom line is not complicated: U.S. Strategic Command must think and act in new ways.

JFQ

Preparing for
Hurricane Isabel.



U.S. Air Force (William M. Flate, Jr.)

The DOD Role in Homeland Security

By ADRIAN A. ERCKENBRACK and AARON SCHOLER

Many experts warned prior to September 11, 2001, that the proliferation of weapons of mass destruction (WMD) would exploit weaknesses in the defense of America. A report by the Commission on National Security/21st Century sounded one such alarm: "The United States will become increasingly vulnerable to hostile attack on the American homeland. . . . military superiority will not entirely protect us." The subsequent terrorist attacks validated the commission report and the need to reexamine protecting the homeland. Moreover, they resulted in a reappraisal of the role of the Department of Defense in support of civil authorities. Among Federal agencies, it has the most experience in combating terrorism.

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One year after 9/11, the commission cochairs, Gary Hart and Warren Rudman, cautioned: "America remains dangerously unprepared to prevent and respond to a catastrophic terrorist attack on U.S. soil." And, as the Nation prepares for such attacks, so will terrorists. Though America maintains a superiority in weaponry, personnel, and other resources, terrorist groups can convert their disadvantage in numbers into an advantage. Networked terrorists can coordinate strategy and plans, execute schemes quickly, and outpace the cumbersome U.S. decisionmaking cycle.

The DOD Role

The establishment of U.S. Northern Command (NORTHCOM) strengthened the capabilities of the Nation to respond to terrorism. The command solidifies the DOD role in homeland defense and provides information to Federal, state, and local authorities. And it could do more by leveraging WMD expertise through planning,

training, exercises, and consequence management to support the homeland defense mission. This is a break with the traditional practice by the defense community of getting involved in domestic consequence management only after events overcome the capacity of civil authorities to respond.

The defense establishment should not be the first responder or lead agency in preventing or detecting terrorism but should assist organizations tasked to respond. It alone has the capacity to both improve homeland security on the Federal, state, and local

existing procedures must be enhanced to coordinate DOD involvement with first responders

levels and respond to chemical, biological, radiological, nuclear, or large explosive events. For the Nation to become more secure as a result of NORTHCOM activities, the conventional homeland defense paradigm of response must give way to a new model that includes both prevention and preparedness.

To date the Secretary of Defense has specifically referred to DOD involvement as homeland *defense* rather than homeland *security*—signifying more than a semantic difference. Defense implies deterrence and/or response whereas security is more comprehensive; defense is part of security but not the only part. This distinction avoids having the Pentagon become embroiled in an ill-defined mission as capstone agency for Federal, state, and local police and first response agencies. The Department of Defense is not prepared, willing, or in some cases constitutionally permitted to play that role. Yet because agencies that must respond to the consequences of an attack using weapons of mass destruction need resources now instead of after another terrorist attack, the DOD mission must be expanded from just defending the homeland to supporting homeland security, especially since a future attack could inflict more casualties than were suffered on 9/11.

Support Planning

A strategic support plan should be developed to meet the challenges of homeland defense and security. While emphasizing defense, it should also be focused on security objectives to support state and local authorities, in some cases with extant defense organizations, resources, and policies. The plan should provide a strategic vision and endstate, be coordinated with both Mexico and Canada, focus NORTHCOM activities by providing clear goals, be linked to the Department of Homeland Security (DHS), and work in partnership with other Federal and state agencies.

Existing procedures must be enhanced and other mechanisms developed to coordinate DOD involvement with first responders. These steps may include:

- making homeland security the primary mission of part of the National Guard
- developing a NORTHCOM civil support structure to parallel the Federal Emergency Management Agency (FEMA) regions and National Guard state area commands (STARCs)
- broadening current policy in DOD Instruction 2000.12 and DOD Directive 2000.16 to require military installations and defense agencies to incorporate first response and consequence management organizations in terrorism planning, exercise, and evaluation activities
- working with the Department of Homeland Security to develop a telecommunications infrastructure to connect selected homeland security agencies
- expanding defense participation on both the Federal and state levels, developing more comprehensive interagency curricula at professional military education institutions, fielding regional chemical biological incident response teams (CBIRTs), and organizing consequence management centers of excellence.

The result must be improved prevention, preparedness, and consequence management on the state and local levels, enhanced interoperability among agencies, common communication and equipment standards among all agencies, and coordinated and synchronous response mechanisms. Such actions do not suggest that the Department of Defense should assume those responsibilities alone or be the lead Federal agency but that it should coordinate with the Department of Homeland Security and supporting organizations.

Strategic Planning

It is essential to develop a plan to defend and secure the homeland. By definition it should include the objectives of the Secretary of Defense for operations needed to meet the requirements of homeland defense and security. Such a plan would guide development of supporting operational and tactical planning and facilitate coordination of strategic priorities and resource allocation on the national level. It must seek to link homeland defense and security goals to NORTHCOM and DHS planning. Absent an overarching plan, the unified commands and services should rely on policies, regulations, and other issuances from organizations with disparate responsibilities and perspectives to safeguard their personnel and facilities as well as assist the civil authorities.

To address the threat of domestic and transnational terrorism, this plan must be national and international in scope. It should integrate homeland defense and security planning with state and local authorities at home as well as



20th Communications Squadron (Josef Cole)

Antiterrorist exercise.

in Mexico and Canada. This approach will address existing shortcomings and provide comprehensive responses to threats such as smallpox, which can spread rapidly beyond boundaries.

The plan must be accompanied by a concept development and experimentation process that will allocate forces and resources and develop both joint and service mission essential task lists. This process will be valuable for the Army and Air National Guard, which are expected to assume responsibilities for homeland defense and supporting security.

Reserve Components

With the decline of the homeland protection role in the last century, the military became increasingly expeditionary, applying its power abroad to deter foreign threats to national interests. Turning back to homeland defense, it is critical for the Armed Forces to maintain their expeditionary character. But securing the Nation is a fundamental mission that the Reserve components must be reorganized, trained, and equipped to accomplish.

The Army and Air National Guard are best suited for a homeland defense and security role. These two Reserve components have deep roots in their local communities. Furthermore, because most state adjutants general also serve as both emergency manager and homeland security director, they are engaged in intragovernmental issues as well as Federal and interagency matters. Operating outside existing arrangements or establishing new organizations that replicate those efforts would add bureaucracy, increase turf battles, and decrease efficiency on the state level.

Homeland defense is not a new mission for the National Guard, but it must be expanded to

include appropriate organizational structures and added resources. In addition, it must plan, train, and conduct exercises with agencies that respond to chemical, biological, radiological, nuclear, or large explosive events. NORTHCOM, working with state adjutants general, should develop a plan to address concept development and validation of homeland defense roles and missions. The plan must also move assets from geographic support to assist in homeland defense and security. While reorienting a portion of the National Guard is a departure from current thinking and operations, it reflects the changing national security environment.

The Quadrennial Defense Review issued in 2001 concluded that defending America was the primary DOD mission and that policy would evolve accordingly. NORTHCOM was designated to provide unity of command for this mission, but there are significant problems because capabilities intended to defend the homeland and support civil authorities were developed for fighting overseas. Thus the command must first be configured to better leverage existing organizational structures.

Command Restructuring

Central to the success of U.S. Northern Command in providing timely, appropriate support to civil authorities is the development of a command and control structure that reaches *down* to state level while reaching *out* to other Federal agencies. The purpose of this structure is not to exercise command and control as lead agency but to facilitate coordination. NORTHCOM can leverage several organizations. One is the Federal Emergency Management Agency, which deals with consequence management through ten regional offices covering most of the NORTHCOM area of responsibility. Within those regions, STARCs can be tasked and organized to help oversee training regimes and standardize requirements, develop common terminology, and synchronize the efforts of state and local first responders—a million firefighters, half a million local police, and 150,000 emergency medical workers. In addition, there are numerous active duty service installations in each of these FEMA regions and STARCs that currently conduct antiterrorism planning, training, exercises, and evaluations. It is imperative that the National Guard and first responders take part in all critical planning, training, and evaluation in their locales. This would often incur no extra funding, but it would require thinking differently. By looking beyond the perimeter of the installation and the

USCGC Bainbridge in New York harbor.



U.S. Coast Guard (Tom Spurduto)

military as a whole and by incorporating the efforts and resources of many agencies into plans, exercises, and evaluations, the Department of Defense can significantly improve first responder capabilities. This will decrease the likelihood that the department will have to provide first response to a local incident.

Policy and Directives

DOD Directive 2000.12 establishes responsibilities for antiterrorism/force protection while DOD Instruction 2000.16 sets antiterrorism standards. Both issuances apply to physical security for activities overseas and at home, but their scope must be expanded to include Federal, state, and local agencies in antiterrorism planning, training, and exercises. Extending these authorities across the Department of Defense will be a major step in improving interoperability and capabilities.

Moreover, many commanders are unaware of their responsibilities to respond to civilian requests for emergency assistance based on DOD Directive 3025.15, "Military Assistance to Civil Authorities." The Secretary of Defense retains approval authority for support to civil authorities involving the use of commander-assigned forces, which would include any personnel or assets that might be used in a chemical, biological, radiological, nuclear, or large explosive event in the United States. This issuance gives commanders

immediate emergency response authority to save lives, prevent human suffering, or mitigate property damage under imminently serious conditions. Commanders who receive verbal requests from civil authorities during an exigent emergency may initiate informal planning and immediately respond under the directive. This information should be incorporated in professional military education, starting with courses for junior officers, and also disseminated to civil authorities on all levels.

Once NORTHCOM has broadened its antiterrorism policy to include functional prevention and preparedness activities that are paired with an organizational structure designed to best support civil authorities, it must communicate its changed regulations and standing directives to all Federal, state, and local homeland security agencies.

Connecting the Dots

While first responders must be integral to network-centric warfare, the current state of play suggests that is not the case. One way to rectify this situation is the better use of the defense message system, a telecommunications capability based on off-the-shelf commercial products.

The system can provide secure, accountable, reliable writer-to-reader electronic messaging for

both institutional and individual users. It replaced AUTODIN as well as other disparate e-mail systems within the Department of Defense. The user-friendly X.400-based messaging system, which resembles a common e-mail application, handles classified information with high-assurance message security and delivery capability. The defense message system also provides global X.500 directory services and supports transmission of digital files containing graphics, photo imagery, and video. The system has been designed to use interoperable commercial hardware and software.

Another option is supporting the effort by the National Guard Bureau to optimize GuardNet for homeland defense and security. Although not

NORTHCOM must also help open interagency communication pipelines and develop manning for liaison elements

as capable as the defense message system, it was useful for limited long-distance communications on 9/11 when phone lines became unavailable. Regardless of which system is selected, it must enable numerous Federal, state, and local agencies to exchange information, and it must serve as an alternate secure means of communication during a crisis. NORTHCOM must also help open interagency communication pipelines and develop manning for liaison elements within selected Federal and state agencies.

Expanding the Mission

The Department of Defense lacks domestic WMD prevention or consequence management interoperability to deal with a real asymmetric threat. Accordingly, it must expand its interagency role through education, exercises, and training. To foster interoperability, cooperation, and jointness, the defense presence in the interagency process could be increased by assigning more personnel to liaison offices in FEMA regions. Emergency preparedness liaison offices assist in planning and coordination with state authorities, local jurisdictions, and integrated training and exercises. Coordination should not be limited to consequence management but should include prevention and preparedness activities with Federal, state, and local agencies. Members of both the active and Reserve components should staff these liaison elements. To expand the number and type of National Guard personnel in full-time positions may require a change in the authority for Federally financed, state-controlled National Guard activities.

Another way to foster interagency coordination involves providing the same type of DOD liaison to the Federal Bureau of Investigation, which is responsible for antiterrorist crisis management. Finally, liaison officers could be assigned to state emergency operations centers. Terrorists are most likely to target infrastructure to overwhelm preemption and consequence management capacities. Such an attack may be designed to provoke Federal, state, and local responses simultaneously. The Department of Defense must be prepared on every level (its first responders will be on the installation level) to participate in a joint interagency task force made up of multiple Federal, state, and local agencies. Training for such events can occur in both military schools and installations across the country or at National Guard training centers—existing assets that can be economically expanded to support realistic interagency planning, training, and exercising with first responders, law enforcement agencies, active duty personnel, and all levels of government. Optimally, the Department of Defense must develop this capability until it becomes second nature to both the installation force protection officer and the joint staff officer in any organization. A special focus of any expansion of the defense role in the interagency process must be the knowledge of actions to be taken in a chemical or biological environment.

A natural adjunct to DOD efforts would be a training academy under the Department of Homeland Security for first responders and continuing education of officials in appropriate agencies and organizations.

A Chemical/Biological Initiative

One key assumption about a catastrophic terrorist attack is that defense and response begin on the local level and that sufficient Federal and state assistance will not arrive for hours or days. Given current assets, state and local law enforcement, emergency response, and medical services may collapse quickly. The Department of Defense can decrease the time required to identify, react, and contain a chemical or biological attack, provide a multilayered national crisis response capability, and decrease the scope and length of any commitment. Any such initiative must:

- develop and integrate disease diagnosis and reporting with the Centers for Disease Control and Prevention (CDC)
- create CBIRTs to improve the national chemical and biological response capability and create consequence management centers of excellence
- broaden participation of Federal, state, and local prevention, preparedness, and consequence management under the revised emergency management standard of the Joint Commission on Accreditation of Healthcare Organizations

F-16 patrolling American skies, Noble Eagle.



1st Combat Camera Squadron (Aaron D. Almon II)

- help implement a laboratory response network for bioterrorism
- review and recommend changes to Federal, state, and local contingency plans to integrate installations, facilities, and personnel in the movement, security, and distribution of national pharmaceutical stockpile packages.

Detection and Warning

For the Department of Defense to help civil authorities identify and contain the spread of any contagion, it must improve its disease surveillance detection systems and the way it communicates indication and warning of pending attack, confirmation of an attack in progress, and details of a past attack to partners. Currently, sources of data for both defense and public health surveillance are as varied as the diseases and conditions themselves. Because there are multiple data sources, information requirements, distinct users, and private and governmental partners with whom the Department of Defense may collaborate in obtaining data for specific program areas, there is no single syndromic surveillance system that captures information required to monitor the health of DOD personnel and share it with the Centers for Disease Control.

To meet this need, the defense community must be integrated into the national electronic disease surveillance system or something like the health alert network or a parallel system. When completed, the system will electronically link a

variety of syndromic surveillance activities and facilitate more accurate and timely reporting of disease information to the Centers for Disease Control. It will include data standards, an Internet-based communications infrastructure built on industry standards, and agreements on data access and sharing, burden reduction, and confidentiality. This type of system would provide information crucial to monitoring the health of DOD personnel, identify their health problems and priorities, help the department take actions to prevent further illness, assist in evaluating the actions, and serve as a collaborative means of monitoring syndromic trends in other parts of the country.

Consequence Management

The concept for chemical biological incident response teams grew out of the chemical biological incident response force (CBIRF), formed in 1996 in response to Presidential Decision Directive 39. The Marine Corps organized this self-contained unit of 375 marines and sailors that can counter chemical/biological terrorist threats.

When directed, this force can rapidly respond to chemical or biological threats. Once deployed, it coordinates initial relief efforts, security, detection, identification, expert medical

USNS Comfort
in New York harbor,
September 18, 2001.



U.S. Navy (Aaron Peterson)

advice, and limited decontamination of personnel and equipment. Although this unit can perform its primary missions, the scale of a potential biological terrorist attack has expanded the scope of the required response.

The level of response being considered must be able to deal with a threat similar in size and scope to that portrayed in the biological terrorism exercise, Dark Winter. In that scenario, the effects of a terrorist attack using smallpox encompassed

a multistate region and rapidly overwhelmed the Federal, state, and local consequence management response. Under this scenario, CBIRF would respond with critical resources as needed, but its

capabilities in security, detection, identification, expert medical advice, and limited decontamination would be quickly overwhelmed. Indeed, even multiple units would be insufficient to manage a terrorist attack like the one in the exercise.

Part of the solution is lending DOD expertise to planning, training, exercises, detection, and medical operations in a contaminated environment and providing WMD response and management capabilities alongside Federal, state, and

local agencies with first response missions and requirements. In effect, although no single organization would be responsible for responding to an event on the scale of Dark Winter, contributing such expertise will improve the capability to prevent an incident from reaching a supercritical magnitude, while decreasing the probability that the Department of Defense will be required to respond in the first instance.

To achieve this objective, the best option would be embedding a more capable prevention, detection, and consequence management capacity in the National Guard. It must develop chemical biological incident response teams, determine their appropriate size and equipment, and provide transport for five or six strategically located regional teams, each within four hours flying time of any point in its area of responsibility. That would enhance the capability to respond to bioterrorism incidents that overwhelm first responders. Moreover, developing and pre-positioning teams in selected locales would offer a layered response (no mid-sized WMD consequence management assets exist between state and local HAZMAT units and strategic CBIRF assets). This would also reduce the distance over which response forces must travel in an emergency.

the best option would be embedding a more capable consequence management capacity in the National Guard

The response force would provide regional consequence management centers of excellence. On a day-to-day basis teams would form centers to provide consequence management planning, training, evaluation, and exercises. They would also serve as catalysts by developing standards for equipment, communications, and doctrine among first responders. This phenomenon is occurring already, albeit on a lower level and smaller scale, wherever WMD civil support teams are present. While not originally envisioned as a DOD mission, a collateral benefit of civil support has been offering a credible and neutral catalyst in an environment that is often turf oriented. On a larger scale, while CBIRTs have not previously existed, there is precedent for providing such assistance to Federal, state, and local agencies.

The National Defense Authorization Act of 1997 required the development of a program to test and improve responses to emergencies involving biological and chemical weapons. To enable this program, Federal funding must support National Guard CBIRTs, including planning, training, evaluation, and exercise oversight to state and local organizations.

Medical Support

To respond to the threat of bioterrorism, plans should be developed to increase the capacity of the Laboratory Response Network. The Department of Defense could contribute by enlarging the number of level-four labs and connecting them with Federal information systems to improve rapid diagnostics and report attacks. Such capabilities are located at the U.S. Army Medical Research Institute of Infectious Disease at Fort Dietrich, Centers for Disease Control in Atlanta, Southwest Foundation in San Antonio, and National Institutes of Health in Bethesda. To decrease the time required for a sample from a suspected terrorist attack to be positively identified, the Department of Defense and Centers for Disease Control must improve existing facilities on the west coast such as the Madigan Army Medical Facility at Fort Lewis and in the midwest or develop new capabilities. If population density is a factor, then the demographics of California, Texas, and Oregon demand that level-four laboratories be located in these regions as well.

By locating more facilities in key areas, the Departments of Defense and Health and Human Services will bolster the number of qualified epidemiological experts, reduce the lag time between discovering and identifying an agent, enhance communicating diagnostic information, and improve the probability of containing a biological attack before it becomes pandemic.

To ameliorate the consequences of nerve agents, biological pathogens, or chemical agents,


the CDC national strategic stockpile ensures the availability of vital pharmaceuticals, antidotes, and other medical supplies and equipment. The program can rapidly deploy resources to any domestic location in the event of an attack involving biological or chemical agents. As part of its response, the Centers for Disease Control would transfer stockpile resources to state or local authorities who, in turn, would repackage medicines and other commodities. This stockpile program was exercised in response to 9/11 when officials in New York requested large amounts of medical material and logistic support. With the support of state and local public health and emergency response agencies, the operation was performed successfully according to contingency plans.

The deployment of the stockpile package in response to 9/11 occurred in a relatively benign environment that facilitated its rapid and efficient transfer to the New York metropolitan area. Had the attack been coordinated with the release of chemical or biological agents—which can spread rapidly and contaminate or infect large numbers of people—and had terrorists interdicted or destroyed the package to increase mortality, the outcome might have been different.

With the arrival of a stockpile package, few law enforcement agencies would be capable of maintaining public order long enough to distribute vaccines under chaotic conditions. Ultimately, the Departments of Defense and Homeland Security must jointly recommend appropriate changes in contingency planning to integrate military assets into the distribution of stockpile packages.

The Department of Defense is not yet prepared to address the consequences of events that employ weapons of mass destruction or asymmetric attacks with conventional means. Detection and containment capabilities are limited in this area. Integrated planning, training, exercises, and evaluation have been discussed but not fully implemented. Most importantly, there is no common understanding of the relationship among prevention, preparation, and response. To overcome the ambiguities in its mission, the defense community must be able to immediately respond in support of Federal, state, and local authorities. It should expand its policy on antiterrorism by leveraging expertise in WMD to prevent any future act of terrorism. By so doing, it can protect the Nation and manage the consequences of an asymmetric terrorist attack.

JFQ

A photograph showing a group of Marines in yellow fire-resistant gear and helmets working in a forest. They are using tools like chainsaws and axes to clear a path or manage a fire. The scene is filled with tall trees and some smoke or steam in the air.

Disengaging from Consequence

Marines fighting fires
in Salmon, Idaho.

2nd Marine Division Combat Camera (Tyler J. Melke)

Management

By JOEL D. CUSKER, CHARLES H. HASH, MARY E. LANDRY, and
DALLAS D. OWENS

Almost twenty years ago, Caspar Weinberger defined the uses of military power in remarks made before a luncheon meeting at the National Press Club. The Secretary of Defense outlined six conditions to be met before committing troops overseas. They required that any decision that put the Armed Forces in harm's way must be based on vital national interests, a clear determination to win, well-defined political and military

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objectives, a continuing reassessment of the relationship between force structure and objectives, a reasonable assurance of popular support, and the appeal to the use of force only as a last resort.

One does not have to be a fan of the so-called Weinberger doctrine to appreciate the benefit of ending military operations in a timely and decisive manner. Leaders value planning that enables disengaging from one operation and deploying to another. And the same capability is valued in domestic assistance. Indeed, it is notable that the current Secretary of Defense, Donald Rumsfeld, has registered his reluctance to commit military assets to aid civilian authorities without a clear exit strategy. Although planning is a scarce commodity during the early stages of such operations, part of the process should be dedicated to exit planning as well as engagement planning.

First responders at McGuire Air Force Base.



305th Communications Squadron (Scott H. Spitzer)

Like disengaging from overseas commitments, exiting domestic missions is not exclusively a military decision. But while the Armed Forces are supporting partners, they need not be passive. Active interagency partnerships are essential in creating an effective disengagement strategy.

Exit Strategies

In a high-end assistance requirement such as consequence management involving weapons of mass destruction, responding is the first priority.

if the military stays longer than required it violates the spirit of the Federal response plan

However, exit strategies are also essential in three ways: ensuring that military support is available for other domestic or foreign emergencies, enhancing return to normalcy in the disaster area, and maintaining civil-military relations.

First, active or Reserve assets responding to events involving weapons of mass destruction will likely come from a variety of units, some dedicated to consequence management, some with expertise in responding to weapons of mass destruction as a primary mission, and many with dual or no explicit missions in this area. If units involved in such a mission are required elsewhere, it will take time to disengage, reconstitute,

and move on. Accordingly, operations are well served by plans that enable quick partial or total disengagement for redeployment.

Next, the goal of Federal agencies in the response plan is assisting overwhelmed state and local governments. Ideally, military support ends as a community returns to normal, perhaps with state help, and is able to perform emergency services needed to save lives, protect property, and transition to recovery operations. If the military stays longer than required it violates the spirit of the Federal response plan, the letter of agreement among participating agencies, and assumptions that justify assistance to state and local governments. It can also hamper the return to normalcy, thereby doing a disservice to the people targeted for assistance.

Finally, effective civil-military efforts depend on forthright relationships among civilian and military agencies. State and local authorities must understand what the U.S. Government can do, including the limits on military assistance. Exit planning can deflect false expectations among state and local officials and the general population on the quality, magnitude, and duration of assistance. No one, especially citizens in supported areas, should be surprised when the military decreases and then ends support. A timely exit avoids competition between business and government agencies. In addition, particularly for the military, staying too long can risk



305th Communications Squadron (Scott H. Spitzer)

Disaster control group, September 2001.

works and engineering (function 3) and as support agency for other functions. The plan addresses only those disengaging Federal agencies responsible for managing assistance to state and local agencies. Disengagement naturally focuses on completing emergency support requirements and releasing agencies with primary responsibility for coordination of that function.

The plan designates a lead organization, normally the Federal Emergency Management Agency (FEMA), and a Federal coordinating officer, the senior official in charge of support. This officer, normally selected from a pool of designated, trained, and experienced officials, has responsibility for disengaging the Federal agencies called on to support an event. Now part of the Department of Homeland Security, FEMA is likely to remain responsible for providing Federal coordinating officers to execute consequence management.

The life cycle of a consequence management event is largely responsible for the dual role of the Department of Defense. Early in an incident, a fast and massive response is necessary across several emergency support functions. Primary agencies may exhaust their organic assets or more likely cannot mobilize or contract for resources to respond quickly and thus will call on the military to meet some or all of the requirements. Concurrently, the military must provide its own support. Logically, a disengagement strategy should return responsibility for emergency support functions to the primary Federal agency or complete the requirement, whichever occurs first. This transition becomes complex when eleven functions are supported, each at different stages of completion or transition to a primary agency.

Determining the status of a function requires coordination among at least three parties: the Federal coordinating officer, primary agency, and defense coordinating officer. Large operations may require establishing a joint task force, but the defense coordinator would remain the point of contact for the Federal coordinating officer. It is reasonable to expect, depending on the magnitude of the event and local capabilities, that this initial supporting effort for the eleven emergency support functions will be a sizable requirement that the Department of Defense is anxious to end. Yet it is during this phase that the military contribution is unique, because no other agency can mobilize the requisite assets as quickly or efficiently.

The follow-on disengagement is obviously secondary to providing immediate emergency services. Assistance for public works and engineering (function 3) comes from the Army Corps of Engineers as lead agency. In support of other functions, the Department of Defense relies on units with specialized or general support equipment.

resentment, constitutional issues, and violations of civil liberties.

Contributions and ownership must be shared by all parties for an exit plan to be effective. In consequence management, the military plan must be integral to the overall Federal engagement and disengagement strategy, which in turn is linked to the request for assistance by state and local governments. The engagement strategy is embodied in the Federal response plan. The Department of Defense has clearly defined responsibilities. In large and complex operations, its role is more critical as a supporter of other agencies. The primary and support responsibilities dictate dual exit strategies, each with peculiar inter-agency relationships.

Federal Response

The process and structure for delivering assistance to address major disasters are contained in the Federal response plan, which designates primary and support responsibilities of emergency agencies and functions. The Department of Defense serves as the primary agency for public

Observation base,
Afghanistan.



55th Signal Company (Milton H. Robinson)

Sometimes unskilled personnel are needed, but at other occasions a few technicians are adequate. In all cases, the defense coordinator remains the single DOD point of contact and requests appropriate military personnel and equipment.

In recent years the disaster life cycle has become fairly predictable for types and magnitudes of events. According to an experienced coordinating officer, and confirmed by recent consequence

management efforts, the emergency response stage with heaviest defense commitments should last no more than 90 days. Disasters could be greater in magnitude and less predictable than events in

the past. But after three months other Federal agencies generally have time to organize, contract, and begin recovery rather than simply managing consequences. Defense contributions in recovery operations are few and are rejected as a consequence management mission. Function 3 activities are likely to last longer, but their level is generally low and routine for the Corps of Engineers.

State and local agencies may have plans, or at least expectations, on how and when Federal agencies disengage. But after submitting requests

for Federal assistance, the plans do not directly affect disengagement; rather requests become part of the initial input to the Federal disengagement plan. Authorities give input to the Federal coordinating officer in many forms, including amended requests. All input is an important source of information for disengagement criteria and plans.

Current Strategies

The Federal response plan is not intended to provide details of disengagement for agencies and components of the U.S. Government. Because the Department of Defense is one of several support agencies, its disengagement is only partially self-determined and depends largely on state and local requests and taskings by the lead agency, under the direction of the Federal coordinator, directly or through another agency. It has developed a number of documents that provide guidance for affecting how that support should be provided and ended.

At the highest levels, there is concern over disengagement because it is situation-dependent. The Pentagon does not publish a plan for disengaging from the consequence management of events involving weapons of mass destruction, but related issues are addressed in DOD Directive 3025.1, which provides the response structure, agency relationships, transition strategies, and leadership responsibilities. This directive clarifies

the Federal response plan is not intended to provide details of disengagement for agencies of the U.S. Government

Battling blaze,
Barksdale Air
Force Base.



U.S. Air Force (Robert Hortsman)

disengagement planning and gives the Federal coordinator overall responsibility for operational phases, including disengagement. Similarly, the Office of the Secretary of Defense or its executive agent—with the Joint Staff, U.S. Northern Command, and Directorate of Military Support on the Army Staff (a function that is being transferred to the Joint Staff)—will appoint a defense coordinator as part of the requirement for defense assistance. Under the Federal coordinator, this officer will orchestrate disengagement based on original and amended requests for assistance.

If the Joint Task Force-Civil Support (JTF-CS) has command responsibility, the defense coordinator may be under its operational control, but this still implements disengagement. Recent initiatives, such as the appointment of the Assistant Secretary of Defense for Homeland Defense and establishment of U.S. Northern Command, may lead to a dramatic reorganization, though one theme seems immune from change: the Federal coordinator must continue to be provided with a single DOD point of contact. It does not matter to which agency the coordinating officer belongs as long as he represents the Pentagon with one voice.

Joint Publication 3-07.7, *Doctrine for Civil Support*, has been a work in progress for several years, but the recent structural and conceptual

changes have outpaced the publication cycle. The most recent draft contains a single paragraph on termination under planning considerations and notes that “termination of military support . . . is a sensitive phase that requires detailed planning” and that the agreed endstate defines when forces will be disengaged. The endstate is unlikely to be determined until the danger recedes and critical services are restored. It will be evident when local authorities are able to assume responsibility for the operation and, together with FEMA, consider the incident under control. This publication contends that disengagement criteria have an objective (capabilities) basis while recognizing the value of political consensus (subjective) basis.

The implementation plan reiterates that successful disengagement and the transition to civil authority are key to the JTF-CS mission and requires detailed planning and execution. It also states that the task force will not remain to conduct recovery operations, defined as long-term cleanup and relief efforts that are the responsibility of local and state authorities. The plan also recognizes the importance of identifying the endstate criteria for disengagement. The endstate should be based on agreements between the lead agency and combatant command before assigning forces. All parties must agree that local authorities can assume operational responsibility before Joint Task Force-Consequence Management will redeploy.

Aeromedical
evacuation,
Hurricane Lili.



2nd Communications Squadron (Laura Smith)

The first JTF commander stated that disengagement is important but likely to be difficult. He also outlined a disengagement policy: begin developing a strategy as soon as the joint task force gets a tasking for civil support. In general, the criteria will call for creating a stabilized environment—moving from crisis to routine responses to requests for assistance. This process involves determining that civilian agencies can perform their functions. More specific criteria will be established to fit the event. He noted that “We will look to FEMA to be our advocate for disengagement.”¹

The *Domestic Operational Law Handbook* offers pragmatic rather than legal advice.² Like other sources, it recommends establishing endstates to mark the completion of disaster assistance missions and understand community objectives. Elaborating on endstates the handbook indicates that they must be attainable, developed from the national to the lowest level, and offer a road map to follow. Perhaps as important, it states that “the affected population must know when military operations will cease and local support organizations are to continue the mission.”

The handbook also recommends that termination standards quickly be set that are objective, measurable, and understood by all players. They

may be “expressed in terms of percentage of pre-disaster capability by specific function; for example, 70 percent of electrical power restored.” The standard should represent the threshold by which the community agrees to have services restored to an acceptable level that can be sustained without Federal assistance.

Response Context

The Federal coordinating officer ultimately makes decisions on disengagement. The issue is ensuring that he has the understanding, motivation, and means to plan the effort. Understanding has been discussed, and FEMA has the mission to meet this requirement. Motivation prior to the event is found in the Federal response plan, which serves as the mission statement for coordinating officers, the urgency of being prepared to perform on short notice, and the responsibility derived from being the steward of scarce lifesaving emergency response assets. After the event, it is found in the specific requests for assistance, the mandate to return the communities to normalcy, and the need to manage the demands from local and state agencies and services provided by a mix of public and private agencies.

The means for planning exist in the numerous teams, groups, and officials that assist the coordinating officer.

- The catastrophic disaster response group is composed of representatives from all Federal agencies and operates on the national level to provide guidance and policy direction on response coordination and operational issues arising from Federal coordinating officer and emergency support functions response activities. It is normally located at FEMA headquarters.

- The disaster field office is the primary venue in affected states for coordinating response and for coordinating officers to collocate, along with Federal agency regional representatives and state and local liaison officers.

- The emergency response team is the principal interagency group supporting the Federal coordinating officer in the overall operation, located at the disaster field office.

- The Federal coordinating officer information and planning section collects, processes, analyzes, and disseminates information to support planning and decisionmaking on both the field and headquarters levels. It has a large section from the emergency response team and a smaller one from the emergency support team at the FEMA emergency information and coordination center.

All four assets are vital for Federal coordination, with information and planning being the logical lead agent for the exit strategy. This section is located on the national and local levels and has contact with interagency representatives, including the local defense coordinating officer.

They also have access to state and local responders and sources of information about recovery needs and activities, are collocated in the operations section of

the Federal coordinating office, and normally are in continual contact with the defense operations section. The information and planning section needs training to maximize its value for disengagement planning.

Effective Strategy

Generally leaders understand the importance of disengagement and developing a strategy. Doctrinal documents on each level note the significance and sensitivity of disengagement. Doctrine treats it on the functional level, as if the department was the lead in performing emergency support functions rather than providing support. That approach neglects the duality of responsibility and results in disengagement criteria focused on only fulfilling functions; it oversees disengagement by handing off to other agencies. Fulfilling these functions is a worst case approach and has merit if functions are performed before lead agencies prepare to handoff.

But planning for only the worst case may overlook an opportunity to disengage quickly, at least partially. Handoff also enables other agencies to fulfill their responsibilities and supports the intent of the Federal response plan.

Both Federal and defense coordinating officers are essential in maximizing disengagement strategies. If they recognize the duality of defense consequence management missions, they can plan to disengage by handoff or functional completion. That recognition will make handoff more likely by highlighting the responsibilities of other agencies and supporting a characterization of the DOD role as a notional ready reserve but not as the force provider of first resort.³

Coordinators are more likely to recognize the dual DOD mission when it is emphasized in doctrinal and training publications. The key documents need to be revised to increase emphasis on disengagement and expand strategies to include disengagement by handoff.

Revising documents is only the first step; training is equally important. But formal training for defense coordinating officers consists of a two-week overview supplemented by the continental army where they command the training support brigade. Exercises reinforce training. Both types of disengagement strategy should ideally be part of this process. They provide the opportunity for interagency players to understand the complexity of negotiating disengagement.

Most importantly, FEMA, with support from other agencies and its parent organization, the Department of Homeland Security, should define disengagement criteria under the response plan. Provisions should be made to ensure that the lead agency establishes a disengagement planning cell with governmental and nongovernmental agencies that have stakes in consequence management. Without the emphasis of the lead Federal agency and coordinating officer, subordinate agencies can do little for a successful transition. Planning cell guidance should establish measurable standards for disengagement, monitor and measure progress toward meeting the standards, adjust standards based on changes to requests for assistance, and inform all parties of the standards and timetable for decreasing and ending support.

The Department of Defense should follow the lead of the response plan by ensuring that it can fully support the disengagement cell. Joint Task Force-Consequence Management should take the doctrinal lead by expanding its implementation plan and ensuring that the final Joint Pub 3-07.7 has an expanded disengagement strategy.

leaders understand the importance of disengagement and developing a strategy



DOD (R.D. Ward)

Ground Zero.

The establishment of the Department of Homeland Security provides an additional forum for policy level interaction among Federal agencies and other parties. The Department of Defense has representation on all levels of homeland security committee work. It is imperative that this new structure address policy issues but recognize that current relationships for executing consequence management are working well, especially between Federal and defense coordinators. Care should be taken to strengthen this cornerstone of effective interagency cooperation.

It is important to exercise disengagement. Without practice, state and local leaders are not likely to trust the process or be prepared to support disengagement planning. And without trust in the process, they are less apt to establish disengagement criteria or reach consensus on schedules. If local leaders are confident that the public and private sectors can resume support functions, they will be more inclined to accept the departure

of Federal agencies. Exercising disengagement fulfills consequence management and demonstrates that a community can both respond to a disaster and then return to functioning normally. **JFQ**

This article is based on a paper written by the authors while attending the Kennedy School of Government at Harvard University.

NOTES

¹ Interview with Brigadier General Bruce Lawlor, February 8, 2000, Washington.

² Peter Menk and Marsha Mills, *Domestic Operations Law Handbook* (Charlottesville, Va.: Center for Law and Military Operations, U.S. Army Office of the Judge Advocate General, 1999).

³ Bradley Graham and Bill Miller, "Pentagon Debates Homeland Defense Roles," *The Washington Post* (February 11, 2002), p. 6.



Northrop Grumman

Charting New Seas

Navy-Coast Guard Cooperation

By CHARLES S. HAMILTON II *and* PATRICK M. STILLMAN

The Navy and Coast Guard have a tradition of collaboration that goes back more than two centuries to their origins as sea services. Faced with an unprecedented threat after 9/11, they have made major strides in force recapitalization and transformation. This relationship was forged in the *National Fleet Policy Statement* in 1998. The Chief of Naval Operations, Admiral Vernon Clark, and the Commandant of the Coast Guard, Admiral

Thomas Collins, have updated this policy to synchronize multimission platforms, infrastructure, and personnel to gain the highest level of naval and maritime capability.

The Coast Guard postponed decommissioning 13 coastal patrol ships and offered them with crews for homeland security missions in ports, harbors, and coastal areas. The two services also met to align homeland security, defense roles, and other responsibilities. This collaboration has improved global intelligence by the establishment of an all-force maritime tracking operation. For example, working with the Coast Guard, the Navy is developing a global intelligence picture to track ship movements at sea, which Clark believes shows profound results.

Rear Admiral Charles S. Hamilton II, USN, serves as deputy program executive officer for ships and formerly commanded USS O'Brien; Rear Admiral Patrick M. Stillman, USCG, is program executive officer of the integrated deepwater system acquisition and formerly commanded the barque Eagle.

Beyond operational cooperation, both services are seeking greater overall collaboration in the future. They signed a memorandum of understanding in 2002 and established a working group to identify common elements in developing the national security cutter, offshore patrol cutter, and other platforms for the integrated deepwater system (IDS) and the littoral combat ship (LCS).

The Navy contribution to this effort is envisioned as a small, fast, agile, and networked warship optimized for a variety of littoral missions. It is key to next-generation surface combatants that include the multimission destroyer and guided-missile cruiser. The focused-mission littoral combat ship will use a reconfigurable platform or sea frame to deploy modules and warfighting capabilities to meet littoral operational requirements.

The 20-year deepwater program is a \$17 billion (in FY98 dollars) integrated effort by the Coast Guard to upgrade surface and air assets while developing more capable platforms, including improved systems for

command, control, communications, computers, intelligence, surveillance, and reconnaissance (C⁴ISR) and advanced logistic capabilities. When fully implemented, the

total integrated deepwater system will consist of three classes of cutters and associated small boats, upgraded fixed-wing aircraft, new and upgraded helicopters, and cutter- and land-based unmanned aerial vehicles (UAVs).

Separate but related ship acquisitions are charting new seas to recapitalize maritime forces and transform their operational capabilities in response to 21st century requirements. The defense acquisition process is also being transformed. This cooperative venture is critical to realizing a totally interoperable fleet.

The New Way of War

Military transformation is proceeding apace. The Navy and Coast Guard—indeed all the services—have no alternative but to transform as they recapitalize by adopting bold new concepts and accelerating the rate of affordable change in a way that ensures continued high levels of operational excellence. One definition of transformation holds that it is the productive integration of technological change. The Chairman argues that transformation involves more than technology; it is a process and mindset entailing intellectual, cultural, and technological dimensions.

In endeavoring to transform the maritime forces, it is useful to consider recent operations. The steady transformation since the Persian Gulf War was apparent during Enduring Freedom and

Iraqi Freedom. Both manifested improvements in joint warfighting doctrine, including large-scale special operations, tactical agility, and interservice cooperation; more accurate, lethal, and abundant all-weather precision-guided munitions to enable effects-based targeting; and the development of a netted force with the C⁴ISR systems to enable responsive decisionmaking and effective force employment. Transformational developments generate a significant force multiplier for naval and other forces even when legacy platforms are employed—compounding fighting power, flexibility, and speed of response in the battlespace. The Chairman maintains that this trend is redefining the American way of war—a shift from the strategy of annihilation that guided operations during the Civil War and World War II to a new model described as “waging precise and focused war.”

Coalition forces in Iraq demonstrated their flexibility by adapting a war plan quickly when confronted with rapidly changing circumstances. This flexibility characterized nearly every aspect of operations—from the insertion of Special Operations Forces inside Iraq to the seaborne deployment and support of ground forces, use of large numbers of precision-guided munitions and long-range cruise missiles delivered by aircraft and launched from surface ships and submarines, and deployment of soldiers and marines fighting dangerous three-block wars during a 350-mile dash from the Kuwaiti coast to Baghdad. Fortunately, network-centric C⁴ISR systems linked Coalition forces and provided land, sea, and air commanders with the situational awareness to move quickly inside the decision loop of isolated and fragmented Iraqi commanders, making it impossible for them to keep up with the tempo.

The Coast Guard participated in the operation, deploying two high-endurance cutters, eight patrol boats, a buoy tender, four port-security units, strike-team personnel, and two maintenance support units to the Arabian Gulf and Mediterranean. The presence of white, black, and gray hulls is another reminder of joint warfare today. Speaking to the Navy League, Clark praised the Coast Guard for its role in global port security since 9/11.

Military contingencies over the past decade have demonstrated that the littorals—especially in the Mediterranean, northern Arabian Sea, and western Pacific—loom large in the convergence of national economic and security interests. The likelihood of regional conflict, heightened sensitivity over sovereign rights of other nations, and transnational threats to security suggest that seabasing capabilities will become increasingly vital.

the Navy and Coast Guard have no alternative but to transform in a way that ensures operational excellence



U.S. Coast Guard (Zach Zubricki)

USCGC James Renkin
patrolling Baltimore
Harbor.

This outlook underscores the importance of transforming naval forces to ensure continued and uninterrupted access to the littorals. A national fleet with new cutters, littoral combat ships, and other deepwater assets designed for seamless interoperability will be a force multiplier across a range of missions, including force protection, power projection, and maritime intercept. Littoral combat ships are relevant to future Navy requirements while the Coast Guard seeks to leverage them as part of deepwater recapitalization.

The Transformation Imperative

According to the director of the Office of Force Transformation, Vice Admiral Arthur Cebrowski, USN (Ret.), the United States must not only sustain the current pace of transformation to retain its advantage in future combat operations, but also outpace current and potential enemies: “We must recognize power is moving to a system level while violence migrates downward to the level of individuals.” He has emphasized the steps which the Armed Forces must take as:

- creating the future by coevolving technology, organizations, and processes

- reevaluating warfighting attributes based on their ability to access and contribute to larger information networks, shared situational awareness, and speed of command

- networking, including partnerships
- deterring forward—developing high rates of change that an enemy cannot outpace and that require forces oriented around speed of deployment, organization, employment, and sustainment.

“The entry fee for a deter-forward force,” as Cebrowski wrote, “is a network-centric structure, organizations, and understanding of the theory of war for the information age.”

As Iraqi Freedom was demonstrating combat advantages of the Armed Forces to the world, the Secretary of Defense issued *Transformational Planning Guidance*. In offering a clear vision, he noted that the military must “think differently and develop the kinds of forces and capabilities that can adapt quickly to new challenges and to unexpected circumstances. . . . We must promote an entrepreneurial approach . . . one that encourages people to be proactive, not reactive, and anticipates threats before they emerge.”

The littoral combat ship and deepwater system-of-systems force structure will provide the capabilities to ensure that the national fleet is a deter-forward force. Each program is advancing in a way that conforms with defense policy and planning guidance for transformation.

The objectives of the transformational roadmap underpin Navy-Coast Guard collaboration to achieve fully interoperable, compatible, and complementary forces that share the responsibility to meet national maritime security and defense needs in a highly cost-effective way.

A Common Effort

According to the President, transformation will yield a force “defined less by size and more by mobility and swiftness, one that is easier to deploy and sustain, [and also] one that relies more heavily on stealth, precision weaponry, and information technologies.” This process is viewed in

Transformation Planning Guidance

- *Transforming how we fight*—developing joint warfighting concepts that include the full range of supporting military capability areas
- *Transforming how we do business*—planning and business practices such as adaptive planning, a more entrepreneurial, future-oriented capabilities-based resource-allocation planning process, accelerated acquisition cycles built on spiral development, output-based management, and a reformed analytic support agenda
- *Transforming how we work with others*—integrating military power with other instruments of national power; working with other departments to share information on transformation programs to help guarantee compatibility and encourage other agencies to follow suit as appropriate—including arrangements for international military cooperation to ensure that rapidly transforming U.S. capabilities can be applied effectively with allied and coalition capabilities.

JFQ

[The full text of this planning guidance is found at <http://www.oft.osd.mil/>.]



Littoral combat ship.

General Dynamics

the littoral combat ship will be small, fast, and optimized for shallow water with a maximum draft of 20 feet

the transformational planning guidance as shaping “the changing nature of military competition and cooperation through new combinations of

concepts, capabilities, people, and organizations . . . to sustain our strategic position.” This planning guidance offers a concise approach for transforming by identifying critical elements, assigning roles and responsibilities,

describing new organizational structures, and depicting desired outcomes. This effort includes three areas that are directly correlated with Navy and Coast Guard recapitalization programs.

The national fleet policy provides specific goals for linking the integrated deepwater system to the littoral combat ship program. Implementation of this guidance will transform collaboration between the two services by stipulating:

- commitment to shared purpose and common effort focused on tailored operational integration of service multimission platforms, infrastructure, and personnel
- full cooperation and integration of nonredundant and complementary capabilities to ensure the highest level of maritime readiness for the Nation
- processes to synchronize research and development, planning, fiscal accountability, procurement, doctrine, training, and execution of operations for the national fleet
- ensuring ships, boats, aircraft, and command and control ashore nodes of the national fleet will be interoperable to provide force depth for peacetime missions, homeland security, crisis response, and wartime tasks.

The Coast Guard contribution to the national fleet includes its statutory authorities (including law enforcement), multimission cutters, boats, aircraft, and C²ISR systems designed for the full range of Coast Guard missions.

In general, LCS design will be optimized to assure access and the ability to exploit littoral waters as maneuver space for naval, joint, and combined expeditionary forces. Each ship will also be configured to focus on countering one of three proliferating, asymmetric threats—mines, diesel submarines, and small, fast surface craft—and will be capable of performing other assignments such as intelligence, surveillance, reconnaissance (ISR), homeland defense, special operations, or logistic support. The primary mission capabilities will be addressed with a mix of manned and unmanned systems (vehicles or sensors) deployed on, above, or under the sea. The littoral combat ship will be unlike previous surface combatants; it will be small, displacing 1,000–4,000 tons; fast, with speeds up to 50 knots; and optimized for shallow water with a maximum draft of 20 feet.

Spiral development and evolutionary upgrades will be achieved by exchanging modular mission payloads or packages that are plugged into an open-systems architecture designed for accessibility and interoperability with other ship and system components. Readily transportable packages will provide sensors and combat systems in each littoral combat ship based on a designated mission as determined by the assigned naval or joint force commander.

Modular, open architecture is a sea change in designing surface combatants, operationally employed, and technologically upgraded. Platforms will act as seaframes (the naval equivalent of airframes) to deliver specific payloads and tailored capabilities for users. Mission packages will be devised independently of the seaframe and accompanied by operations and maintenance personnel trained to accomplish the assigned warfighting mission task and ensure continued performance of mission modules.

The reconfigurable LCS design will allow modules to be removed and replaced without putting ships into dry dock, cutting holes, modifying codes, or running cables and piping through the hull and superstructure. Each mission payload will be engineered for incremental upgrades of pre-installed systems and complete change-out in theater. This modular mission approach to sea combat capability also mitigates risk in adapting to emerging technologies by providing a path for future technology insertion. Developed, tested, and evaluated in a process separate and distinct from the actual LCS hull, the



U.S. Coast Guard (Tom Spurduto)

Coast Guard port security boat, Iraq.

availability and affordability of the ship will not be determined by the success or failure of a single developmental item or capability.

To enhance survivability and operational agility, littoral combat ships will incorporate low-observable technologies and use evasive speed to maneuver quickly in and exploit littoral areas of interest without being detected. By leveraging advances from the next-generation multimission destroyer program, the ships will be designed with integral acoustic quieting, noise monitoring, and controlled magnetic, anti-mine signatures.

Operational Flexibility

Another transformational aspect of the littoral combat ship is its operational flexibility when a new mission capability is required in theater. Conceptually, a new modular mission package and its personnel detachment could be airlifted, transported, or prepositioned for delivery to a deployed ship and exchanged for old personnel and equipment within days.

With the capabilities of unmanned vehicles to both provide real-time intelligence and deliver ordnance on target, littoral combat ships will have flight decks and support facilities for both these vehicles and helicopters. Off-board vehicles will contribute to network-centric and combat support operations, including rapid launch and recovery of small boats or special operations craft. Like the host ships, manned and unmanned vehicles alike will feature integral modular-mission capabilities through interchangeable vehicle payloads.

Littoral combat ships will be manned with most personnel assigned to module detachments and crew size determined by the modular mission. The optimal manning concept will permit ships to remain on station for extended periods

with crew rotations in theater. These ships will possess the speed and endurance to transit and operate with either carrier strike or expeditionary strike groups. For sustained operations, they will have both conventional underway and vertical replenishment capability and exploit automated and modular technologies for all at-sea and in-port material handling.

The fully netted disposition of multimission ships is important in the operational construct for littoral combat ships. Additional combat support may be required from platforms with different modular mission packages, ground or sea-based tactical air, or multimission cruisers or destroyers in adjacent waters. Operating independently in LCS squadrons or with other platforms will extend capabilities to counter challenging anti-access littoral threats while enabling larger naval, joint, or coalition task forces to fight and win across the full range of conflict scenarios.

System of Systems

For the Coast Guard, the integrated deepwater system will lead to important changes in operational capabilities and the acquisition process. The award of the contract to Integrated Coast Guard Systems (ICGS) in June 2002, a joint venture between Northrop Grumman and Lockheed Martin, marked a major milestone.

Unlike similar programs of the past, deepwater represents a system-of-systems approach to recapitalization by the Coast Guard that breaks new ground by implementing a performance-based acquisition model of extraordinary scope and complexity. ICGS serves as a full-industry partner for the service. In the years ahead, legacy helicopters, aircraft, and patrol craft will be upgraded as more capable deepwater cutters, aircraft, and UAVs are introduced.

As the lead agency for maritime homeland security, the Coast Guard plays a critical role in providing a layered defense to project U.S. borders out to sea from ports, waterways, and coastal areas. Improving operational capabilities for this security mission is an important element of Coast Guard strategy, and the deepwater program stands at center stage.

The program will provide operational capabilities, capacity, platforms, and systems that can prevent attacks. Emerging requirements, especially those associated with maritime homeland security, are being evaluated for inclusion in the program. In addition, its more capable platforms will also benefit traditional Coast Guard missions, including maritime safety, protection of natural resources, maritime mobility, and national defense.

Eagle Eye unmanned aerial vehicle.



Bell Helicopter/Textron

An interoperable deepwater C⁴ISR system will be a critical enabler for the Coast Guard in developing maritime domain awareness—comprehensive information, intelligence, and knowledge of relevant entities in the maritime domain that can affect the security, economy, and environment of the Nation. This awareness will contribute to improved risk management, more productive use of operational assets, and a common operational picture. More capable platforms and C⁴ISR will expand surveillance and detection efforts with assets that could also assist other agencies as new joint competencies are forged.

The integrated logistics system will form a solid basis for transformation, driving platform design that will result in higher operational readiness, improved safety, and lower operating costs. This process demands an acquisition strategy of comparable vision and innovation. The deepwater mission calls for interoperable platforms and supporting systems to meet performance-based requirements by maximizing operational effectiveness while minimizing total ownership costs. Its needs statement outlines a systems solution to recapitalization: “The goal of this effort is not to replace ships, aircraft, and sensors with more ships, aircraft, and sensors, but to provide the Coast Guard with the functional capabilities required to achieve mission success safely.”

The emphasis is placed on the industrial sector to assess the deepwater system and integrate planning for asset comparability and interoperability while providing operational effectiveness and affordability. Cost is regarded as an independent variable in the acquisition program, which is essential for the Coast Guard to remain within the planned annual expenditure of \$500 million (in FY98 dollars) over the life of the program.

ICGS partners in industry were provided the performance specifications needed to achieve system-wide capabilities. This allows industry to both leverage state-of-the-market technology and bring innovation and industrial capacity to bear most effectively. Commercial items will be basic building blocks for deepwater assets and components.

The performance measurement plan, developed with Integrated Coast Guard Systems, will measure and track performance against the basic requirement to maximize operational effectiveness while minimizing total ownership costs. A comprehensive mitigation strategy is in place to address risks associated with the program’s cost, schedule, and performance.

Enduring partnerships and joint competencies are another important factor in structuring the deepwater program. This interaction is underscored on all levels—from integrated product teams to relations between the Departments of Defense and Homeland Security as well as other players, including allies and friends around the



U.S. Navy

Signing updated National Fleet Policy Statement.

world. The Navy-Coast Guard partnership associated with the transformational development and acquisition of the selected deepwater assets and the littoral combat ship will be a work in progress for many years.

Transformation Intersections

As the Navy transforms forces, technologies, and operating concepts within the framework of *Sea Power 21*, the Coast Guard integrated deepwater system recapitalization strategy offers a number of transformation intersections where the operational requirements of each service overlap.

With regard to the national fleet, the foundation of *Sea Power 21* rests with the network-centric capability that FORCENet and systems such as cooperative engagement capability offer commanders—an evolutionary but dramatic transition to a force that can share digital tactical information and sensor data seamlessly among ground, surface, submerged, air, and space platforms that are broadly dispersed across an operational theater.

FORCENet, an operational construct and architectural framework for naval warfare, will integrate sensors, weapons, networks, and platforms to give commanders more accurate battlespace awareness and information dominance. It will provide the means and context for projecting a real-time, common operational picture to all battle force assets aimed at achieving advantages in tactical engagement speed, accuracy, and range.

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A similar vision guides the development of the deepwater plans to upgrade and modernize surface and air platforms and support the C⁴ISR system for the multiple Coast Guard missions. The latter will be a critical enabler for attaining maritime domain awareness—an essential ingredient of maritime homeland security.

The deepwater C⁴ISR system will convey data among integrated deepwater system assets and other Federal, state, and local agencies. Just as FORCENet will transform Navy operational capabilities by enabling decisionmaking and massed warfighting effects, deepwater transformation will result in platforms serving as nodes for shared information with command centers ashore, a potent force multiplier that will contribute directly to maritime domain awareness and a common operational picture.

This network-centric vision translates into a consideration of working together to conduct homeland security and defense missions. Terrorist threats make the coastal region of the maritime domain a geographic zone of immense importance. The transition from a homeland security incident to a homeland defense emergency in littoral waters could take place in minutes, not hours. That said, all responsible Federal agencies and military services must possess seamless interoperability and connectivity. Our services are on the road toward this end.

The agreement the Navy and Coast Guard signed in 2002 established a working group to specify common technologies, systems, and processes critical to the design and development of the deepwater national security cutter, offshore patrol cutter, and patrol boats as well as the littoral combat ship. This group holds regular exchanges on multiple levels to ensure that the services derive mutual benefits through a cooperative technical approach.

The characteristics of the littoral combat ship could lead to a capable deepwater offshore patrol cutter—a hull with double the speed now contemplated. Adding 25 Coast Guard bottoms based on this design would complement Navy shipbuilding. LCS modular mission packages, on deepwater hulls as dictated by operational requirements, would amplify the national fleet multiplier effect. Logistic commonality would allow both services to leverage maintenance and support programs to achieve mutual efficiencies.

One possible outcome is that littoral combat ships could become white-hulled with a Coast Guard stripe; another is that they could be painted gray with platforms configured for specialized systems and modular force packages.

USCGC Midgett alongside USS Constellation



U.S. Coast Guard (Alice Semnott)

Moreover, allies could define their own requirements, thus making littoral combat ships international assets. This synergy would support national fleet policy with common technologies, systems, and processes for a network-centric, interoperable force.

Interservice cooperation in replacing obsolete medium- and high-endurance cutters could be extended to future mission systems. In February 2003, Bell Helicopter was awarded a contract to begin concept and preliminary design on the vertical takeoff and landing unmanned aerial vehicle. Eagle Eye will be deployed on board new deepwater offshore patrol and national security cutters as well as *Famous* class medium-endurance legacy cutters. Their projected completion in 2006 will coincide with delivery of the first national security cutter. Up to four vehicles can be deployed on each cutter, or two may deploy jointly when a helicopter is embarked.

Eagle Eye will be able to accept modular mission payloads. With a planned endurance of 6.2 hours and dash airspeed of 220 knots, it will improve detection, surveillance, and monitoring capacity across the fleet. Extending shipboard capabilities will enhance the process of classifying

and identifying targets of interest, enabling important contributions to maritime domain awareness. This air asset could be deployed aboard littoral combat ships or other vessels.

In the evolution of naval forces, there has rarely been an opportunity to design future fleets. Acquisition strategies usually consist of progressive system upgrades and class-by-class platform recapitalization. This approach has changed in recent years with the chance to transform in ways that were difficult to envision a generation ago. Advances in materials, technologies, and systems offer unparalleled openings to infuse innovative capabilities in networked and distributed forces. The Navy and Coast Guard are committed not only to a partnership in creating a national fleet, but in reforming the acquisition process. **JFQ**



Special Forces
in Baghdad.

U.S. Air Force (Jeremy T. Lock)

Linking Conventional and Special Operations Forces

By RONALD S. MANGUM

The Armed Forces have consistently demonstrated their skill in conducting joint operations. However, their capability exists almost exclusively on the operational level. To cope with nonstate enemies in the global war on terrorism, jointness must extend down to the tactical level. Small and agile joint units, self-sustaining or with reachback logistics, executing missions independently but

based on national source real-time intelligence, are the wave of the future.

The interface between special operations and conventional forces on the division and corps level is a critical seam in joint doctrine. Likewise, the Special Operations Forces (SOF) community must examine its doctrinal interface at the seam between joint and combined operations. Examples from the Korean peninsula are useful because joint and combined forces operate there every day in a standing theater of war. But the same concepts are relevant for future conflicts in which

Brigadier General Ronald S. Mangum, USAR, is commander of Special Operations Command Korea and formerly served as commander, 1st Brigade, 85th Division (Training Support).

special operations and conventional forces will work together.

Doctrinal Synchronization

Special Operations Forces typically function on the operational and strategic levels but in reality are tactical assets with a strategic impact. As such they interface with conventional forces on several levels. A joint special operations component command (JFSOCC) is a headquarters that provides liaison with other components. It has planners, operators, and intelligence personnel at multiple points within a theater. Coordination and synchronization between special operations and conventional forces is key, not only to multiply the effects of friendly engagement but to prevent fratricide among friendly units. Both tasks are more difficult in combined warfare.

One doctrinal connection in the area of responsibility of a corps or division on the operational and tactical levels is the special operations command and control element (SOCCE). As an Army element, Special

Forces have traditionally been concerned only with other Army SOF units. In joint and combined warfare, however, it must coordinate all SOF—Army, Navy, Air Force, and allied forces operating within the area of responsibility of its supported unit.

Within a corps or division area, Special Operations Forces come under SOF command and control, although in some situations they may be placed under the operational control of supported commanders. Field Manual 3-05.2 stipulates that while Special Operations Forces are not usually integrated into conventional forces, it is necessary for the “simultaneous or sequenced execution of separate actions in time and space to achieve a synergistic effect.” A special operations command and control element is the doctrinal synchronization organization with operational or tactical control of Special Operations Forces in the area of responsibility of supported units and is also equipped to provide communications with either JFSOCC or Special Forces group headquarters.

Special operations command and control elements are formed around an existing table of organization and equipment, such as a Special Forces company headquarters. In some situations they may be organized around battalion headquarters. The element arrives at the supported headquarters with personnel and equipment for a minimum of 30 days. Traditionally this mission provides connectivity only with Special Forces in their role as “the primary and often the only direct link from the conventional forces to the SOF

command and control structure.” In the joint warfighting environment, however, it can operate with allied corps or division headquarters and be composed of both U.S. and allied forces. Current doctrine recognizes that augmentation may be needed, but it does not flesh out such augmentation well, nor are there routine opportunities to train as a joint and combined force operating in a joint and combined environment.

For example, each field army in Korea is augmented by a special operations command and control element organized around a Special Forces operational detachment in its headquarters. The reality is that each field army is on the coast, so ROK and U.S. Army Special Forces and Navy SEALs, as well as Air Force aircrews and special tactical squadron personnel, can be expected to operate in the area in front of the field army. Currently a special operations command and control element is composed exclusively of Army personnel and has little visibility outside its own area of responsibility. In Korea, Special Operations Command Korea combines with ROK Special Warfare Command to form the combined unconventional warfare task force during wartime.

A special operations command and control element may be augmented by Korean personnel to provide language capability because the task force has a combined forward operating base with the field army headquarters, which has a Korean element that commands operational detachments within the area of responsibility. Duplicating control mechanisms does not provide redundancy because the command and control element and operating base do not coordinate their efforts. Thus only Army personnel synchronize the effects of Army-only teams (sometimes with Korean forces) within the area of responsibility of the field army. Not only is the expertise of SOCCE personnel limited to Army functions, but the communications package that accompanies this element is set up to meet only the needs of the Army mission. Doctrine, training, and equipping need to emphasize the joint special operations part of the SOCCE title, so the element is staffed and trained to control all Special Operations Forces in the field army area of responsibility.

In addition to staffing and equipping a command and control element to accomplish the full range of SOF control, a fully manned element must train routinely as a unit to perform its mission. A one-time deployment to Korea for an exercise, anticipating that an element will garner the requisite knowledge, is unrealistic. And to expect it to grasp the complexities of the Korean theater of operations during wartime courts disaster. The joint mission essential task list for each Special Forces operational headquarters needs to

SOCCE is staffed to control all Special Operations Forces in the field army area of responsibility

Special operations
boats, Iraqi Freedom.



U.S. Navy (Alic Abrahamson)

contain specific tasks for operating as a joint command and control element in a coalition environment, and these headquarters need the opportunity to train in that environment.

Although a special operations command and control element may be rotated to the National Training Center, it is not situated at corps headquarters, which has units in the training box, since the corps is a player control element in the control center. And collocating a command and control element turns it into a white cell element, making it part of the exercise control center and privy to all aspects of the exercise, both friendly and enemy, which eliminates any gain from participating as a player unit. This is a typical exercise problem when the main units are conventional brigades or divisions. For an element to participate in its full mission profile, the exercise must have player units from the tactical to strategic level—for example, from battalion to theater army. Since that is costly, the SOF portion of the exercise often gets short shrift.

The Task at Hand

Perhaps the most critical task for a command and control element in synchronizing special operations and conventional forces is preventing fratricide among SOF units from close air support

and artillery. Without closely monitoring the fire support coordination line as it moves forward, fratricide is likely. The element needs access to the tactical operations center of the supported unit as well as real-time vision of the common operating picture. While there is no established answer to locating an element, it may be advisable to place it with the supported unit center. This provides access to a supported unit command structure. Separation from the special operations coordination detachment, which is a staff element at corps level or other supported unit, may be advisable. The detachment performs staff functions, not command and control, and collocation will confuse roles and may deflect critical command issues. Moreover, the element must provide intelligence up and down the chain. Operational detachments in front of the corps or army have eyes-on-target and can provide relevant intelligence to supported units. On the other hand, a special operations command and control element must ensure that intelligence reaches the detachments to assure their survival and mission success. Intelligence may simply be intelligence, but critical intelligence requirements are different at various locations on the battlefield.

What conventional force commanders must understand to fight a counterfire battle is not the same as what operational detachment commanders need to know to survive in the deep battle area. A special operations command and control

element must be able to access not only conventional force intelligence, but also JFSOCC intelligence products to ensure that feeds to deployed Special Operations Forces are relevant. Naval Special Warfare Command maintains a mission support center in San Diego to provide real-time intelligence to SEAL teams worldwide. The center does not eliminate the need for teams to get intelligence feeds from the theater joint intelligence center through JFSOCC, but it is another source of specific intelligence. Command and control elements, however, must be able to access every source that provides intelligence to its components to ensure that both levels have the same picture of the battlefield. Thus these elements, or at least JFSOCC, must be connected to national, theater, and center intelligence feeds.

A special operations command and control element must also provide guidance to deployed forces as the situation changes. It must transmit fragmentary orders to detachments to re-mission or modify missions. As conventional forces approach SOF team locations, the element must plan to implement the linkup. This is perhaps the most dangerous phase of the SOF mission as well as the phase that receives the least training and rehearsal. When the deployed forces include elements of Special Forces units as well as SEALs, implementing the linkup is delicate and critical. Hence the need for routine joint and combined augmentation and training.

Finally, according to Field Manual 3-05.2, while a special operations command and control element is not responsible for planning or executing civil affairs (CA) or psychological operations (PSYOP) activities except as incidental to its mission, both are performed by Special Operations Forces and may be integral to the mission. Often overlooked as a force multiplier, PSYOP proved valuable in Desert Storm by encouraging Iraqi soldiers to surrender and in Afghanistan by gaining the support of the civilian population. As soon as a semipermissive environment is established, CA units can assist in restoring governmental control by helping rebuild infrastructure. Deployed Special Forces teams are usually the first units in hostile areas and, if augmented by CA or PSYOP personnel, can assess the needs for civil affairs support and determine the impact of psychological operations on enemy forces as well as civilian populations. Consequently, augmenting an element with CA and PSYOP personnel assists in effectively using a range of SOF capabilities.

Requirements

In a coalition environment, a special operations command and control element needs routine joint augmentation. Foremost is a package that can establish secure communication with the theater special operations command, allied forces, and theater command system, including connectivity for the SEAL mission support center and other intelligence feeds, either directly or through JFSOCC. Communications with theater includes the ability to obtain the common relevant operating picture. In Korea this means connectivity to the Global Command and Control System-Korea.

A special operations command and control element must have qualified linguists in a coalition environment. Interpretation must not be left simply to contract or military personnel who are native speakers. Not every bilingual person can think in two languages. In addition, knowledge of military terminology in both languages is critical. Doctrine may be difficult to translate without detailed explanation.

Elements that will be expected to operate as special operations command and control resources in wartime need a habitual training and working relationship. Expecting an element to deploy to a theater as complicated as Korea and function effectively on arrival is unrealistic. Korea operates under three major command structures—the combined ROK/U.S. Forces Command, United Nations Command, and U.S. Forces Korea. Even after fifty years the two militaries are continually refining these multiple command and control structures. Where will ammunition, intelligence, and air support come from? Such questions should not wait until combat is under way. Consequently, besides defining a basic joint SOCCE structure, we must assure that the structure routinely operates in its host nation environment. Even if only some members have had that opportunity, there may be enough situational awareness and personal relationships with the host military to overcome cultural differences.

Personnel

To conduct joint and combined warfare, a special operations command and control element must be configured for success. Personnel will be chosen based on the mission and circumstances but would include—and each operational detachment should train with—certain common elements. Augmentation by Army and Air Force SOF aviation facilitates coordinated infiltration, exfiltration, and resupply missions by fixed and rotary wing air assets, with the joint special operations liaison element collocated with the air component command. If a command and control element has SEALs operating within its area

in a coalition environment, a special operations command and control element needs routine joint augmentation



MH-53 over firing range.

16th Special Operations Wing (Greg L. Davis)

of responsibility, it should have SEAL augmentation as connectivity with the naval special warfare command mission support center and the naval special operations liaison element collocated with the naval component command headquarters. This latter element would be part of a communications package for secure communications with higher and lower headquarters as well as with theater and allied headquarters.

Within a coalition, a special operations command and control element should be augmented with appropriate counterpart organizations from allied militaries as well as host nations. This will require interpreters from every contributing nation. In order to pass intelligence to allied forces, the element must have a trained foreign disclosure officer. Allies cannot access critical intelligence without this augmentation.

Moreover, a command and control element is not doctrinally responsible for either planning or conducting CA or PSYOP activities. That expertise will be required as the battle unfolds, and the activities must be planned in advance. After the victory over the Taliban, coalition forces looked to civil affairs units to provide humanitarian relief before winter and rebuild the infrastructure before the population soured on the national government and created conditions for a Taliban resurgence. When the U.S. military succeeds in crushing enemy forces, PSYOP and CA assets are needed to consolidate the victory and avoid slipping back into hostile conditions.

The Way Ahead

Current doctrine must be reviewed in light of the demand for special operations command and control elements in a joint and combined environment. Tasks must be developed and missions anticipated so forces are prepared to assume



Fleet Combat Camera Group, Pacific (Kathrina Beeler)

joint planning challenges first hand. The Joint Special Operations University should develop a program of instruction and exercise on joint manning. Joint Readiness Training Center and National Training Center rotations should include a joint special operations command and control element, but the exercise must be scripted to portray group interaction on the division, corps, and theater levels.

Simulation exercises are a cost-effective way of training headquarters and staffs without the expense of deploying troops to the field, but they do not portray Special Operations Forces well. They concentrate on the main battle area, which is usually focused in time and terrain. Because Special Operations Forces normally operate deep in the battlespace, it becomes difficult to model the large terrain areas necessary to accommodate special operations and conventional forces in the same exercise. Without combining these two warfighting elements, however, realistic training for special operations command and control elements is lost. Consequently, the best full mission profile training is probably in conjunction with major joint exercises such as Ulchi Focus Lens. Yet because Korean units are practicing defending their territory while Special Operations Forces train to deploy in enemy territory, there is an artificiality that must be bridged by careful scripting.

Getting the interface right between special operations and conventional forces on the tactical level is critical to the conduct of joint and combined warfare. Although Special Operations Forces are working jointly on the operational and strategic levels, they must be able to extend jointness to the tactical level by effectively staffing and training special operations command and control elements.

JFQ

Conducting search and rescue.

this responsibility. Beyond simply identifying the mission and tasks in doctrinal publications, forces must train to appropriate mission standards to accomplish their assignments. This consideration, along with habitual training relationships, is important to the transition to warfare in areas in which Special Operations Forces deploy.

One way to increase the abilities of a special operations command and control element is including basics such as the Special Forces qualification course exercise to enable students to learn



The Evolution of Special Operations Joint Fires

By ERIC BRAGANCA

1st Combat Camera Squadron (Aaron Allmon)

A familiar complaint about Special Operations Forces (SOF) is that they are not integrated with conventional forces. Moreover, they are suspected of regarding themselves as strategic assets. However, SOF leaders recognize that they support other forces—land, sea, air, and space—just as those forces support special operations and one another. This reality has led to the improvement of special operations joint fires in Iraq, which is largely based on experiences in Afghanistan.

Special Operations Forces made great progress in integrating joint fires by borrowing ideas from three distinct battlespaces during Iraqi

Freedom. The use of joint fires and air coordination elements assured these successes and should provide a model for the future.

Prior to Enduring Freedom in Afghanistan, Special Operations Forces understood the need to integrate joint fires. Doctrine indicates that SOF headquarters should include joint fires expertise in mission planning and execution. But even after 9/11, those headquarters were reluctant to seek the support of outside joint fires in order to keep operations small and light, and they did not fully understand what was missing. Initially, they resisted this assistance on the tactical and operational levels, deploying teams without either terminal attack controllers or qualified operational planners and executors on their staffs.

However, based on a battlefield assessment, Special Operations Forces realized their errors and

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U.S. Air Force (Jeremy T. Lock)

took corrective action. With the air component, they organized a small but effective team to integrate operations. This cooperation became the model for Iraqi Freedom. But that operation was much more complicated because SOF assets operated in three environments, each with unique integration issues. These varied supported and supporting relationships required unique solutions to joint integration, and each serves as a model for future joint fires integration.

The next challenge is institutionalizing success. The conflicts in Afghanistan and Iraq were fought with the same land, sea, air, and special operations components. While other theaters have witnessed this success, they require details on SOF advances to adapt their lessons for the future. Special Operations Forces also play an important role in the global war on terrorism that transcends conventional boundaries and that will require increased personnel, some of whom should reinforce joint fires. One aspect of this capability is the link between special operations and conventional forces. U.S. Special Operations Command (SOCOM) and the Air Force should institutionalize the relationships among their subordinate commands to better respond to the next crisis.

Planning and Coordinating

For years joint doctrine did not list the duties or responsibilities for the fire support element of a joint special operations task force (JSOTF). Special Operations Forces eventually integrated joint fires in the theater air-ground system through Joint Publication 3-09, *Joint Fire Support*. The Army has

an extensive approach to linking organic fires (artillery, missiles, and helicopters) with Air Force close air support and interdiction using tactical air control parties attached to units down to battalion level. The Marine Corps has a similar arrangement connecting its air and ground fires. The Navy links strike aviation and missiles with the other services. Each path goes through a joint air operations center to ensure that campaigns are synchronized. Special Operations Forces only are connected to each other, reinforcing a perception that they are fighting their own war. Between 1998 and 2001, this started to change.

Prior to the war in Afghanistan, some headquarters realized the shortfall in operational fires expertise through joint exercises and began to address it. However, the effort proved insufficient. Joint Publication 3-05.1, *Joint Tactics, Techniques, and Procedures for Joint Special Operations Task Force Operations*, was being revised as the conflict in Afghanistan began and included details on the fire support element, including coordinating boundaries, representing special operations to agencies such as the joint targeting and coordination board, and preventing fratricide. This volume also recommended a fire support annex to the task force operation order and standard operating procedures. However, none of these were in place when operations began in Afghanistan, thus lessons were learned through experience.

Task Force Dagger, the initial joint special operations task force for Afghanistan, was built around a Special Forces group headquarters and faced problems using joint fires on the tactical and operational levels. Teams deployed without terminal attack controllers—Air Force troops trained and were certified to control close air support. Unsuccessful close air support in the first few days of combat indicated the need for expertise, which led the task force commander to deploy trained ground controllers. They had an immediate positive effect on the campaign.

Within days the Special Forces team had qualified terminal attack controllers. This posed problems when air-savvy ground controllers sent air support requests to the task force. No one in the headquarters could handle integration—incorporating joint fires in campaign planning, collating or submitting subordinate fires requests, and deconflicting operations. Though there was a special operations liaison element at air component level, the task force almost exclusively relied on liaison for deconfliction and integration. This resulted in limited success but was not the complete answer because the liaison cell was located with the air component in Saudi Arabia, leaving the task force with no resident expertise to incorporate fires in the campaign.

30th Space Communications Squadron (Richard Freeland)

B-52 refueling, Iraqi Freedom.

Fortunately, the air component commander deployed a small element of the same type used to support conventional Army maneuver. Like controllers on the battlefield, this dramatic initiative enhanced coordination and integration with the air component. Teams on the ground

the joint air component element provided the ability to plan and coordinate joint air fires

experienced this improvement when close air support became readily available. This Air Force element, known as the joint air component element, provided what Special Operations Forces lacked—the ability to plan and coordinate joint air fires.

Iraqi Freedom

As operations continued in Afghanistan, U.S. Central Command focused on planning for Iraq. Its land, air, and special operations components—Third Army, Ninth Air Force, and Special Operations Command Central (SOCCENT)—created a joint fires architecture. SOF units fought in the north, west, and south. They stopped the enemy in the north, which had fortified the unofficial boundary with the Kurds, from reinforcing Baghdad. To the west they assisted the air component to prevent the launch of SCUDs and other theater ballistic missiles. And they supported the land component in the south to take Baghdad and eliminate elite forces such as the Republican Guard. Because these three fronts required unique approaches to joint fires integration, Third Army, Ninth Air Force, and SOCCENT developed tailored packages for each one.

In the north, where the SOF commander was supported, the air component deployed a joint air component element to JSOTF (subordinate to

SOCCENT), which developed its own joint fires element. While these organizations worked together closely, they had separate identities because the joint air component element was directed exclusively on air operations as the joint fires element focused on lethal and non-lethal effects. In the west, where Special Operations Forces supported the air component in the counter-SCUD mission, joint air component and fires elements were fused into a homogeneous body. This worked because operations in the west focused on one mission and there was no need to distinguish between them. In the south, it used a different structure to integrate with the land component.

Integration in the land battle presented unique challenges. First, the two units subordinate to Third Army were organized differently for fires. 1st Marine Expeditionary Force and V Corps had distinct processes for deep operations where Special Operations Forces would be supporting them. Rather than a one-size-fits-all solution, SOCCENT and its subordinate commands organized a flexible system of command and control as well as liaison elements to ensure SOF capabilities supported both Third Army and its subordinate commands.

SOCCENT and Third Army exchanged liaison officers, ensuring conduits for information. By mutual agreement, SOF elements were sent to V Corps and 1st Marine Expeditionary Force. These special operations command and control elements (SOCCs) took tactical control of teams operating with ground forces to ensure that SOF operations were fully integrated. The element at V Corps also recognized the need for presence at subordinate divisions to keep commanders, who were directly supported, informed by deploying liaison elements. This integration was effective as SOF assets supported Third Army in front of and behind a nonlinear operation. With this scheme, Special Operations Forces reconnoitered lines of communication in advance of 3^d Infantry Division en route to Baghdad and supported 1st Marine Expeditionary Force with AC-130 gunships in rear areas, eliminating the *fedayeen* fighters,

Special Operations Forces solved integration challenges through innovation. The methods diverged but were tailor-made for battlespaces with disparate missions. Though for many Iraq was a unified effort, it was not for SOF units. They nominated over 5,200 targets while fighting on three fronts. They captured the northern oil fields, which contain one-third of Iraqi reserves, helped prevent theater ballistic missile launches, and took the southern oil distribution point in preparation for conventional forces. Such success was largely the result of agile thinking by architects of joint fires from Third Army, Ninth Air Force, and SOCCENT.



U.S. Air Force (Jeremy T. Lock)

Combat controller,
Afghanistan.

no theater special operations commands have standing joint fires elements to better prepare them

The Future

SOCENT learned painful but beneficial lessons in Afghanistan and Iraq. The challenge is institutionalizing them. By improving joint fires expertise in SOF headquarters, formalizing the link with the Air Force, and updating doctrine, those lessons will endure. They should be folded into training so that successive generations of warriors understand joint fires.

No theater special operations commands have standing joint fires elements to better prepare them to make this leap in ability.

Theater headquarters are small and lightly staffed with little fires expertise. Moreover, that is true of the SOF headquarters that formed many of the recent JSOTFs. By organizing standing special operations joint fires elements in each theater, there will be resident expertise during deliberate planning as well as exercise development. This asset will ensure that each theater special operations command establishes and maintains links to sister components and rehearses processes during operational battlestaff and field training exercises. Standing joint fires elements need not be as large

as those deployed in Iraq with up to 21 personnel in one command. With expertise in four areas (Army fire support, Navy and Air Force close air support/interdiction, and Marine Corps artillery), each SOF command could develop standard operating procedures, incorporate joint fires into deliberate operational and concept plans, and include these concepts in routine exercises.

SOCOM is preparing to absorb a large number of new positions to fight the global war on terrorism. Moving some assets to theater special operations commands as joint fires elements will achieve both tasks since improved joint fires integration will significantly help combat terrorism. And the Marine Corps is working with SOCOM to integrate some of its forces, which provides an opportunity to lend their joint fires expertise to SOF headquarters. With a three-legged joint fires effort, Special Operations Forces can ensure the long-term survival of the process which brought success in Iraq without the lengthy learning process which preceded it.

The other half of this success story was the Air Force tactical air control party—particularly joint air component elements. For years, Special

Loading 155mm
howitzer.



U.S. Marine Corps (Matthew J. Decker)

Operations Forces have been augmented by Air Force enlisted terminal attack controllers, including some who have been permanently attached as Special Forces trainers. But direct support relationship by these elements to JSOTF headquarters was new. SOCOM and the Air Force should formalize this arrangement for tactical and operational training purposes as well as contingencies. Linking specific headquarters with tactical air control, perhaps geographically, would create a standing relationship with common tactics, techniques, and procedures before contingencies erupt. Without a formal agreement, recent successes will fade and need to be revived with the same risks experienced by U.S. Central Command.

Lessons learned must also be incorporated into doctrine as proven methods for integration. Joint special operations doctrine is being revised with joint fire support scheduled to be included. These are the first areas in which these new methods should be addressed. Related joint doctrine must eventually be revised as service doctrine is modified in this collaborative effort.

Progress should be institutionalized by extending joint fires expertise to SOF headquarters, formalizing the links between U.S. Special Operations Command and the Air Force and updating joint doctrine for the next conflict.

Special Operations Forces made dramatic progress in joint integration by the end of combat operations in Iraq. No longer seen as fighting

their own war, they were fully integrated with other forces as both supported and supporting assets during the campaign. A major part of this success was joint fires, which began before the Afghanistan conflict and culminated in Iraq.

SOCENT learned valuable lessons in Afghanistan and, through a collaborative effort with other components, established a network of joint fires, air coordination, and command and control elements on multiple levels. Special Operations Forces applied different joint fires solutions on three fronts in Iraq, tailored to specific circumstances. They were supported in the north with joint fires linked to air component elements employing traditional Army side-by-side integration. They supported the air component in the west, merging joint fires with joint air component elements. Their complex support to the land component in the south required a more detailed infrastructure of command and control elements and liaison, ensuring the appropriate expertise.

Special Operations Forces learned valuable lessons in both Afghanistan and Iraq that must be institutionalized. Capabilities cannot be developed after a crisis occurs.

JFQ



Transforming

Joint Warfighting Capabilities

By SCOTT E. JASPER

The global war on terrorism has validated the need for accelerating military transformation. The national security strategy directed the process to examine how enemies may fight, rather than where and when, reaffirming a shift from threat-based to capabilities-based planning. Moreover, the Secretary of Defense instructed the Armed Forces to first “pursue the global war on terrorism” and second “strengthen joint warfighting capabilities.” Those capabilities are critical in

detering and defeating enemies that rely on surprise, deception, and asymmetric warfare.

Military transformation is the process of rendering previous methods of warfare obsolete by changes in operational concepts, organizational structures, and technologies. U.S. Joint Forces Command (JFCOM) and the Joint Staff are working under guidance from the Office of Force Transformation and the Chairman to improve joint warfighting capabilities through initiatives such as joint force command and control, dominant maneuver, and rapid decisive operations; standing joint force headquarters; and joint experimentation with emerging technologies in events such as Millennium

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Training Philippine soldiers, Enduring Freedom.

Fleet Combat Camera Group, Pacific (Edward G. Martens)

Challenge. Transformation documentation has identified various capabilities required to dominate across military operations, including standing, deployable command and control systems, rapidly deployable and sustainable mission-oriented and tailored joint forces, pervasive targeting, shared situational awareness, precision effects, strategic mobility, and layered force protection.

The challenge is systematically prioritizing, testing, and fielding broad capabilities while avoiding theoretical and bureaucratic pitfalls in concept and architecture developments. In addition, getting these capabilities to warfighters in a timely fashion is critical, particularly in the information age with its rapid and compressed changes. Service transformation roadmaps indicate that future development of robust platforms and potential capabilities include unmanned, stealthy, long-range sensor, and deep-strike systems to counter enemy strategies as well as other innovative technologies. However, only by solving joint system interoperability problems will the awesome power of joint synergy be achieved across the battlespace with these platforms and capabilities. Among lessons from Afghanistan is a realization that joint system interoperability is key to operational success.

The U.S. Pacific Command (PACOM) joint mission force (JMF) developmental experience can assist in identifying revolutionary breakthroughs that yield measurable shifts in joint warfare. The command approach is moving from visionary concepts toward simple, practical, implemental solutions to current interoperability problems. Spiral development with regional operational forces in joint exercises validates results among those charged with executing the intent of a commander and speeds the fielding of solutions to the hard spots that prevent seamless joint operations.

Joint Mission Force

Commander, Pacific Command, called for a seamless joint-combined response force with sufficient flexibility to meet national objectives in 1999. That force would be capable of accomplishing missions across a range of operations, from complex contingencies to humanitarian assistance. It could serve as the leading edge in a conflict. The intention was eliminating service barriers and segmented components. It also sought advances in speed of reaction, command, and decisionmaking, which commanders were expected to implement by fiscal year 2003.

Bimonthly seminars and a tabletop game with warfighters and experts

in experimentation developed the JMF concept, defined as a package of 20,000 personnel from designated component ready forces. It is augmented by supporting commands, coalition partners, and a center of excellence coordinated group of international, nongovernmental, and private sector organizations from which a joint task force commander can tailor task forces for a range of missions. The key realization of the joint mission force was that interoperability linkages are at the heart of increased JTF effectiveness, specifically data-sharing and command and control challenges. Thus strategies to improve operations must strengthen links between task force and component headquarters.

Leveraging transformation on the operational level to achieve interoperability is consistent with the American way of war and crisis resolution outlined in *An Evolving Joint Perspective*, recently approved by the Joint Requirements Oversight Council. The architects of the JMF concept realized that relationships on joint and service headquarters staff levels foster trust and confidence in joint warfighting. PACOM established standing command and control relationships for crisis response by designating primary JTF headquarters, service or functional component commanders, and requirements for force structure and reaction times. The application of strategies to combine technological advances and organizational augmentation, doctrinal standardization, and mission-oriented training evaluations can provide near-term improvements that seriously change the conduct of joint warfare.

Compelling questions include which areas to focus on first, the best forums for testing experimentation strategies, and how to measure improvement. The immediate focus should be on fixing deficiencies in joint interoperability, then on capabilities to execute joint mission essential and service training tasks under future threat scenarios. Exercise and training venues sponsored by the Joint Staff can test capability initiatives with a regional audience. Assuring full interoperability across DOD requires

expanded venues such as distributed global command and control exercises and national training programs linked to regional commands. Recent proposals for a joint national training capability support this need. Success can be gauged by measures of effectiveness related to tempo, responsiveness, flexibility, and cost. The Joint Staff perspective offers clearly definable attributes. Future warfare and crisis resolution must be integrated, self-synchronized, continuous, simultaneous, distributed, effects focused, knowledge based, network centric, and nonlinear. By assigning metrics to these categories, an assessment of shifts in the conduct and character of war could be provided.

Defeating Enemy Strategies

Knowing how the other side might fight yields insights into the joint capabilities required to maintain a competitive advantage. Potential enemies could comprehend joint doctrine and refuse to fight on our terms. Their strategies could seek to dissuade, delay, or disrupt military intervention by the United States while raising the political, economic, and military costs. An enemy could use terrorism, commit atrocities, and leverage weapons of

insurgent, paramilitary, or guerrilla tactics could protract conflict and erode public support

mass destruction asymmetries at home and abroad while seeking surprise through delivery systems such as scuba divers, crop dusters, and container ships. They will attempt to counter asymmetrical U.S. strengths in power projection, space, stealth, precision, information operations, and strategic lift.

The principal enemy focus is likely to be countering access to the region of conflict. In the littoral, multi-layered coastal defenses consisting of submarines, small boats, anti-ship missiles, and mines could deny force deployment and concentration. Ballistic and cruise missiles could threaten bases, stocks, and ports. Over land, enemies could counter airpower superiority by integrated air defense systems,

global positioning, and surface-to-air missiles and anti-air artillery. They could deny precision targeting by concealment and deception and deny attack by hardening underground facilities, dispersing ground forces, and collocating with civilians.

Enemy strategies could include means to undermine national will at home and among allies. Misinformation campaigns that take advantage of the Internet and human exploitation methods that use hostages or refugees as human shields could manipulate public opinion. Likewise, insurgent, paramilitary, or guerrilla tactics such as systematic ambushes, hit and run attacks, and killing zones could protract conflict and erode public support. Attacks on infrastructure by computer network or biological agents that disrupt or destroy information, transportation, energy, economic, or other nodes could paralyze the Nation without channeling animosity against a visible enemy.

Understanding the depth of opposing capabilities provides rigor in crafting an examination. Falling barriers in cost and global marketing practices will grant enemies access to commercial off-the-shelf technologies such as wideband communications and high-resolution imagery. They will outsource, buy, or steal capabilities to fight in space and cyberspace, domains traditionally dominated by the United States. Joint warfighting capabilities need to be tested against this highly capable threat under possible conditions across the range of military operations. Achievement and sustainment of joint preeminence will not only ensure decisive response but also dissuade enemies from embarking on the road to conflict.

Interoperability Shortfalls

The joint mission force concept recognizes that an enemy may put a premium on continual assessment of developing crises and the ability to commit an effective, properly tailored, and fully integrated JTF in days, not weeks. Complex multinational military operations such as those in Somalia, Bosnia, Haiti, Kosovo, East Timor, and

Afghanistan also demonstrate the need for an effective multinational, multi-agency approach to complement a robust and versatile joint force tool kit ready to be employed at a moment's notice. Humanitarian emergencies created by typhoons, earthquakes, or volcanoes may explode into a catastrophic stage in days, leaving little time for the international community to assemble a coherent response. A rapidly tailored, jointly trained, multi-agency, multinational force will not just happen; it must be thoroughly developed, preferably before the crisis.

The Defense Planning Guidance for fiscal year 2004 directs regional commanders to create standing joint force headquarters by fiscal year 2005 in accordance with the lessons of Millennium Challenge. JFCOM envisions a flag officer-led, 55-member standing joint force command and control element (SJC²E) at each command, which would serve as a full-time core of functionally organized and skilled joint planners. The element would use standard operating procedures and command and control systems in a collaborative environment to perform contingency planning. The employment concept models the deployable JTF augmentation cell, which rapidly turns a JMF-type service headquarters into a joint team. However, the standing joint force command and control element would empower decision superiority for effects based operations through development of an operational net assessment based on a political, military, economic, social, infrastructure, and information analysis of the enemy.

PACOM planners considered establishing a standing joint force headquarters from theater assets but decided against it because of manpower constraints. They selected a hybrid concept of developing the joint command and control capabilities of designated single-service headquarters augmented by battle-rostered augmentees from other services. Planners focused on the fact that combined doctrine, command and control mechanisms, and shared training and experiences were lacking for rapidly assembling a



F-15, Cope Tiger '03.

1st Combat Camera Squadron (Jeffrey A. Wolfe)

military coalition. The joint mission force objective was crafted to enhance JTF speed of action, precision, and mission effectiveness. Achieving this objective began with identification of the top challenges to rapid, seamless joint and combined operations.

Input from theater staffs together with operational lessons and readiness reports produced an initial list. The challenges are JTF headquarters activation and augmentation; common standing operating procedures and collaborative tools; multilevel security procedures; a common operating picture; standard command, control, communications, computers, and intelligence (C⁴I); adequate training for complex interoperability issues; integrated force protection and rules of engagement; underdeveloped information operations; strategic lift forecasting; contingency contracting; and host nation support. The challenges were refined and prioritized in a second theater flag officer-led JMF wargame in May 2000. Conference members concluded that significant joint interoperability improvements come from routine interactions of commanders and staffs.

Implementing the Concept

Four primary strategies were created to improve on the challenges and implement the JMF concept: develop common procedures; develop effective C⁴I architecture through command

and control exercises; refine, develop, and package joint mission essential tasks; and modify PACOM training to include integrating experimentation. These strategies are outlined below with examples of how they can empower DOD-wide standing joint force headquarters implementation.

applying joint doctrine and joint tactics, techniques, and procedures can solve interoperability challenges

Develop common procedures. The first implementation strategy produced JTF procedures. They were established using diverse standard operating procedures and developed in functionally organized workshops. They were tested with joint task force and service component headquarters in a third JMF wargame and validated in Cobra Gold and Tandem Thrust. Totally joint standard operating procedures design starts with the intent of the commander, describes how the task force fights in boards and cells, details standardized internal staff procedures, and transmits information management techniques. This unique standard operating procedure is a compact disc linked with checklists, templates, and references for access to over 1,300 pages of data. Web

accessible links provide external access to both unclassified and classified sites, depending on the Internet security level, while keeping the procedures easily distributable to all official parties.

In late 2001, PACOM approved the standard operating procedures for mandatory use in all JTF exercises and operations. Besides standardizing procedures for complex interoperability-dependent tasks, it identifies activation and augmentation requirements, including the deployable augmentation cell that immediately provides key joint planners to service-based JTF and battle staff rosters that source critical personnel by service and specific skills. This cell has been in existence for years at PACOM, but it has now been refined and implemented with common procedures and collaborative tools. It is a potential precursor to the standing joint force command and control element.

Common headquarters procedures. The PACOM model has been selected as the prototype for developing common standard operating procedures for JTF headquarters, the basis of SJC²E. JFCOM has drafted procedures for review by unified commands that

could serve as an integrating factor across service and command bounds. The capability for internal linkage using a compact disc provides unlimited capacity to

identify region-specific parameters such as command relations or communication activation templates while mandating procedures for complex tasks such as joint fires and missile defense. Applying joint doctrine and joint tactics, techniques, and procedures can solve interoperability challenges. As JFCOM continues to demonstrate the merits of experimental concepts in information management, fires coordination, net assessment, and effects planning, proven procedures must be spirally integrated for a common JTF headquarters. Acceptance of these new procedures by warfighters on the operational and tactical levels can be realized in workshops and exercises to facilitate implementation of standing joint force headquarters within two years.

Standardized Web management. A key component of information

Task Force 51,
Iraqi Freedom.



U.S. Navy (Tom Dalry)

management procedures is the Web site. Service sites lack consistency, prove difficult for training distributed and rotational users, and fall short in optimizing data access. The JMF site offers a simple intuitive layout and standard appearance for concise display and information in three clicks. Web centric information pull is sustained by links to supporting sites and pages. The site provides for the routine, timely, and remote manipulation of information content by subject matter experts. Realizing that the site architecture does not satisfy service-directed specifications, PACOM has promulgated detailed and required certification criteria. Certification guidance covers Internet or Web compatibility and the layout to include window size, color, typography, and graphic format. Further requirements specify site identification, global navigation structure using tabs, local navigation structure using scrolling lists, event awareness indicators for classification, current conditions and time zones, and functional enhancements such as search aids and self-service updating. Adapting these criteria to

the SJC²E Web site can generate information management standardization across the defense establishment.

Headquarters linkages. PACOM directed the development of separate multinational force procedures that are based on the JTF model but focus on multinational operations on the coalition or combined task force level. These procedures are more generic and include broad operational considerations that partners can readily implement. Overarching operational start points (common frames of reference) that include a lead nation concept, common command or control-coordination relationships, standardized combined task force headquarters organization, common planning and decisionmaking processes, and clarity of terminology set the foundation for unity of effort within the task force. The centrifuge for multinational force standard operating procedures development has been the PACOM multinational planning and augmentation team program, which focuses on developing a cadre of military planners from nations with Asia-Pacific interests who are capable of rapidly augmenting

a multinational force headquarters for crisis action situations.

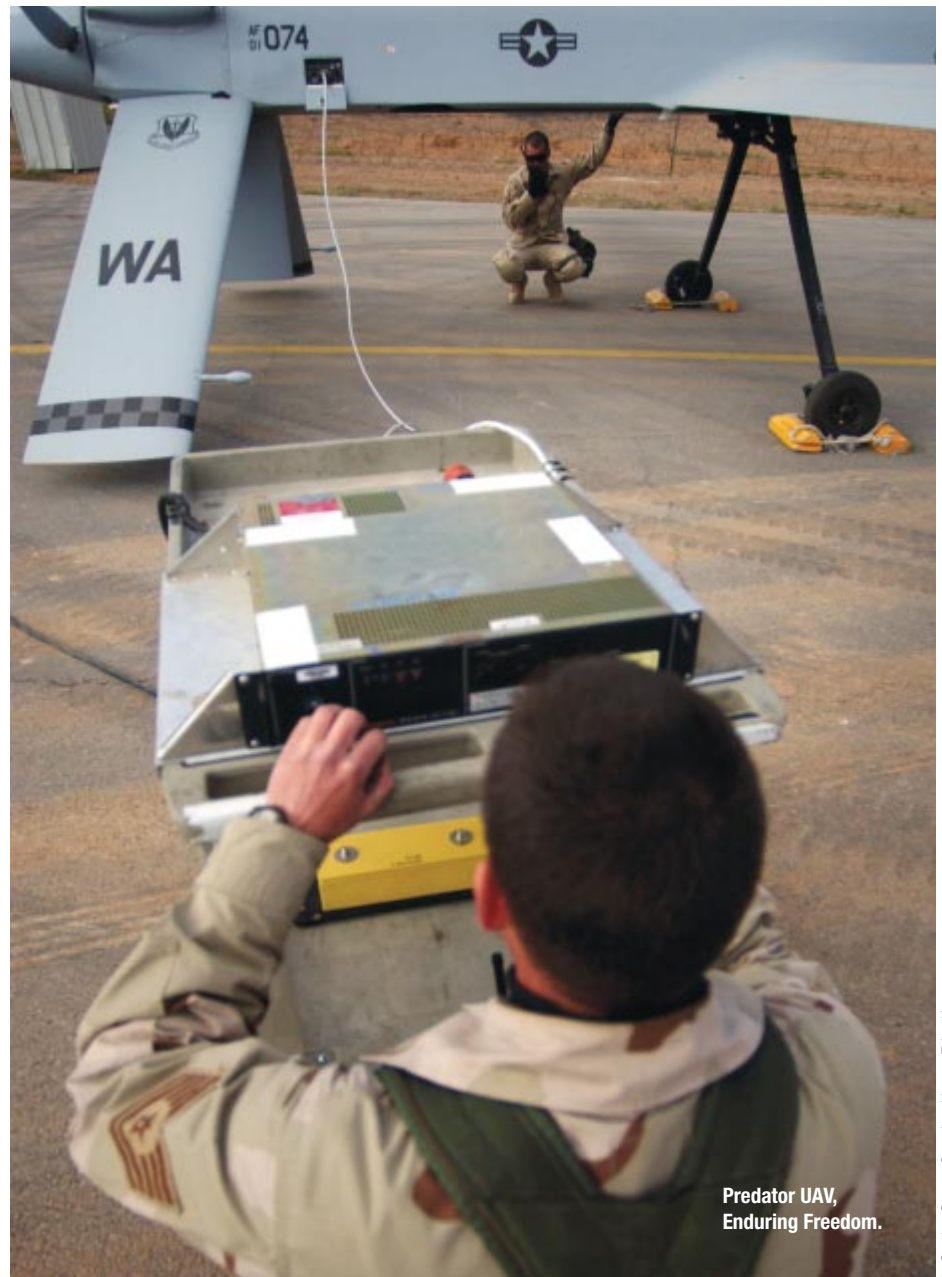
The team engages in concept development conferences on multinational force procedures in concert with semiannual workshops. Singapore hosted a recent exercise, Tempest Express Four, and acted as lead nation for combined task force headquarters with participation from 30 nations of the multinational planning and augmentation team. The focus was headquarters activation and crisis action planning procedures for a peacekeeping scenario that included combating terrorism. The Singaporean general who acted as event commander thought that Tempest Express was the best training he received prior to serving as combined task force commander in East Timor. By implementing multinational standard operating procedures across regional commands, planners can develop relationships and become adept at forming multinational, operational-level headquarters under common doctrine.

Effective C⁴I Architecture

The second implementation strategy established a series of command and control exercises (C²Xs) to develop C⁴I architecture. The program validates the command and control preparedness and proficiency of primary JTF and component commander staffs by executing basic procedures using fielded and experimental tactical systems and applications, documenting subsequent shortfalls and workarounds, and identifying solutions and associated timelines. The exercises are short, vignette-driven drills conducted originally as stand alone events and now in concert with major joint exercises. Focus and objectives alternate between communications networks and systems architectures, decision tools, and processes.

Initial exercises have progressively refined procedures and interoperability. For example, C²X One revealed that JMF-designated division headquarters need the standard C⁴I equipment normally apportioned on the corps level to act as force commander. Funding was identified for deployable global command and control system terminals and classified Internet routing network backbones. C²X Four tested the joint air operations center capability to create a common operating picture, use deployable video teleconferencing systems, and issue air tasking orders via a split Internet protocol configuration on the global broadcast system. Planning for C²X Seven was conducted with same-time Internet protocol-based voice and chat collaborative tools. This exercise will continue experiments with active bandwidth monitoring and control technology in support of Web centric information dissemination and knowledge management. These exercises continue to demonstrate the value of routinely testing, ensuring, and enhancing individual JTF unit capability to actually conduct command and control in expected crisis scenarios.

The barriers to connectivity between the JFCOM-designed and implemented standing joint force command and control element in regional commands on one side, and theater JTF



1st Combat Camera Squadron (Jeremy T. Lock)

service or functional component commanders on the other, can be eliminated by a worldwide C²X program. Deployable joint command and control is the solution for this element and is expected to provide standardized hardware and software for JTF-level command and control functions and support. Testing compatibility with permanent, transiting, or rotational component commands is imperative for interoperability. Draft requirements for deployable command and

control delineate a strategy for fielding technology. A global exercise program can facilitate technology induction as well as the coupling of command and control procedures in regional scenario vignettes.

The obvious winners of Millennium Challenge include the joint en route mission planning and rehearsal system near term as well as the joint



28th Public Affairs Detachment (Rhonda M. Lawson)

fires initiative. The former affords collaborative operating environment functions over international maritime satellite radio in airborne deployment operations. The latter has an integrated suite of situational awareness and knowledge-enabled tools to manage time sensitive targets. Inclusion of coalition partners in the global C²X program would facilitate multinational interoperability to include testing of PACOM-type combined operations wide area and Asia Pacific area network systems. The first encourages separate, simultaneous views of communities of interest while the second provides firewall-protected, multilevel access portals for posting and sharing information in a collaborative Web network.

Refine, Develop, Package

The third strategy led to the joint mission essential task list (JMETL), a unique document that delineates packaged, mission-oriented training standards common for JTF headquarters. Early JMF workshops postulated theater threat scenarios for 2003–2015 and identified the core missions that would constitute over 90 percent of the operations expected within the area of responsibility. Based on core competencies, specific missions were assigned to

three primary designated JTF headquarters: I Corps, Seventh Fleet, and III Marine Expeditionary Force.

Mission essential tasks with consolidated standards were derived from sample scenarios by the JTF staffs for forcible entry or foreign consequence

creating universal metrics could furnish quantitative measures for Joint Vision 2020 concepts

management. The joint mission essential task list was approved for immediate and mandatory use in all PACOM exercises and operations in 2001. It offers a basis for developing training objectives and articulating operational requirements. Command determination of specific criteria (the actual level of performance such as hours, days, or percentage) for standards, based on mission analysis, provides a benchmark for measuring unit performance. In the end, a performance matrix grades JTF headquarters readiness.

Mission-oriented tasks with criteria could be translated into measures of performance for evaluating the JFCOM standing joint force command and control element-related experimentation. Specific technological, organizational, or procedural initiatives would

be matched to key tasks such as command and control or fires, with corresponding criterion-derived metrics to evaluate initiative performance in theater-specific scenarios. Building on the PACOM approach, the Joint Staff is working on a set of joint capability descriptions for approval by the Joint Requirements Oversight Council. By analyzing military operations across commands and identifying an array of JMETL-based metrics, standards can be provided for the council to compare recommendations for change in doctrine, organization, and technology. Creating universal metrics for joint force development could furnish quantitative measures for *Joint Vision 2020* concepts and architectures. In addition, future warfare and crisis resolution attributes formerly identified could be both linked to tasks and assigned metrics to measure improvement.

Implementation will link joint command and staff planning and execution and address joint training. Deliberations on improving interoperability examined mandatory alignment of joint and service rotational readiness periods and multiple service training events but found them too difficult because of tempo, funding, and simulation limitations. New networked architectures could bring together forward JTF headquarters (such as Seventh Fleet) with distributed components at major training centers to perform high intensity, combat-related tasks such as fire support or battlespace maneuver. Simulation can augment live force shortfalls while exploring conceptual revolutionary platforms, such as cruise missile submarines, future combat system platforms, or advanced theater transport aircraft.

Integrating Experimentation

The fourth strategy modified PACOM training by integrating experimentation into exercises for evolutionary gains in warfighting. Mature near-term technology insertions could be evaluated for accelerated fielding at forward deployed headquarters. Experimenting while exercising leads to spiral technology enhancements that can aid seamless JTF operations. For example,

Patrolling Souda Bay,
Crete, Enduring
Freedom.



U.S. Navy (John Gaffney)

during Cobra Gold '02 in Thailand, conducted with III Marine Expeditionary Force as deputy combined task force headquarters, a number of technologies were exposed to operational scrutiny, with use of new procedures for JTF headquarters and JMETL standards (26 specific tasks).

To meet the challenge of C⁴ equipment and procedures in Cobra Gold, installation of the bandwidth monitoring and control system measured the volume of combined operations-wide area network applications and demonstrated utility to potentially control targeted applications, while the theater automated profiling system visually represented civil-military and information operations objectives through relevant vectors that provided progressive views of key battlespace metrics.

Against the challenges posed by a common operating picture, joint fires, and intelligence, surveillance, and reconnaissance, the installation of automated deep operations coordination system terminals enabled situational awareness and report visualization for Special Operations Forces. For the difficulties of common collaborative tools, the introduction of defense collaborative tool suite servers enabled NetMeeting chat, voice, and video collaborative sessions, with server etiquette and protocol. Exercise lessons revealed the

need for a formal process of assessing experimentation. Joint training and experimentation specialists assigned to each regional combatant command could assist in grading technology insertion capacity to achieve JMETL criteria, eventually enhancing implementation of the standing joint force command and control element concept, which is heavily dependent on emerging technology.

Operational Experimentation

These implementation strategies have achieved tangible advances in JTF speed, precision, and effectiveness primarily because they were developed and executed by warfighters who depend on JMF-related policies, procedures, and technology. Developing the SJC²E concept in exercises with real forces will assure headquarters activation and planning. Focusing on interoperability in complex tasks under difficult conditions will guarantee decisive action joint force execution. For example, the joint mission essential task list added responsibilities for examining doctrine linked to technology to integrate and synchronize fires and maneuver. Experimentation on procedures and technologies is needed to facilitate coordination of fire control measures

and gain better battlespace situational awareness in rugged terrain, urban jungles, and rural camouflage.

The PACOM approach to finding simple and practical solutions to interoperability problems and integrating them into exercises will better prepare operational forces. New technologies and processes must be balanced with service training requirements. However, warfighter endorsement of prototype joint experimentation will accelerate technology acquisition and procedural adaptation, paramount to ensuring joint preeminence. The spiral testing and fielding of initiatives in joint and multinational exercises, to include live fire events, will facilitate transparency and confidence among the joint and combined forces responsible for responding to a crisis.

Implementation strategies for the joint mission force highlight proven ways to prioritize, test, and field new capabilities. Efforts by U.S. Pacific Command to develop the prototype for the joint mission force headquarters confirm the value of the JFCOM standing joint force command and control element for interoperability. Future application of this element should facilitate rapid implementation across regional commands. Subsequent identification and correction of barriers to interoperability of the element through expanded national and global training and experimentation venues will assure the vital transformation of joint warfighting capabilities. **JFQ**



Stepping Outside

the Reality Box

Fleet Combat Camera, Atlantic (Michael Sandberg)

By MARK R. LEWIS *and* JOHN C.F. TILLSON

A system resembles a chain in that it is only as strong as its weakest link. Consider the example of defense transportation. Regardless of the capacity of aircraft and ships to carry military forces, system throughput will be limited if ports cannot handle what is debarked. A chain is strengthened by reinforcing the weak link; alternatively one could disassemble the chain, replace the weak link, and thus

make the chain stronger. It is futile to strengthen links that are stronger than the weakest link. Regardless of the number of aircraft and ships in the system, if the ports cannot deal with arriving troops and equipment, throughput will be limited.

Most DOD missions are performed by a system of systems in which each subsystem is an interlocking and interdependent process operating in concert with other systems and subsystems within their parent systems. They all come together to accomplish a task. Each subsystem plays a role in the overarching system, but none can complete the mission on its own strength alone.

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Transformation Goals

Planning guidance released in April 2003 called for U.S. Joint Forces Command (JFCOM) and the services to address six goals (and joint operating concepts) in an annual endeavor to produce transformation roadmaps. The Secretary of Defense established critical operational goals in the *Report of the Quadrennial Defense Review*, using roadmaps to focus on developing service-unique capabilities to:

- protect critical bases of operations
- project and sustain forces in distant anti-access/area denial environments and defeat anti-access and area denial threats
- deny sanctuary through persistent surveillance, tracking, and rapid engagement by high-volume precision strike
- assure information systems to conduct effective information operations in an attack
- enhance capabilities and survivability of space systems and supporting infrastructure
- leverage information technology and innovative concepts to develop interoperable joint command, control, communications, computers, intelligence, surveillance, and reconnaissance architecture and capability to include a tailorable joint operational picture.

To meet those goals, a service or agency can assume that each goal statement is a mission—a set of tasks and subtasks that must be accomplished in a structured way.

For instance, the essential task of the third goal is denying sanctuary to an enemy. Several tasks and implied systems are cited in the goal statement. Surveillance, tracking, and engagement systems are subtasks of the overall mission. Furthermore, there are implied tasks in each specified system that may use the output of other systems and subsystems or contribute to them.

Surveillance requires multiple systems of various components, both services and agencies, to provide continuous and near-complete information. To cover potential sanctuaries and furnish useful, timely information, this task will likely require multiple, complementary ground, sea, air, and space capabilities, which in turn call for separate commands and agencies to execute



48th Communications Squadron (William Greer)

discrete tasks in common. Every organization and the overall system must have both a tasking mechanism and a feedback loop to enable accurate assessment and responsive reengagement.

Similarly, acquiring targets is only one major task under the Quadrennial

describing the mission in terms of a system of systems identifies cause and effect

Defense Review. Intelligence systems must process information from surveillance systems, tracking systems must retain targets, engagement systems must be able to deliver the desired effect, and maneuver systems must be appropriately positioned in the battlespace. In addition, both combat support and combat service support systems must sustain operations. Denying sanctuary also requires complex interaction by these various systems.

The Weak Link

Once the six transformational goals are understood as missions executed through a system of systems, the next step is determining where to focus the effort to transform the larger system. Where is the weak link? Are there components that can be leveraged to increase the capacity of the

system? Can a component be bypassed or its output improved in other ways?

The concept that the six goals are missions performed by a system of systems that are only as adept as its weakest component exposes a flaw in the call to “develop service-unique capabilities necessary to

meet the six critical operational goals.” How can a service know where to

focus until it knows how its systems contribute to the overall mission? Moreover, how will DOD know how to allocate resources to reinforce the weak links?

System of Systems

Describing the mission in terms of a system of systems identifies cause and effect relations between entities in the system and allows commanders on all levels to monitor contributions to desired outputs. The areas ripe for breakthrough or transformational solutions are best found once these complex missions are presented as systems of systems. Then detailed analysis can find the weak links—or the hidden potential in the system.

The challenge of diagramming complex missions is not limited to

Cargo awaiting transport, Dover Air Force Base.



1st Combat Camera Squadron (Dominic Hauser)

identifying the system of systems. The web of relationships linking tasks and systems must be perceived in enough detail to enable understanding that a change in one dimension may resonate throughout the system. Only when processes, subsystems, and relationships among them are identified can the overarching process be traced to find constraints inhibiting mission performance. Problems can be associated with hardware, resources, organizations, policy, or doctrine. Choke-points that impede the system can indicate problems that cannot be resolved normally and call for transformational solutions.

Sometimes commanders do not have needed technology or resources. For example, night vision devices represented a breakthrough that denies sanctuary in darkness. Suddenly an enemy could be seen at night, boosting capability and effectiveness.

At other times the problem is organizational. The Goldwater-Nichols Act sought to change the way that the defense establishment does business. By strengthening the operational chain of command and eliminating stovepipes to enhance jointness, this law overcame friction between unified commanders and the services.

Operational concepts also pose problems. France invested significant resources in the Maginot Line during the interwar years without resolving the fact that defensive barriers can be breached or avoided. It was faced by the demands of a fortified force versus a mobile reserve. Failure to resolve this tension, rather than technology, which was at least on a par with that of Germany, led to defeat.

Problems can exist in many dimensions—technology, organizations, and policy as well as operational concepts and doctrine. Once the system of systems is understood, the effort shifts to finding problems that restrict the potential or opportunities to enhance capability by restructuring it. Its problems are identified. The challenge is eliminating those things that inhibit the performance of the overarching system, clearing the way for transformation.

The Reality Box

With mission statements diagrammed, the primary issue is finding problems in the system. Surveying decisionmaking processes is the point of departure in creating a methodology to identify breakthroughs. The processes are ways to think about solving problems presented by a mission statement and discovered in mission analysis.

Each conventional solution-seeking process entails mission analysis that describes assumptions, limitations, and problems or constraints that bound the range of solutions.

Because such methods include operational risk assessments, they are conservative and take identified limiters as a given. Although some attention is paid to replacing assumptions with facts, the primary aim is identifying limiters to planning with complete situational understanding. Thus the processes are not designed to produce transformational solutions, but instead point to the most effective course of action while minimizing risk. That is reasonable in the context of operational planning, and it almost always generates a conventional solution.

In identifying facts, limitations, constraints, and assumptions, current processes define the reality box in which a solution might take shape. The effort is focused on defining the dimensions. If one conceives of the solution as a sphere and the reality box as a cube, the task becomes stuffing the largest possible sphere into the cube. The result is either the largest possible reality box (which is desirable because the bigger the box, the bigger the sphere that fits inside) or fitting a solution into a constrained reality box (which means effectively using all available resources). The existence of such a box, however, is rarely questioned or even recognized.

The reality box concept is related to outside-the-box thinking but is not identical. The term *outside the box* has come to mean unconventional approaches to solving problems. Supposedly its origin is a parlor game that presents players with nine dots arranged in a 3 by 3 square. The object is connecting nine dots with four straight lines without lifting the pencil from the paper. The only solution is drawing lines outside the box. Today the phrase is used as a hortative: *think outside the box*. But it rarely offers direction—it simply means considering alternatives. Such thinking can be unguided and result in plans that drift in white space. Any breakthroughs would be serendipitous. Hence the need for the reality box concept to direct efforts toward transformational solutions.

Vehicles arriving in Kuwait, Iraqi Freedom.



1st Combat Camera Squadron (Tammy L. Grider)

The image of a solution stuffed inside a reality box enables the visualization of concepts of potential and friction in the context of developing breakthroughs. The space between the solution sphere and the box represents potential; the sphere has room to grow before it contacts the limiting box walls. The task of conventional planners is fitting a solution sphere into that space defined by the box. Expanding the sphere as far as possible represents a qualitative refinement of the solution within the limits discovered through mission analysis.

Similarly, points where the solution sphere makes contact with the inside of the box can be understood as problems that hamper system performance; the solution sphere wants to expand but is constrained. Those points of friction are generally regarded as an unmovable part of the box and efforts usually turn to expanding the sphere into empty spaces. When every option for developing a solution to fit inside

the reality box is exhausted, some limiters must be relaxed enough to allow expansion for the solution to fit. That might mean requesting added resources to use in mission accomplishment, redefining the mission objective, or rethinking the level of risk acceptable. The result is that the reality box is stretched to enable the solution

by definition, transformational solutions fall outside the reality box

to fit inside the box. This effort will not cause breakthroughs because it does not fundamentally alter the way solutions are shaped.

A distinction can be made between conventional problem solving and a method that might produce a breakthrough. Instead of accepting the limitation, transformational solution seekers look at points of contact to determine the nature of the constraint. Is the sphere rubbing against an actual limiter or merely the fabric of assumptions covering holes between facts? Is the point of friction vulnerable to

puncture? Are the facts really facts, or are they assumptions? By definition, transformational solutions fall outside the reality box. This is the nature of a breakthrough; it penetrates limiters that box in solution sets.

Even though processes like the joint operation planning and execution system or the Army decisionmaking process may not lead to transformational solutions, they may be a reasonable start in building the reality box. This step is critical because it offers an exquisite definition of reality. Ultimately what one does with the completed box is what distinguishes transformational solution seeking from conventional decision-making processes.

Identifying Assumptions

Care is taken to identify assumptions on the situation and environment in mission analysis. An assumption is a statement or condition accepted as valid without any substantiation or proof. It is a supposition

Tactical automated sensor system, Iraqi Freedom.



1st Combat Camera Squadron (Matthew Hennen)

Underlying reasons are lost as assumptions pass down the chain. Soon they become facts. Similarly, policy constraints take on a life of their own. Sometimes unbreakable rules arise for lack of focus on the overall system, which reinforces the need for a systems diagram that enables planners to trace undesirable effects in the system to an original conflict and to judge the validity of the assumption.

Windows of Opportunity

Transformational solution seekers, unlike planners, think that holes in the box are windows of opportunity. Covered only by assumptions, these are points where the box becomes vulnerable to breakthroughs. When assumptions are identified, addressing them is a straightforward process. If the source of conflict is clear and the choice deliberate, organizations can weigh options, make informed decisions, then adopt ways to mitigate the consequences.

Transformational solution seekers look specifically for assumptions that can be broken with transformational solutions. The box represents reality, but conditions that define reality—political, social, economic, military, and other factors—are complex adaptive systems that change human and environmental interaction. Indeed, technology develops and scientific understanding evolves. Thus the bases of assumptions constantly change. According to one analyst, “Assumptions that were valid yesterday can become invalid and, indeed, totally misleading in no time at all.” Thus, while the next phase is beginning to generate solutions that fit in the reality box, the transformational solution begins by identifying assumptions.

If assumptions are identified, the challenge is straightforward. Unfortunately, it is not easy to identify assumptions that point to transformational solutions. Planners need a different way to locate assumptions to break. First, they must understand the system of systems so the web of tasks, organizations, and relationships that interact to accomplish the mission becomes clear. Today this web of interaction takes place within the reality box,

about current or future situations held to be true that replaces the unavailable facts. Identifying assumptions is vital in planning and pivotal in military transformation.

Valid assumptions combine with facts to become the framework that shapes the reality box. The structural integrity of the box is relevant to planners. From their perspective, holes are windows of vulnerability through which an unforeseen event could compromise the solution. Thus as the box

takes shape, planners naturally seek to identify holes and plug them. At first they use assumptions, replacing them when they acquire facts.

In dealing with recognized assumptions, facts must be scrutinized. Often they are deeply held convictions whose basis is not understood. Hidden assumptions are insidious because they take considerable effort to expose. Constraints may be based on assumptions that are seemingly unbreakable rules. Commanders are advised in Joint Pub 5.00-1, *Joint Doctrine for Planning*, to consider “assumptions handed down from higher echelons as facts.”

OH-58 crews,
Iraqi Freedom.1st Combat Camera Squadron (Tammy L. Grider)

and problems that limit the ability of the system can be seen as points where the system meets the box. Problems can arise from conflicts over choices regarding policy, organization, doctrine, technology, or resources. Thus the next step for transformational solution seekers is using the reality box to identify problems in the system and then focusing analysis on them.

Analytical Tools

Most management concepts deal with transforming corporations, but they offer little insight into the process. Among them is the theory of constraints, which began as a technique based on scientific method that could be applied to industrial production. It developed into an approach for analyzing organizations to address

problems that hinder attaining organizational goals. Simply put, this theory provides analytical tools to answer three questions:

- *what to transform*—causes of problems faced by organizations and systems, conflicts that prevent eliminating problems, and explicit and implicit assumptions underlying conflicts
- *what to transform to*—changes that resolve problems and facts that can replace or modify faulty assumptions
- *how to achieve transformation*—obstacles to change, finding means to overcome them, and taking the necessary steps.

The first step is identifying problems that affect organization. Once identified, the theory of constraints facilitates the recognition of assumptions, policies, practices, and measures that cause them. To remain abreast of evolving reality, one must identify what to change. Then, in deciding

what to transform to, the theory offers a technique for deciding changes in policies, practices, and measures. Finally, it provides a way of deciding how to transform.

Military transformation calls for breakthroughs in problems confronting the Armed Forces. Operational goals should be regarded as mission statements that describe a system of systems. The services bring unique capabilities to these goals, but they interact within the context of a larger system. Thus the system must be diagrammed in a manner that illustrates its constraints across the defense community. Developing transformational capabilities without such an understanding runs the risk of suboptimizing or squandering resources. **JFQ**



Information Operations

Joint air operations center, Millennium Challenge.

99th Communications Squadron (Molly Gilliam)

and Millennium Challenge

By MARK W. MAIERS *and* TIMOTHY L. RAHN

Millennium Challenge, a joint exercise hosted by U.S. Joint Forces Command (JFCOM) in summer 2002, examined how far the Armed Forces could go in implementing *Joint Vision 2020* and executing rapid decisive operations within this decade. One goal was to develop recommendations on doctrine, organization, training, manpower, logistics, personnel, and facilities. Exercise live play

was focused on operational net assessment, identifying critical nodes, the range of options, second- and third-order effects, and unintended consequences. The services mounted live actions with combat assessments and employed effects-based operations to pursue experimentation goals.

From the outset of the exercise it was apparent that information operations could produce decisive effects in the fight. These efforts integrate military deception, psychological operations, electronic warfare, operational security, and computer network operations. They affect the enemy information environment while not affecting

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friendly audiences. Ultimately, these operations seek to influence enemy decisions and opinions in ways favorable to national objectives.

Another goal of the exercise was integrating information operations in rapid-decisive and effects-based operations constructs to gain and maintain information superiority. The concept of operations was the initial step in the experiment and adhered to current doctrine. It involved testing the standing joint force headquarters (SJFHQ), which provided combatant commanders with a trained, equipped, and permanently constituted joint organization. This headquarters was intended to reduce lag time for setting up a JTF headquarters to conduct operations. Once the exercise began, the staff was augmented to form a cross-functional

there was no national doctrine, strategy, or process promoting integrated information operations

body composed of five groups: operations, plans, information superiority, information/knowledge management, and a command element, which worked without formal or informal barriers.

Thus information operations supported the joint task force in an environment heavily reliant on information and information systems. Both were meant to increase knowledge of an enemy and to protect command and control and situational awareness. Information superiority is achieved by negating enemy capabilities until the Armed Forces dominate the information domain without effective opposition.

Most information operations staff members were part of the information superiority group. Primary duties under the original concept were synchronizing information operations, maintaining the operational net assessment, developing the effects tasking order, integrating information effects into the overall mission, assessing the effects of information operations, and identifying intended and unintended enemy reactions. The

staff worked with organizations external to the joint task force to accomplish these tasks.

Growing pains appeared as the exercise progressed. It became clear that the information portion was not vigorous enough to gain and sustain information superiority. As such, operations directly reflected the situation in the defense establishment. Capabilities are not well understood by all planners and leaders. There are disparate service centric information operations capabilities, with little agreement on how they should be used together in support of joint operations. During the exercise, Joint Pub 3-13, *Information Operations*, was in the process of rewrite, with over 200 critical comments on the first review. DOD Directive 3600.1, though not yet published, was in its seventh revision. The services and U.S. Special Operations Command were responsible for tactics and doctrine, JFCOM for testing and experimentation, and U.S.

Space Command for computer network defense and attack. The information operations study that Defense Planning Guidance directed was not yet complete.

Setting the Stage

As exercise planning commenced, there was a lack of overarching national policy, with no national doctrine, strategy, or process promoting integrated information operations. The interagency coordination and approval process was geared to separately established Presidential directives concerning functions such as contingency operations and critical infrastructure protection. SJFHQ and the component commands did not have enough trained and experienced personnel to conduct full spectrum information operations. Inadequate resources existed for producing effective perception management results such as integration of cultural intelligence, psychological operations (PSYOP), public affairs, and civil affairs. There was insufficient intelligence support for technical options in conducting a computer network attack and for integrating and conducting operations with coalition and allied information operations players. In addition, there was a need to

ease and streamline the restrictive security accesses for existing capabilities.

The need to fix information operations is understood on the national level. Requirements and instructions for military information capabilities are clearly and consistently outlined in recent defense guidance as follows:

- Operations will be synchronized with multinational and interagency partners as required.
- Information operations may evolve into a separate mission area requiring the services to maintain appropriately designed organizations and trained specialists.
- The ability to conduct information operations has become a core DOD competency.
- It is imperative to maintain an unsurpassed capability to conduct information operations.

The Challenges

Millennium Challenge provided a test for finding solutions to the challenges of information operations. Given a near-peer competitor and the requirement to conduct rapid decisive operations in the future, how can actions be measured to determine when information operations are effective? Many believe information superiority, like air superiority, can be gained only for limited periods, so a reliable way of measuring success is needed. Comparing measures of performance and effectiveness offers a way of identifying when windows of information superiority exist.

It became obvious during the exercise that the organization was inadequate for information operations. Functional aspects were dispersed with no one commander coordinating activities, and information operations were only partially represented by the joint psychological operations task force, which is equally important to plans and information superiority. Early in the exercise the JTF commander recognized information operations as a capstone element of combat power both in the lethal and nonlethal sense.

Information operations cell. The organization combined enabling effects, guidance/intent, and the critical information requirements list in the information operations part of the effects



U.S. Air Force (John Houghton)

Launching Dragon Eye,
Millennium Challenge.

tasking order. It was not envisioned as an annex or stand-alone plan, but as an integration of operations across the priority effects list that components use in developing plans in support of the order. The assessment process would be critical and should be driven by the objectives of JTF commanders and not exclusively by a list of effects.

Network analysis. Future cells must be furnished with suitable analytical products. A full network map of the communications architecture and complete analysis of the regional infrastructure should be primary tools in understanding enemy targets. Additionally, strategic influence analysis modeling of political and economic networks is needed. Only partial versions of these products were available as separate networks in the exercise, with no initial analysis on how they were interconnected. Subsequent targeting analysis by the joint force air component commander, combined air operation center, and JTF joint intelligence support center were not synchronized. The combined air operation center used the Telescope system, while the joint intelligence support center relied on the Adversary software tool. The latter performed marginally,

resulting in attrition as opposed to targeting the systems that had the most bang for the buck.

Defense information operations. The exercise focused almost exclusively on the attack and exploitation capabilities of offensive information operations; little defense was played. There was minimal cyber event reporting and none in the joint operational area.

few defensive information operations were built into the exercise design

Similarly, red forces made only a slight effort to dazzle and jam space assets. Future JTFs must consider the reality of the threat to networks, nodes, and transmission centers. During the exercise, asymmetric attack on friendly operations was unrealistic compared with the scope of the simulation.

While few defensive information operations were built into the exercise design, the cell did work on defensive issues. It tracked trends in analyses of friendly networks, communication

nodes, and outside influences on the joint task force.

Cyberwolf. Computer network attack activity in blue force systems and subsystems was measured using Cyberwolf. The software had the desired effect by getting organizations to change information conditions in the theater. It identified network scans and potential intrusion, but it was not the only indicator. It was adequate only when combined with information external to the serviced network. Cyberwolf was a qualified success. Injects were limited to the first phase of operations prior to H hour. They sensitized the JTF staff to a dependence on digitized information handling and highlighted the fact that a change in information conditions impacts, but is not understood by, mid and upper levels of leadership. Every component has the authority to change the conditions, normally in concert with joint task force computer network operations, which maintains a common operating picture. In Millennium Challenge, components changed conditions without consulting outside organizations or considering the global ramifications in a stressed environment.

The relevance of information conditions in this exercise, where information workspace was the primary means of JTF command and control, reveals that the entire process should be reviewed and synchronized. During the exercise, workspace used the secret

Internet protocol router network (SIPRNET) without a redundant system. Disconnecting systems, as required under informa-

tion condition Charlie, is not an option. Commanders will face this same problem in the future should an enemy find the means to degrade friendly databases, nodes, and transmission capabilities.

Space and Information Operations

U.S. Space Command provided a space and information operations element on the level of the combatant commander during Millennium Challenge to give enhanced support to rapid-decisive operations, effects-based operations, and operational net assessment. It contributed personnel and



Joint enroute mission planning and rehearsal system-near term.

1st Combat Camera Squadron (Lisa M. Zinzany/Kea)

supported the information operations cell, which must be available in every JTF operation. In the near term, information expertise should be provided to combatant commanders from the relatively small pool of expertise in DOD. However, expertise will eventually need to become resident in the commander's staff to provide full integration into both deliberate and crisis planning.

External organization support. Centers of excellence were mentioned frequently during the exercise, but their capabilities were not drawn upon. Agencies could reasonably be expected to be available over SIPRNET, but private sector resources such as educational institutions would not in a classified scenario. Furthermore, posing specific questions would violate operational security. Connectivity with agencies such as Joint Warfare Analysis Center, Joint Information Operations Center, joint task force computer network operations, 1st Information Operations Command, Fleet Information Warfare Center, Central Intelligence Agency, and Defense Intelligence Agency would have

proven invaluable and should be part of future JTF operations.

Analysis tool development. Current information operations doctrine and most of the tools that supported planning involve a mechanical, stovepiped approach based on the joint operation planning execution system. Information operations do not fit that mold. Analysis of the problem of isolating unfriendly command and control yielded various methods by which an enemy obtains information and makes decisions. The information operations staff evaluated physical contacts, the electromagnetic spectrum, hard copy media, and intelligence apparatus. The associated nodes were identified, which eventually linked to the targets necessary to focus on a specific enemy capability. The team avoided stovepiping in its approach to the problem, resulting in integrated and synchronized solutions. The development of this formal approach to analysis of the information environment will be critical to future JTF operations.

Spectrum analysis and deconfliction. A requirement for a joint restrictive frequency list or spectrum manager was identified early in the exercise. A joint force air component commander

had nominal responsibility as part of the real-world live fire portion. However, an analysis of the total radio frequency spectrum was needed to identify the part the enemy was using and the part JTF was using. The information operations cell conducted an initial analysis but could not gain sufficient intelligence to create a viable tool for attacking or exploiting enemy use of the radio spectrum. The ability to understand, exploit, deny, and protect across the full range of frequencies must be considered in future exercises, experiments, and real world events.

Technical Skill Sets

Manning information operations cells is a challenge. During the exercise the cell had electronic warfare specialists from the Navy and Air Force, a PSYOP officer, two computer network operations planners (a marine and an airman), but no dedicated planners for deception or operational security. In addition, there were no dedicated targeters or intelligence support personnel. All operators were specialists in information and service-specific capabilities, but few had significant backgrounds, and all had difficulty understanding the larger concept. This problem will persist until the services further develop career patterns for planners. Key personnel and skill sets are required for SJFHQ and information operations components:

- information operations specialists who have expertise in areas such as electronic warfare and computer network operations and a general understanding of information capabilities and centers of excellence that can provide in-depth analysis for planning
- planners able to use information operations in support of the overall JTF plan, understand their capabilities and application on the national level, and develop measures of performance and execution
- special technical operations planners who understand technical operations capabilities and how they can support information operations
- intelligence analysts who specialize in intelligence but grasp the requirements for planning, executing, and assessing information operations
- system of systems analysts who are experts on the operational net assessment database and have sufficient knowledge of

information operations to support planning and analysis activities

- effects assessors who can evaluate the effectiveness of information operations both generally and in relation to the overall plan.

There are five core capabilities of information operations divided into two camps. On one side are technologists, who provide electronic warfare and computer network attack/defense to affect the electromagnetic spectrum and information systems. On the other are humanists, who conduct PSYOP, military deception, and operations security to influence foreign decision-makers and protect friendly decision-makers. Unifying both groups into a single core of specialists is key to understanding the capabilities that must be integrated on all levels of warfare.

A Joint Task Force

One important observation in Millennium Challenge was the requirement on the part of the blue force for a central coordinator on the JTF level. Only PSYOP was addressed formally on the command level by the joint psycho-

information operations were not completely integrated into the overarching JTF plans

logical operations task force. During the exercise, information operations achieved component-level status with respect to responsibility but lacked the resources and authority to be genuinely effective. Functional aspects were dispersed. Because information operations were part of the information superiority function, they had no direct representation at the table and were not completely integrated into the overarching JTF plans, and thus were not fully leveraged for expertise and use. The after action report noted that senior exercise mentors, the joint task force commander, and the combatant commander all agreed that information operations needed a centralized commander to coordinate activities on

the JTF level. A joint information operations task force (JIOTF) would fill this need.

Two concepts are essential in considering information operations on the JTF level. First, combatant commanders must have a strategy in place, clarify the JTF role in achieving the strategy, and accept the strategy as critical to objectives. Second, the role of information operations cannot be simply an afterthought addressed immediately before a conflict. Shaping and influencing activities must occur continuously throughout peace, crisis, and combat. It is almost impossible to change a popular negative view of JTF efforts once shots are fired.

Organization

The need for JIOTF as part of a JTF staff is critical to establish and maintain the knowledge superiority needed to execute rapid decisive operations. Lessons from Allied Force and Enduring Freedom together with observations from Millennium Challenge underscore the need to solve this challenge. Lingering Cold War mentalities still generate operation plans focused on brief, single-dimension combat in which deception, diversion, and feint opportunities are lost. JIOTF should be based on plans and operations. The focus must be on enabling the lethal and nonlethal capabilities of information operations for joint warfighters.

Future experiments should address the need to organize a joint information operations task force to focus on information operations as an element of combat power. The task force would be constituted by members of combatant command staffs, augmented by information operations assets from U.S. Strategic Command as required. The responsibilities of the JIOTF commander would include assisting CJTF planning for information operations, monitoring execution of specific actions, and assessing measures of performance and execution.

Millennium Challenge revealed the important functions that JIOTF brings to the table because the JTF commander recognized information

operations as a key element of combat power. The information operations supervisor was a primary staff position with functional responsibilities that included:

- furnishing CJTF with information operations optimized to furnish planning, coordination, integration, and synchronization across the spectrum of conflict
- spanning the CJTF joint operational area with a process harmonized across agencies and services, capable of providing support to other agencies in their missions
- providing a focus for information operations in every medium (land, sea, air, space, and information)
- focusing the command on translating information operations from an enabler into a fully integrated capability
- providing CJTF and component commanders with capabilities, limitations, and employment considerations (second- and third-level effects) to employ information operations.

Millennium Challenge highlighted challenges and areas for future experiments and games. According to the JTF commander, information operations are a “capstone element of combat power . . . both lethal and non-lethal. . . . We must condition the world to accept [information operations] as an essential element.” Anyone with responsibility for conducting such operations must have the requisite authority and assets. Because the operations form a component of joint warfighting that remains in a gray area, there is a gap in its effective employment. The challenge is bridging that gap and bringing the full potential of those capabilities to bear against enemies. **JFQ**



Manpack terminal,
Enduring Freedom.

55th Signal Company (Jeremy Colvin)

Ground Radar Surveillance and Targeting

By PRICE T. BINGHAM

Developing the capability to quickly defeat an enemy on land, with fewer and more agile forces, is a significant challenge for the military. Desert Storm, Allied Force, Enduring Freedom, and Iraqi Freedom involved severely punishing or defeating enemy

ground forces. Although many thought those operations would require a large number of heavily armed troops in close combat, logistic difficulties and the concern over casualties made such operations unsuitable in three of the four conflicts. Those realities will likely have an even greater impact in the future because of the threat of anti-access capabilities and weapons of mass destruction.

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Scud missile bunkers,
Desert Storm.

U.S. Navy

Military transformation is feasible in part because of wide-area, high-performance ground moving target indicator (GMTI) radar capabilities. Today the E-8 joint surveillance target attack radar system (JSTARS) of 116th Air Control Wing is their principal source. Various systems will offer such capabilities in the future including Global Hawk unmanned aerial vehicles, B-2 bombers, F-35 joint strike fighters, F/A-18E/F and F/A-22 aircraft, aerial common sensors, multi-sensor command and control aircraft, and space based radars.

Ground radar disrupts and dislocates enemy forces through the integration of maneuver and standoff attacks. Using these means rather than mass and attrition can transform war by making it possible to defeat land forces quickly and decisively with fewer and lighter forces while reducing risks to military and civilian personnel. Despite this potential, use of E-8 ground radar systems in recent conflicts reveals obstacles that will require a transformation in training.

Enabling Transformation

Ground radar can enable military transformation because almost every army, even primitive forces such as the Taliban, relies on vehicular movement for offensive and defensive operations. Before the massive and heavily mechanized Easter offensive by the North Vietnamese in 1972, their operational

JSTARS is unique in its ability to turn reliance on vehicular movement into an information advantage

effectiveness depended largely on logistic support along the Ho Chi Minh trail. Commanders have used movement to gain advantages in force ratios, position, and surprise, but during the 20th century most armies came to rely on motorized vehicles. Today that dependence is greater than ever. Vehicles furnish not only mobility but heavy firepower, armored protection, and logistic and engineering support. And with the capability of the Armed Forces to precisely attack fixed targets, vehicles such as missile transporter

erector launchers are being used increasingly to improve survivability.

JSTARS is unique in its ability to turn reliance on vehicular movement into an information advantage in both peace and war. With ground radar, the system can reliably detect, accurately locate, and precisely track vehicles from a significant standoff distance within a large coverage area even in darkness and bad weather. It can identify vehicles being tracked. Data on movement can be used to cue unmanned aerial vehicles with high-resolution but limited fields-of-view electro-optical/infrared sensors. This information, especially when collected over days or weeks and used as the context for integrating other forms of data, can provide unprecedented situational awareness of threats and opportunities.

If a vehicle being tracked by ground radar is identified as hostile, the E-8 crew and capable communications make it possible to exploit this real-time information by supporting air and missile attacks before the vehicle can threaten friendly forces. In a development with major implications for such targeting, tests in the affordable moving surface target engagement program have shown that ground radar information can be used in guiding seekerless weapons in standoff, all-weather attacks against moving vehicles. This capability, applicable to the

joint direct attack munition and missile systems, could reduce civilian casualties, collateral damage, and aircraft losses. Moreover, precise strikes on vehicles in all weather from standoff ranges might inhibit an enemy from risking militarily significant movements.

Perhaps the transformational importance of radar ground surveillance and targeting such as the affordable moving surface target engagement program can be appreciated by recognizing the limitations that faced the Armed Forces before those capabilities existed. Available sensors in the form of human sight and cameras could locate moving vehicles but only at short ranges and in daylight and fair weather. Commanders were thus denied situational awareness on the location, movement, and strength of

enemy forces. Fighter bombers on armed reconnaissance sorties provided the only means for detecting and targeting individual vehicles before they could engage in close combat.

Unfortunately, armed reconnaissance has proven inefficient and often ineffective in finding and attacking mobile forces. The limited fields of view of a fighter-bomber pilot was one reason armed reconnaissance fell short. Limited vision made it necessary to fly many sorties to search a large area for vehicles. It also made it necessary to search at low altitudes where an aircraft was exposed to short-range air defenses. Even when many sorties could be flown and the losses from air defenses were acceptable, operations in World War II, Korea, and Vietnam demonstrated that armed reconnaissance failed to locate and attack suitable targets. Camouflage, concealment, and deception often caused fighter-bombers to miss suitable targets or attack invalid ones like decoys or previously destroyed vehicles. More importantly, enemy land forces were able to reduce the risk of detection and attack by moving during darkness or bad weather.

The inability of the Air Force to find and target vehicles before they approached friendly land forces helps explain why it was necessary until recently to find opposing land forces through contact with friendly land forces, why until then victory depended on close combat, and how that created its own problems. Prevailing in close combat usually called for heavy land forces, which led to concerns over casualties. Deploying those forces also required significant time and resources. However, radar ground capabilities provide effective and efficient alternatives to relying on both close combat and visual armed reconnaissance.

With the development of the affordable moving surface target engagement program, high-performance ground radar surveillance and targeting systems are transforming operations against armies much as radar did

against air forces. Radar made it possible to detect, locate, and track aircraft flying in a large airspace even when light and weather were poor. As early as the Battle of Britain, where radar provided unprecedented wide-area situational awareness, the use of maneuver by the Royal Air Force to engage or avoid enemy aircraft was enhanced and the danger of surprise was reduced. When radar was applied to weapons, it became possible to precisely target aircraft from a significant standoff distance in both darkness and bad weather.

Today ground moving target indicator radar offers similar capabilities against vehicles that move over a large area. In contrast to air warfare, however, only U.S. and allied forces (several European nations and NATO members) have these high-performance systems. Moreover, even if an enemy obtained such technology, it would not gain an advantage because the effective operation of the systems, unlike radar against air forces, requires an air- or space-borne platform, and the Pentagon can deny the ability to operate such a platform. Yet despite the immense potential of ground radar for transforming operations, a review of recent conflicts reveals that realizing it has been slow. Iraqi Freedom is not addressed here, but early reports indicated that fully utilizing radar surveillance and targeting capabilities remains a problem. Some personnel

manning the Combined Air Operations Center were reportedly unfamiliar with the system.

The Gulf War

Because JSTARS was intended to counter the Warsaw Pact, many believed that it was no longer needed with the end of the Cold War. However, the employment of two prototype E-8A aircraft during the Gulf War quickly proved otherwise. During their attack on Al-Khafji only two weeks after the system reached the theater, the Iraqis learned that they could no longer assume that moving at night protected them from detection and attack. E-8A ground radar made it possible to locate enemy units and target them with devastating air strikes before they could close with Coalition forces. In addition to enhancing the efficiency and effectiveness of air attacks, many deep within Kuwait, the system helped Coalition leaders understand that the Al-Khafji attack was not a feint designed to mask a larger offensive.

During an offensive in some of the worst weather of the war, E-8A ground radar quickly revealed enemy efforts to reposition their forces, providing advancing Coalition land forces with information to defeat the Iraqi maneuver before it became a serious threat. When the Iraqis began pulling out of Kuwait, GMTI radar surveillance indicated that a large-scale withdrawal

Desert Storm

The United Nations called on Iraq to withdraw its invasion forces from Kuwait in August 1990. Then, in response to requests by Saudi Arabia, the United States formed a coalition and sent troops to the region. The United Nations authorized the use of force if Iraq did not withdraw by mid-January 1991. Coalition forces of some 700,000 were fielded by January 1991, including 540,000 Americans. Desert Storm commenced on January 17 with airpower focused on enemy air defenses before turning to infrastructure, oil refineries, and military targets. The ground offensive began on February 24. Kuwait City was liberated in three days and the operation ended after only 100 hours. Although no official statistics exist, the estimated level of Iraqi forces in theater ranged from 180,000 to 630,000 with 8,000 to 100,000 casualties. In contrast, the Coalition lost only about 300 troops. A Security Council resolution in April required Iraq to destroy or render harmless its chemical and biological weapons, halt its nuclear weapons development, and eliminate its ballistic missiles with a range greater than 150 kilometers.

JFQ

had begun and provided targeting data to support air attacks along the so-called Highway of Death. Despite the description of attacks on that escape route, relatively few Iraqis were killed there; throughout the war they rarely stayed in place once their vehicles were targeted. Moreover, had the ground offensive not been suspended after only 100 hours, surveillance and targeting support might have played a major role in preventing Republican Guard divisions from escaping intact.

Ground radar surveillance and targeting contributed to Desert Storm by defeating enemy land forces despite major handicaps. One was that only two prototype systems were available, and they did not reach the theater until just before the air offensive. However, thanks to heroic efforts by the

JSTARS was not used to its full potential to help target mobile Serbian land forces

JSTARS team, composed of military and contractor personnel, one of the two systems flew every night of the war. But with only one system airborne and only at night, it was impossible to provide continuous ground radar coverage. Consistency was further reduced because commanders had urgent requirements across the theater for its unprecedented system capabilities. E-8As were often tasked during a single mission to conduct surveillance from the far west of Iraq (to look for Scuds) to the border between Kuwait and Saudi Arabia (where the Al-Khafji attack took place).

Since the system was still in development during the invasion of Kuwait, another handicap was widespread unfamiliarity with JSTARS. As the joint force air component commander noted, "We who were responsible for planning and orchestrating air operations had little appreciation of the system's capabilities and limitations."¹ Lack of familiarity extended to crews, which had to be trained while the systems were en route to the theater.

Even the concept of operation had not been fully developed. But thanks to the ability of the JSTARS team to refine

the system during combat and explain its capabilities, the Coalition quickly exploited advantages in ground surveillance and targeting.

Kosovo

In the case of radar ground surveillance and targeting, Allied Force did not begin where Desert Storm left off; JSTARS was not used to its full potential to help target mobile Serbian land forces. To some extent the failure to exploit the system from the outset of hostilities can be explained by major differences between the conflicts.

Unlike the terrain in Kuwait and southwestern Iraq, which is relatively flat desert, Kosovo is mountainous with heavy foliage that increased screening and made it more difficult for E-8A ground surveillance to detect,

locate, and track mobile forces, especially from the orbit assigned to the system. Another difference was that Ser-

bian forces faced little immediate danger from a land force. Thus they had scant need to move to develop advantages in mass, position, and surprise. By remaining dispersed they could avoid providing the large number of lucrative moving targets JSTARS detected in the Gulf War.

The lack of enemy land forces contributed to the failure of NATO to perform intelligence preparation of the battlespace until it was too late. Currently, only land components make such preparations. Task Force Hawk, the deployment of two battalions of Apache and other helicopters together with infantry, tanks, artillery, engineer, and headquarters assets, provided NATO airmen with expertise in

developing the ground order of battle, which significantly aided the employment of airpower.

Civilians the Serbs used for protection were another factor. Their presence led NATO to require positive visual identification before attacking targets to reduce harm to noncombatants. Operations revealed that ground radar surveillance could play a valuable role in target identification by providing cues to airborne forward air controllers and operators of unmanned aerial vehicles on locations where movement was occurring. JSTARS, Rivet Joint, forward air controllers, C-130 command and control aircraft, U-2s, and Predator unmanned vehicles were all linked. These cues made forward air control and unmanned aerial vehicles more efficient since targeteers did not have to conduct the initial search for movers using limited fields-of-view sensors.

Another difference was the impact of basing on JSTARS employment. Swiss and Austrian refusal to allow overflights required E-8s to fly a long distance to reach an orbit from their base in Germany, which reduced on-station time and increased air refueling.

Similarities to the Gulf War also limited the initial contribution of the system. Even though JSTARS was no longer a prototype, the fleet consisted of only four operational systems; thus for most of Allied Force only two systems were deployed in theater. But, as in Desert Storm, the team excelled in generating sorties between February 22 and June 28, 1999, flying 83 sorties for a total of 730.7 on-station hours. Yet even with this level of effort, the

Allied Force

After the failure of negotiations at Rambouillet in March 1999, NATO launched an air campaign designed to compel President Slobodan Milosevic of Yugoslavia to end abuses against ethnic Albanians by Serbian forces in Kosovo. Air strikes continued for 78 days and were halted in early June when Milosevic acceded to NATO demands to withdraw from the province. The Alliance generated over 38,000 combat sorties without any combat losses in the largest operation in its history. Allied Force was the third largest strategic application of U.S. airpower since World War II at the time, exceeded only by the Vietnam War and Desert Storm.

JFQ

JSTARS landing,
Iraqi Freedom.



116th Air Control Wing (Tom McKenzie)

limited number of aircraft and the distances involved prevented JSTARS from providing 24-hour coverage, which allowed Serbian forces to move without the risk of being detected, located, or tracked by radar.

A further similarity to the Gulf War was the lack of familiarity with system capabilities and limitations on the part of those responsible for air operations. That may explain why JSTARS was not deployed early in the crisis when vehicular information could have revealed the magnitude of the Serbian deployment. Once deployed, unfamiliarity also contributed to delays in including the system in the air tasking order and to placing the system in a less than ideal orbit. Choosing orbits for surveillance of rough terrain requires special software to ensure that the screening of key areas such as road segments will be minimized. Lack of familiarity caused the system to be used initially for only surveillance and not targeting. Because the small number of operational aircraft constrained training, some crewmembers were unfamiliar with targeting capabilities used in

Desert Storm. Nor were crews initially prepared to help forward air controllers with information on movement.

Like Desert Storm, operational experience gave NATO commanders, staffs, and aircrews the opportunity to learn more about system capabilities and an appreciation of its contribution to air operations. Fighter pilots recognized that the capability of JSTARS to detect, locate, and track vehicular movement eliminated the need for inefficient visual search and reduced deception by decoys and camouflage. During the conflict, the system began to cue both forward air controllers and unmanned aerial vehicles on the locations of vehicular traffic, allowing for more effective and efficient targeting of Serbian forces.

Another similarity was weather in the initial phases, which resembled what the ground offensive experienced in the Gulf War. When conditions improved, the so-called Kosovo Liberation Army began an offensive that forced the Serbs to move and mass. Even though the offensive was not powerful, it enabled E-8 surveillance and targeting capabilities to present Serb forces with an operational

dilemma. If they maneuvered in response to the offensive, they were visible to ground radar; but if they did not move for fear of being detected, they handicapped their ability to achieve the force ratios and position needed to defeat the light Kosovar forces with minimum casualties. As the JSTARS squadron commander put it, "The Serbs got smart—they realized that when they moved, they died; they attempted to move in smaller numbers—that didn't work either. JSTARS was able to see what was going on, share the information, bring iron on target, and help bring an end to the conflict."² According to the NATO air component commander, Lieutenant General Mike Short, Serb forces "got spanked from JSTARS and [unmanned aerial vehicle] cross cues."³

The dilemma that faced the Serbians may have been key to their decision to withdraw from Kosovo. After the conflict, the Supreme Allied Commander Europe reaffirmed the value of the system, testifying that "JSTARS was a big winner for us here. It is also all-weather; it really helped us understand what was going on both in the early stages and in the late stages."⁴

Afghanistan

One difference in Afghanistan was the delay in deploying JSTARS, which did not arrive in theater until after several weeks of combat. Although the Commander, U.S. Central Command, reported to President George Bush that he needed the system operating in the environment, much of the Taliban and al Qaeda vehicle movement had ceased by the time it was available.

The President recognized the relevance of movement, according to a reporter: "Our strategy is to . . . get the bad guys moving. We get 'em moving, we can see them, we can hit them."⁵ The Chairman also perceived the need to attack mobile rather than fixed targets but realized, "We've got a military that does great against fixed targets. We don't do so well against mobile targets. You're not going to topple a regime with this [fixed] target list."

Despite the delay, JSTARS operations were similar to previous conflicts. For example, the system was not deployed in numbers sufficient for persistent coverage. And like the final days of Allied Force, ground radar data cued the employment of other sensors, such as high-resolution but soda-straw fields-of-view sensors. Another encouraging similarity was system reliability. From November 7, 2001, to April 27, 2002, E-8s flew 249 missions (100 percent of those scheduled) and 245 (98.4 percent) were effective. Of the final 189 missions, 188 (99.5 percent) were effective. Yet like Kosovo, the distance the aircraft had to fly to reach an orbit reduced on-station time and increased air refueling requirements.

Like the Gulf War and the final days of Allied Force when the Kosovar offensive occurred, the presence of friendly land forces greatly enhanced the air operations JSTARS supported.

The threat the Northern Alliance presented was sufficient to cause Taliban and al Qaeda forces to move and concentrate and to rely on vehicles for firepower and armor, making it easier to detect, locate, track, and target them. Enhancing the contribution of ground radar information to targeting was the fact that almost no one except the Taliban or al Qaeda had vehicles.⁶

Nevertheless, fear of hitting civilians influenced the rules of engagement and exploitation of ground radar targeting. Reportedly, positive

GMTI radar is essential to an integrated network that provides situational awareness

identification was required to select civilian vehicles for air attack, often by land forces that actually saw the targets. Such rules not only handicapped an asymmetrical advantage, but also put military and civilian personnel at greater risk. Deploying eyes on the ground in proximity to an enemy is dangerous. Moreover, when vehicles are allowed to escape, their potential remains intact. And when the enemy in question is al Qaeda, Americans around the world are further endangered.

The terrain in Afghanistan also made screening a challenge, as it did in Kosovo. But it was not a major problem initially, given the relatively flat areas where Northern Alliance forces fought Taliban and al Qaeda forces. Moreover, even the ability to screen radar surveillance and targeting could be offset because it also constrained vehicle movement. Thus terrain can actually enhance radar surveillance and targeting when orbits

are well planned and capabilities such as unmanned aerial vehicles, U-2s, and Special Operations Forces complement radar surveillance.

The Way Ahead

GMTI radar is essential to an integrated network that provides situational awareness and the ability to attack across a large area before enemy units can close with friendly land forces. At the same time, experience shows that the learning curve for exploitation of such capabilities has not been steep, with many of the same problems arising in each conflict. To some extent the learning problems can be traced to the unprecedented nature of ground radar and the limited numbers of systems available for training. But a greater reason is the profound difference between peacetime training and combat.

The value of wide-area ground radar is more apparent on the operational than tactical level of war. The preponderance of training involving such surveillance and targeting capabilities is neither joint nor focused on the operational level; service training centers are geared toward combat by a single service, though forces from other services occasionally participate. And with a focus on combat, the importance of pre-hostility ground radar surveillance is neglected. Moreover, much combat training is devoted to the tactical level, ignoring the role of the operational level in determining when, where, or whether engagements must be fought. For example, the National Training Center is focused on the training brigade or lower echelons to fight regimental-size opposing forces in close combat.

Although this center provides one of the few opportunities for the Air Force to train against a realistic opposing land force, it is usually confined to close air support. Moreover, according to the Chief of Staff of the Air Force, "The results [of close air support in exercises] are never fully appreciated. If we attrited the red force with air, then they'd never get engaged on the ground. When you think about what's the lesson taught to generations of

Enduring Freedom

When the Taliban in Afghanistan failed to deliver terrorist leaders and close their training camps in the wake of 9/11, the United States initiated air strikes in early October 2001 to support resistance by the Northern Alliance. The Taliban regime fell from power by December and the operation was subsequently focused on stabilization and reconstruction. Periodic efforts to kill or capture al Qaeda and Taliban members continued, however, such as Operation Anaconda in March 2002. **JFQ**

Global Hawk,
Enduring Freedom.



1st Combat Camera Squadron (Ft. Rucker, Fla.)

young soldiers, [it's] 'Y'all got these airplanes but they're no help to me.'"⁷ Such training clearly does not support the operational level, in which targeting combat units and, often more importantly, logistic support can eliminate the need for close combat. Given the single service, tactical, and close combat orientation for most peacetime training, it is not surprising that learning to fully exploit radar ground surveillance and targeting capabilities has been largely confined to on-the-job training during conflicts.

The Pentagon is reportedly considering a project known as T2. The Secretary of Defense noted that "we

need to train like we fight and fight like we train, and too often we don't."⁸ The strategic plan for transforming training makes establishing a joint national training capability a top priority. This would provide tools to train regularly with forces from multiple services using live-fire and training simulators. It also includes augmentation by computer-generated synthetic forces, which would provide the realistic operational-level environment needed to put the tactical level into perspective. Clearly, a joint national training capability would provide commanders an

opportunity to learn in peacetime how to fully exploit ground radar surveillance and targeting.

Training is an essential prerequisite for the military transformation in meeting the strategic implications of enemy land forces. Commanders must use joint training to integrate land and air forces by using maneuver and standoff air attack to create an intractable operational dilemma for an enemy while maneuvering to avoid close combat, except when overwhelming advantages and close combat make contributing to campaign objectives worth the risks.

A commander attempting to create such a dilemma will soon find that enemy vehicular movement provides a more reliable means for assessment than attrition. For example, when the objective is stopping movement, ground moving target indicator radar will quickly reveal whether the attack was successful. And thanks to this surveillance, it is possible to make this assessment in real time, even in darkness and bad weather. With the realistic joint training the transformation in training is designed to achieve, commanders should become confident that it is feasible to quickly defeat opposing land forces using fewer and lighter land forces. **JFQ**

NOTES

¹ Charles A. Horner, "An Information Superiority Lesson," *ISR Journal*, vol. 1, no. 1 (January/February 2002), p. 17.

² Tony Capaccio, "Northrop Grumman Joint Stars Led Most Lethal Attacks on Serbs," *Bloomberg News* (June 29, 1999).

³ Briefing, 93^d Air Control Wing, Robins Air Force Base, May 31, 1999.

⁴ Wesley K. Clark, testimony before the Senate Armed Services Committee, July 1, 1999.

⁵ Bob Woodward, *Bush at War* (New York: Simon and Schuster, 2002), pp. 153, 174.

⁶ "Targeting Improving; No Problems with Coordination, Rumsfeld Says," *Aerospace Daily* (November 20, 2001), p. 4.

⁷ "CAS Role Damaged by Staffing, Training Structure, Jumper Says," *Aerospace Daily* (February 27, 2003), p. 4.

⁸ "Joint National Training Capability: The Next Wave in Transformation," *Inside the Pentagon* (February 20, 2003), p. 1.

Iraqi Freedom

The U.N. Security Council found in November 2002 that Iraq remained in material breach of resolutions banning weapons of mass destruction. Later in the month inspectors returned to verify the disarmament efforts. But members of the Security Council were divided over whether Baghdad was cooperating with the inspections. In March 2003 the United States, which had begun to deploy forces to the region, suspended negotiations and demanded that Saddam Hussein leave Iraq within 48 hours or face war. When he refused to comply, U.S. and allied forces launched combat operations. Organized enemy resistance ended by mid-April. Approximately 467,000 Americans and 43,000 coalition troops were deployed during the combat phase of the operation. **JFQ**



U.S. Air Force (Greg L. Davis)

Centralized Control/ Decentralized Execution in the Era of Forward Reach

By MARK G. DAVIS

The phenomenon of political and military leaders reaching forward into the realm of tactical operations has existed since Thucydides. It differs today because of technology, doctrine, and the current operational environment. Enduring Freedom

demonstrated that technology can provide commanders on all levels with immediate situational awareness and that joint publications can offer doctrine on every aspect of operations. Moreover, warfare is no longer controlled under the same model that prevailed throughout most of the 20th century. Commanders can anticipate conducting operations in an environment in which political goals are vague; domestic and international support is tentative; and casualties are dutifully avoided. To redress this dilemma, DOD has spent

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billions on command, control, communications, computers, intelligence, surveillance, and reconnaissance (C⁴ISR) systems. As a result, centralized control and decentralized execution pursued by the Air Force is not valid in view of joint doctrine and the emergence of effects-based operations.

Takeoff to Landing

The first doctrinal issue is the inconsistency between centralized control and decentralized execution and the joint precept of centralized planning and direction. As a reaction to the

from a joint perspective, centralized control and decentralized execution is illogical and cannot exist together

bombing of Vietnam during Rolling Thunder in 1971, the Air Force altered the concept of centralized control to include decentralized execution. Since then, centralized control and decentralized execution has been accepted by the service as the best way to employ airpower. By contrast, Joint Publication 1, *Joint Warfare of the Armed Forces of the United States*, establishes that centralized planning and direction is “essential for controlling and coordinating the efforts of all forces available.” What is more, Air Force Doctrine Document (AFDD 1), “Air Force Basic Doctrine,” states that “centralized control is the best way to employ air power,” which would be opposed by the Army and Marine Corps, which utilize centralized planning and direction and mission-type orders to employ forces.

Because senior officers of the Air Force are routinely selected as joint force air component commanders (JFACCs), it is essential that its doctrine and execution methodologies mirror those prescribed in joint doctrine. Its tenet of centralized control is not a recognized term in joint doctrine and is causing confusion not only

within the Air Force but throughout the joint community. The following statement is an example of the dichotomy between Air Force and joint doctrine. Joint Pub 1 states, “Unity of effort, centralized planning and direction, and decentralized execution are key considerations in joint operations.” Where conflict arises between service and joint doctrine, joint doctrine takes precedence, according to Joint Publication 0-2, *Unified*

Action Armed Forces. It is therefore imperative that the Air Force core tenet of centralized control and decentralized execution be modified to reflect the principles outlined in joint doctrine. Centralized planning and direction is consistent throughout joint doctrine and clearly shows that this tenet is contradictory to the basic command and control tenet outlined.

From a joint perspective, centralized control and decentralized execution is illogical and cannot exist together because control is about execution and is inherent in command, as explained in Joint Publication 3-0, *Doctrine for Joint Operations*. An aircraft is under centralized direction virtually from takeoff to landing through a series of control functions: Joint force commanders and

JFACC maintain operational or tactical control of each aircraft on the air tasking order; the airman is required to execute only those missions derived from the air tasking order or in the case of time sensitive targets when directed by joint commanders; the airman must adhere to the instructions as outlined in the airspace control order and special instructions; to receive direction and guidance the airman must communicate over the theater air-to-ground system, which exists to expedite the ability of joint commanders to control air operations; and finally, if the aircraft is conducting close air support, it must receive clearance from an air or ground controller before releasing its ordnance. The only decentralized aspect in this mission scenario is the tactics involved in striking the target, and even then rules of engagement could be a controlling factor.

Another clear discrepancy between joint and service doctrine involves control of airpower. AFDD 1 is unequivocal in insisting that “Air and space power must be controlled by an airman.” By comparison, Joint Publication 3-56.1, *Command and Control for Joint Air Operations*, states that a joint force commander will assign responsibilities for air operations to a commander with the preponderance of air assets and skill to control joint air operations.” Moreover, when “a JFACC is not designated, the JFC may plan, direct, and control joint air operations.” Joint doctrine makes it quite clear that centralized planning and direction of joint air operations can be assigned not only to airmen, as Air Force doctrine would seem to imply, but to senior officers from the Army, Navy, and Marine Corps with control over substantial air resources and requisite qualifications.

Centrifugal Force?

Command relationships are another doctrinal issue that generates concern. Joint Pub 3-0 outlines four relationships: combatant command,



Gardez Valley, Afghanistan.

55th Signal Company (Andres J. Rodriguez)

Desert Storm.



DOD (Kimberly Yeargan)

operational control, tactical control, and support. Centralized control is missing from that menu and its ambiguous definition in AFDD 1 might leave some airmen guessing. Does the Air Force tenet of centralized control bestow command authority over assets once aircraft are aloft or does execution authority and responsibility continue to reside with joint commanders? As noted, when taken as a whole, this tenet confuses the issue of control, which according to Joint Pub 3-0 is inherent in command. Joint doctrine satisfactorily addresses the level of control of forces delegated to joint commanders by establishing relationships for particular missions or operations, and centralized control is not among them.

The third issue deals with decentralized execution and the realities of modern air operations. Air Force doctrine defines decentralized execution as delegating “execution authority to responsible and capable lower level commanders . . . to achieve span of control and to foster initiative, situational responsiveness, and tactical flexibility.” Does this statement accurately reflect the realities of air operations since Deliberate Force, Allied

Force, Enduring Freedom, and Iraqi Freedom? Have the joint air operations planning process, air tasking order cycle, theater air-to-ground system, and C⁴ISR fusion capabilities within the air weapons operation center subsumed all responsibility from subordinate air commanders on the wing and squadron level and made joint commanders the focal point for every aspect of air operations? As Joint Pub 3-56.1 states, “The JFACC directs . . . the air operations plan [centralized planning] and a responsive and integrated control system [decentralized execution].” Again, joint doctrine refers to centralized planning, not centralized control, and additionally describes the theater air-to-ground system as the method for utilizing decentralized control. That system enables joint commanders to exercise control over the air and space environment, control air missions to achieve assigned air operations objectives, and finally produce command, control, communications, and computers systems that enable the control of assets. It would be difficult to describe the theater air-to-ground system as anything but a tool for joint commanders to extend control over the execution of air operations.

The military reluctantly turned to decentralized execution in the past because technology did



U.S. Army (Brandon R. Aird)

Kirkuk, Iraq.

not exist to provide an integrated network to control operations. Today, unity of effort is achieved not by decentralized execution but through an elaborate system of systems that enables centralized planning and direction on the highest levels. The spirit of decentralized execution resides in senior commanders issuing mission-type orders to subordinates and allowing them to develop plans and execute missions based on the mission and intent of higher command, as outlined in Joint Pub 3-0. The joint air operations planning process, air tasking order cycle, and theater air-to-ground system have usurped this precept of joint operations. Decentralized execution is established joint doctrine, but it would appear that the Air Force tenet of centralized control is inconsistent with its spirit and the realities of modern joint air operations that require centralized planning and direction.

The fourth issue that invalidates the tenet of centralized control and decentralized execution is that doctrine allows joint commanders to reach forward. This is best illustrated in Joint Pub 3-0: "JFCs have full authority to assign missions, redirect efforts, and direct coordination among subordinate commanders . . . in addition the command authority [combatant command] provides the JFCs unlimited authority to direct every aspect of the operation." Until doctrinal changes are implemented, joint force commanders will continue to

have the authority to play JFACC, wing commander, and tactical fighter pilot.

A fifth issue is focused on the principles of war, specifically unity of command. In Joint Pub 3-0, unity of command means that "all forces operate under a single commander with requisite authority to direct all forces employed in pursuit of a common purpose." In comparing this tenet with unity of command it might be concluded that it is merely a duplication of a principle of war, readily acknowledged as the enduring bedrock of doctrine. Centralized control and decentralized execution is not necessary when such principles are already inherent in joint operations.

The final doctrinal issue deals specifically with the emergence of effects-based operations and its impact on centralized control and decentralized execution. These operations are conceived and planned in a systems framework that considers the full range of direct, indirect, and cascading effects by the application of military, diplomatic, psychological, and economic instruments. They embrace the notion that political, economic, and diplomatic considerations are more important than military conquest. They represent a top-down process rather than usual bottom-up operations.

Because of casual linkages among target sets and the danger of objective fratricide, effects-based operations must be orchestrated by a centralized planning and execution authority that has situational understanding of every aspect of



1st Combat Camera Squadron (Ken Bergmann)

Ramstein air base,
Allied Force.

the diplomatic, informational, economic, and military campaign. Such operations will add myriad players to the targeting process to include economists, nongovernmental officials, bankers, lawyers, and politicians. It will require micromanagement of air operations and demand enhanced C⁴ISR systems to control all aspects of ground, sea, and air maneuvers. It would be impossible for

it would be impossible for centralized control and decentralized execution to coexist with a true effects-based campaign

centralized control and decentralized execution to coexist with a true effects-based campaign strategy construct.

The areas highlighted above have emphasized the tactical and operational friction points that arise when contrasting centralized control and decentralized execution with the concepts codified in joint doctrine. The most significant danger facing the joint community is not the impact that this tenet will make on tactical and operational warfighting methods, but how it will affect the strategic thinking by senior political and military leaders. Centralized control and decentralized execution, and specifically centralized

control, could lead to tactical and operational considerations that define strategy, sometimes called *tacticization of strategy*.

Traditionally, the levels of war are depicted as a pyramid with the strategic level on top and the operational and tactical levels in subordinate positions. Today, the lines separating these levels are difficult to discern. Codifying centralized control in doctrine will further confound an already complicated situation. On the strategic level, centralized control influences decisionmaking in three ways. First, the operational level will be less critical because sensors and shooters are becoming strategic. Secondly, centralized control and the emphasis on the capability to destroy targets with precision-guided munitions will result in strategic success without first identifying political goals. Finally, centralized control increases the likelihood of intervention by political and military leaders removed from the fight. The danger of centralized control is subverting long-range strategy that looks beyond the capabilities of weapons platforms and destruction of targets.

Centralized control and decentralized execution is not possible in an environment in which political factors nullify military efficiency and emerging joint doctrine enables commanders to reach forward and direct air operations. In the event, neither technology nor the environment invalidate centralized control and decentralized execution in military operations; rather it will be joint doctrine and the emerging strategy of effects-based warfare that will decide its fate. **JFQ**



DOD (Dean Wagner)

Operational

Command and Control in the Information Age

By MILAN N. VEGO

A major tenet of command and control is centralized direction and decentralized execution. But there has been steady movement in the last decade toward increased centralization on all levels. This trend should be arrested and the German-style task-oriented command and control from top to bottom adopted. Otherwise the Armed Forces

could find themselves resembling the former Soviet military and paying a heavy price in the quest for absolute certainty and control.

Centralization

Authority is concentrated in a single commander and headquarters under centralized (order-oriented) command and control. One actor determines objectives and directs their accomplishment. Centralization ensures unity of effort through unity of command, facilitates decisionmaking, offers effective use of forces and assets, eliminates uncertainty, and maximizes

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control. But subordinate commanders do not have much latitude in decisions and suffer from low morale and motivation. Under centralized command and control, detailed orders can persuade tactical leaders against taking advantage of changing circumstances.

The Soviets used centralized command and control during World War II by issuing binding orders to field commanders. The result was com-

manders who would not consolidate and exploit combat success because they could not act without orders. Moreover, American and British forces relied extensively on directive orders in

1944, which explains their almost six-month advance from Normandy to the German border, despite superiority in men and matériel.

The more political the objective, the greater the need for centralized command and control. The lack of common operational concepts and doctrine requires more centralization on all levels. Additionally, poorly educated and trained subordinates can be controlled only by detailed orders. Centralization is also essential when leaders will not accept errors by their subordinates, especially in crises that might lead to hostilities. During the Cold War, national command authorities on both sides controlled the actions of their commanders. Centralization is suitable when situations such as fixed defense evolve slowly. It is also suited to the unique limitations of peace operations which, in turn, can severely influence freedom of action on the ground.

The Trend

The most serious current problem in the Armed Forces is the trend toward overcentralized decisionmaking on the operational and strategic levels. Centralized command and control may not preclude the defeat of a capable enemy, but it extorts a price. For example, in the initial phase of the German invasion of Russia in 1941, Joseph Stalin and his military advisors tried to run the war by themselves with catastrophic consequences. The Soviet high command made all the strategic decisions. Subordinates were not allowed to exercise their initiative. Stalin personally ordered ill-conceived counteroffensives and forbade withdrawals, resulting in the encirclement of hundreds of thousands of men who were destroyed by fast-advancing enemy armor. Yet despite monopolizing decisionmaking, the high command had little effect on the outcome.

The German army demonstrated the application of task-oriented command and control and the impact of being abandoned by its strategic leadership. Its successes in 1939–41 resulted from the freedom of action that Adolph Hitler and the supreme command gave operational commanders. Army commanders were issued instructions and not detailed orders. Moreover, the Fuehrer did not unduly interfere in operations during the Polish campaign. These practices eventually gave way to more intrusive orders after the start of the invasion of Russia. In the first major German defeat at the gates of Moscow, Hitler took command, turning the army general staff into a de facto personal staff as he had the supreme command.

Hitler centralized policy and strategy and also made operational decisions. He increasingly bypassed the supreme command and army group commands. Task-oriented command and control was abandoned and he issued detailed orders down to mid-level echelons, which allowed for no interpretation. Hitler directed group commanders that a certain city must be held or that a corps or division must hold its occupied position. His experiences as a soldier during World War I formed the basis of his decisions. Like Stalin, he rarely allowed a withdrawal from untenable positions, leading to large losses on the eastern front in 1942–45.

Today operational commanders often bypass immediate subordinate commanders and issue direct orders to tactical commanders in the field, as Allied Force and Enduring Force illustrated. This circumstance prevailed because of the inability or unwillingness of operational commanders to delegate authority. In general, leaders bypass subordinates because they distrust their competence. A narrow tactical perspective is another reason for micromanagement despite lessons of the past, which indicate that such practices are invariably detrimental to an organization in combat.

Overcentralized command and control undermines morale and encourages an unwillingness or inability on the part of subordinates to act independently and take responsibility for their actions. Among other concerns, eliminating independent action leaves no reliable way to gauge promotion potential of junior and mid-level leaders.

Advances in communications allow senior leaders to observe events in near real time from thousands of miles away. This promotes a false impression that remote headquarters can perceive the situation better than tactical commanders on the scene. Consequently, not only must tactical commanders report to operational commanders, but the latter often issue orders to the tactical level. Intermediate commanders are bypassed and relegated to being information administrators as

overcentralized command and control undermines morale and encourages an unwillingness to act independently



U.S. Marine Corps (Mauricio Campino)

Intelligence briefing, Iraqi Freedom.

more senior leaders immerse themselves in details. Networking supposedly promises decentralization, affording greater initiative to subordinates. Evidence suggests the opposite: theater commanders increasingly use information technology to make decisions that would normally be the province of tactical commanders.

Real-Time Knowledge

During Enduring Freedom, senior leaders in the United States not only observed but also second-guessed subordinate commanders. Commander, Central Command, reportedly exercised direct command in real time over forces in Afghanistan from headquarters in Florida. He could also monitor images of the battlefield from unmanned aerial vehicles that were retransmitted

by orbiting satellites. His headquarters was networked via satellite with headquarters in Kuwait and Uzbekistan.

Experience proves that theater commanders have less need for real-time knowledge than subordinate commanders. Also, at theater level, the volume of the real-time information available makes it more difficult to focus on operational instead of tactical aspects of the situation. During Millennium Challenge, tactical units received orders from senior levels, sometimes without the knowledge of intermediate commanders. Computer networks can apparently turn the traditional chain of command into a web of command

Press conference on
Operation Anaconda.



DOD (P.D. Ward)

that is deemed highly desirable. Yet it is an illusion to think that senior leaders can grasp tactical intricacies better than their subordinates. Nor can they take advantage of their fleeting opportunities on the ground.

During World War II, Admiral Chester Nimitz, the theater commander in the Pacific, and Admiral Raymond Spruance, the fleet commander, realized their commanders on the scene were best suited to make tactical decisions. Nimitz reportedly left commanders alone because looking over their shoulders inhibited them. As long as commanders had the responsibility, they had the freedom to do what they thought best. At the same time, both leaders made recommendations by radio if local commanders were overlooking opportunities. Nimitz and Admiral Joseph King, the Chief of Naval Operations, allowed freedom of action but were not slow to intervene or relieve a commander.

Technology is a two-edged sword, especially when developments lend themselves to ever greater centralization and, in extreme cases, to battlefield micromanagement. Some 130 years ago, Field Marshal Helmuth von Moltke warned that the most unfortunate senior commander is one who suffers under close supervision and must continually give an account of his plans and intent. This supervision may be exercised through a delegate of the highest authority at his headquarters or by a telegraph wire attached to his back. In such cases, all independence, rapid decisions, and audacious risk—without which no war can be won—cease.

Delegating Authority

Operational commanders who specify everything for subordinates will get lost in myriad details and lose their perspective. They will also risk losing the trust of their subordinates and undermine the basis of their decisions. Senior army

commanders in Vietnam used helicopters as airborne command posts to direct commanders on the ground. Technology enabled senior leaders to make purely tactical decisions. During the Kosovo conflict, General Wesley Clark, USA, the Supreme Allied Commander Europe (SACEUR), interfered with the responsibilities of the joint force air component commander at Allied Force South. The personal relationship between these leaders was accordingly troubled. Clark reportedly selected fixed targets, stipulated the means to attack them, and aborted attacks on targets in progress.

Regional commanders seem unwilling to delegate authority through intermediate levels of command. In the Persian Gulf War, Commander, Central Command (CENTCOM), was also the commander of the Kuwaiti theater of operations as well as de facto land component commander, with his forward headquarters at Riyadh. In the conflict against Serbia in 1999, SACEUR ran day-to-day operations rather than delegating responsibility to his subordinate, the commander of Allied Forces Southern Europe. He also got bogged down in making tactical decisions instead of devoting himself to strategy and policy as the senior NATO military officer.

In Enduring Freedom, Allied Forces Central Command ran the war from some 8,000 miles away. The distance between headquarters and subordinates on the ground still matters even in the information age. Greater distance means less ability to make timely decisions. Distance also affects the performance of respective staffs, largely because of different battle rhythms caused by different time zones.

The human dimension of leadership is largely ignored by apostles of information warfare. Senior commanders should be close to battle where subordinates can see them. This can enhance morale and build trust. Hence theater-strategic commanders could establish a subordinate theater of operations command or combined joint task force prior to hostilities. This command would be directly accountable to the theater-strategic commanders and responsible for day-to-day planning and execution of joint and combined operations or campaigns. Such a solution in Kosovo and the combat phase of Enduring Freedom would have relieved the theater-strategic commander of direct involvement in tactical matters. At the same time, intermediate commanders could improve their control over forces by their proximity to the fight. Moreover, theater-strategic commanders could devote time and energy to strategic and operational affairs in their areas of responsibility.

EOD team, Iraqi Freedom.



1st Combat Camera Squadron (Billy Johnson)

targets are often selected first, then the search starts for objectives

Targetteering

Another result of the increased centralized command and control is that the planning and execution focus is almost exclusively on targets to be degraded, neutralized, or destroyed, not the objectives and tasks to be accomplished. Targets are often selected first, then the search starts for objectives. This violates the foundation on which the regressive planning process rests. The ultimate operational or strategic objective is determined first for a major operation or campaign. Afterward, intermediate major tactical or operational objectives must be resolved as well.

The main reason for the excessive focus on the targeting process among U.S. planners is the uncritical acceptance of the flawed five-ring theory. The most serious error is belief that each ring consists of a single or many centers of gravity. In practical terms, these centers are targets to be attacked. It is wrong to suppose these centers are vulnerabilities. With this belief, the logic of what constitutes a center of gravity is turned on its head. It is directly related to one's objective. In analyzing enemy critical factors, a center of gravity is invariably found among its tangible and intangible strengths whose serious degradation, neutralization, or destruction would prevent it from accomplishing its objective, not critical weaknesses

or vulnerabilities. Today, many parties from the Joint Staff in Washington to tactical commanders and agencies in the field are involved in target development, selection, and approval.

Allied Force and Enduring Freedom are the latest examples of the targetteering approach to warfare. In the former operation, SACEUR pressured planners to produce a list of 5,000 targets. After being informed there were not that many in Serbia, he reduced the number to 2,000. Many targets eventually attacked were unrelated to military capabilities. The targeting process involved numerous planners at the Pentagon and elsewhere in the United States as well as Great Britain, Supreme Headquarters Allied Powers Europe, U.S. European Command, and the combined air operations center in Italy. And worse, selection and approval were time-consuming, politicized, and random, which resulted in ad hoc targeting.

Each strike in Enduring Freedom was approved by CENTCOM headquarters in Tampa. Military lawyers vetted targets on all echelons from the Pentagon and unified command level to the combined air operations center in Saudi Arabia and carrier battle groups and ground forces in Afghanistan. The Joint Staff selected targets while Navy and Air Force planners abroad, chiefly in



55th Signal Company (Ronald Mitchell)

Briefing in Bagram,
Afghanistan.

Saudi Arabia, determined how strikes would be carried out, prepared daily air tasking orders, and established aircraft packages for given missions. However, in contrast to prevalent practices, target selection—creating a joint prioritized list for both ground and air targets—was made by CENTCOM for four months until Anaconda in March 2002. Often intelligence and advances in shortening the time to carry out strikes were degraded by delays in obtaining approval from senior commanders. In addition, many attacks on time-sensitive targets failed because controllers from the Central Intelligence Agency or Special Forces had to get approval from Tampa.

One solution is putting target selection at the end of the planning process, not the front. Objectives and tasks should dominate planning. Targeting should be decentralized with higher levels of command less involved in tactical and technical details. Control on the operational and strategic levels should be exercised through appropriate guidance and rules of engagement. The result would be faster decisions on target selection and attack. Specifically, the process should reside with service or functional component and joint task force commanders. In issuing strategic guidance, the national, alliance, or coalition authorities should specify desired strategic endstates, objectives, and limitations on which categories and individual targets can be attacked. Afterward, theater commanders should specify detailed targeting limitations in their operational guidance.

Estimates of the situation, when conducted by commanders and their staffs, would ensure that the focus is firmly on objectives and tasks, not targets. Hence objectives and corresponding centers of gravity should be determined first. Then the main tasks and component (partial) tasks can be determined for each objective. Subsequently, a target list can be developed and targets

selected for component tasks. The focus must be on targets whose destruction or neutralization would cause a ripple effect and lead to accomplishing the assigned task.

Focusing on targeting makes it harder to determine whether and when an objective has been reached. It also wastes time and resources. As Kosovo demonstrated, emphasizing targets instead of objectives and tasks can lead to attrition warfare on the operational and strategic levels. This outcome may not be critical in operations like Enduring Freedom, where victory is assured, but could have serious consequences when an enemy is stronger. Moreover, targetteering directs almost all the attention of the operational commanders and their staffs to the tactics of weapons and platforms instead of the operational and strategic situation.

Task Orientation

The Armed Forces could meet the challenges of information technology by reinforcing the tenets of centralized control and decentralized execution found in joint doctrine. Decentralization is often regarded as synonymous with *Auftragstaktik*, the concept of task-oriented command and control. Its prerequisites are understanding the nature of war, a common operational and tactical outlook, common doctrine and vocabulary, a high degree of professional education and training, and the highest degree of leadership by senior commanders and their subordinates.

Decentralization of large formations during the Wars of German Unification (1864–71) resulted from the increased range and lethality of weapons, railroads, and telegraphs. The effect was a larger theater in which armies were deployed and maneuvered. Commanders were unable to fully observe or control their forces. Another effect was the intensity of combat and need to disperse forces over the theater. Moltke recognized that the flow of information would never be fast enough to allow control by commanders at headquarters in the rear, even with the telegraph. He thus fostered independence of thought, believing that officers must act on their own at times. They should not wait for orders when no orders can be given. Their efforts are most productive when following the intent of the senior commander.

Task-oriented command and control is based on the conviction that subordinate levels of command act more quickly than higher levels in changing situations because of their proximity. On the level of execution, knowledge of the various aspects of the situation are far greater than on senior levels. Hence the assumption is that decisions are generally sounder on the tactical level than tactical decisions made on the operational or higher echelons. Independence of action also can

Planning room aboard
USS Harry S. Truman,
Iraqi Freedom.



Fleet Combat Camera, Atlantic (Michael W. Perdegrass)

the limitations of task-oriented command and control are found in mistrust between senior and subordinate leaders

motivate subordinates. The Germans believed a favorable situation could not be exploited if commanders waited for orders. Senior level commanders and low ranking soldiers recognized that omission and inactivity were worse than resorting to the incorrect expedient. Commanders on all levels had latitude for initiative and prompt action, on their own authority if necessary.

Inaction was considered criminal, but deeds were to be performed in consonance with objectives set by senior commanders, who were obliged to intervene when subordinates endangered the mission.

The application of task orientation for command and control is particularly suitable when objectives are predominantly military, combat is intensive, and changes of situation are rapid and often drastic. It is less applicable in scenarios requiring immediate action or where an error can lead to severe political or strategic consequences. The scope of the subordinate's independent action must be reduced when the senior command authority must coordinate the actions of adjacent or friendly forces.

Among other things, the limitations of task-oriented command and control are found in personal rivalries, unhealthy self-esteem, character

weakness, insecurity, and mistrust between senior and subordinate leaders. These factors lead to suspicion or disobedience. Both the incompetence of subordinates and the interference of senior commanders in purely tactical matters can significantly reduce the scope of task-oriented command and control.

Rapid technological advances are pulling the conduct of war in contradictory directions. Senior commanders can observe events in near real time and almost instantaneously control them from their headquarters, as seen in Allied Force and Enduring Freedom. Yet this does not justify unnecessarily usurping authority on the tactical level. Today commanders can intervene faster but should do so only when subordinates endanger the mission.

Despite technological advances, terrain and distances matter, as witnessed in Afghanistan and Iraq. The nature of war today is essentially the same as it was for Clausewitz and Moltke. Proponents of information warfare ignore the wisdom of Clausewitz by trying to limit warfare to fixed values and physical quantities. Wars will continue to be characterized by friction, uncertainty, and chaos. It is a mistake to believe that advances in communications will make it otherwise.



U.S. Air Force (Delilah Castillo)

Aviano air base,
Allied Force.

Perhaps the chief argument for German-style, task-oriented command and control is that friction and the fog of war are best mastered by a high degree of independence. Detailed tactical picture technology should be used to monitor unfolding events by senior officers who intervene only when necessary. Morale and motivation remain enormously valuable. Psychological factors cannot be dismissed, as some proponents of information warfare may believe. Vietnam revealed the folly of overestimating technology and equating leadership with management. Measurable or quantifiable methodologies have replaced human analysis, individual initiative, and independence of execution. Yet the focus of command and control on any level should be the human element, not technology that supports it. Mastering technology does not make leaders successful.

Out of Focus

The true nature of war is often misunderstood or ignored. The aphorisms of Sun Tzu are taken literally while the dicta of Clausewitz are considered irrelevant in the information age. The importance of technological innovations is recognized, while human and psychological factors of command and control are neglected. Senior leaders are apparently unwilling to delegate authority and establish intermediate levels of command or use existing echelons. In addition to interfering in the purely tactical decisions and actions of subordinate commanders, there is a growing trend to bypass tactical commanders and deal with subordinates or individual soldiers on the ground. Recent successes over weak, technologically backward, and largely passive enemies seem to have convinced many observers that information technology reinforces the need to centralize

functions on the operational and strategic levels of command. Yet success in war demands sound balance between centralized and decentralized command and control. Experience has shown that when fighting highly capable and resourceful enemies, excessive centralization has never been an answer if the victory must be won decisively with the fewest friendly losses.

While proponents of information warfare claim that their goal is furthering decentralized decisionmaking on all levels, the trend is in the opposite direction. Tactical commanders should not be passive observers and mere transmitters of orders. As freedom of action is diminished, they cannot exercise initiative to achieve the intent of senior leaders. In addition, officers who are unaccustomed to acting independently may fail to take prudent risks as senior commanders.

The emphasis on information technology and targeteering is troubling for several reasons. Targeteers reduce the art of war to a process of collecting information on specific categories and individual targets that are attacked with little regard to their relationship to objectives and tasks. Selection is unwieldy, time-consuming, and ineffective. Excessive focus on targeting means that the perspective of operational commanders and their staffs is becoming tactical. A targeteering approach carried to its logical conclusion can only result in a war of attrition on the operational and strategic levels when fighting against a relatively stronger and more competent enemy.

The problems of centralized command and control could be solved by adopting the tenets of task-oriented command and control. This means accepting that war is not a science but an art. Friction and the fog of war are inherent in combat. Advanced information technologies can reduce uncertainty but not eliminate it. The more complex the technological innovation, the higher the friction. Technology is only a means to an end, not an end in itself. Hence operational command and control must focus on those elements of combat power, leadership in particular, that will enhance the ability to fight and win decisively with the fewest losses. Education and training are critical to applying task-oriented command and control on all levels of war. **JFQ**



U.S. Army

Revisiting the Korean Tree-Trimming Incident

By RICHARD A. MOBLEY

In August 1976, two Americans were killed while supervising a work party at Panmunjom. The incident involved a detachment of U.S. soldiers who were trimming a poplar tree in the joint security area to improve visibility between checkpoints when North Korean troops attacked them. In response, the United States raised the defense readiness condition, reinforced the peninsula, and chopped

down the tree. The incident represents a case study in crisis planning and joint operations prior to passage of the Goldwater-Nichols Act.

The attack is worth studying because the United States extracted an apology, albeit weak, from the North Korean leader, Kim Il Sung, who characterized the incident as regrettable. But the official records, which began to be declassified in 1994, shed new light on the incident. They reveal profound uncertainty about the intent of Pyongyang but an equally deep American desire to retaliate. Indeed, simply chopping down the tree was the mildest action considered by the National Security Council. Washington wanted to keep

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close tabs on the operational commander; its desire to send the right signal had not wavered since Vietnam. Moreover, the Joint Chiefs and General Richard Stilwell, USA, Commander in Chief, United Nations Command (UNC), were concerned about rapid escalation and protecting the force chopping down the poplar. Evidence also suggests the desire to deter through exceptional measures taken for weeks after the tree was felled.¹

The Korean Context

The so-called second Korean War ended by 1976. Hundreds of provocations along the demilitarized zone (DMZ) and in the South subsided.

Pyongyang did not repeat earlier acts such as the attempted assassination of President Park Chung Hee, seizure of *USS Pueblo*, or shootdown of a Navy EC-121 aircraft with 31 crewmen on

the Central Intelligence Agency concluded that Pyongyang might have been attempting to influence the 1976 election

board. Indeed, the situation calmed enough by 1970 for President Richard Nixon to order the withdrawal of 7th Infantry Division.

Although the Central Intelligence Agency did not believe Pyongyang intended to invade, it warned “We are not at all sanguine that [intelligence sources] could provide a clear and timely warning of a North Korean attack.” At that time, over half of the Korean People’s Army (KPA) was combat ready and within 50 miles of the demilitarized zone. The intelligence community held “that Pyongyang could mount a sizable attack with little or no warning.”²

The communist propaganda intensified in March 1976 with Kim proclaiming his intention

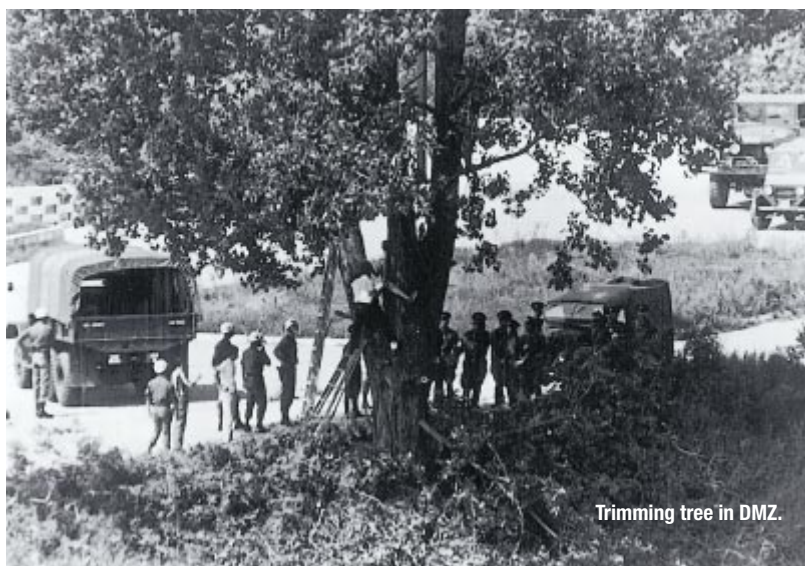
to “stir up world opinion more vigorously” by publicizing “U.S. criminal barbarities.” He sought to “make the Korean question the focal point of attention both in Asian and world affairs.” In daily broadcasts, Pyongyang accused America of creating a grave situation. Shortly after an exchange of fire along the demilitarized zone on August 5, North Korea claimed that the United States and South Korea had “completed war preparations,” the first such statement since 1969.³

An assessment by the Central Intelligence Agency concluded that there were two proximate causes for increasing tension in the joint security area. Pyongyang wanted to support its claim that the United States was the major danger on the peninsula. The Nonaligned Movement summit in Colombo, Sri Lanka, which was meeting when the incident occurred, would provide the venue for the assertion. In addition, Pyongyang might have been attempting to influence American opinion during the 1976 election.

August 18

North Korea revealed its sensitivity in mid-August. A few days before the incident, United Nations Command sent unarmed Korean maintenance workers to determine how to remove the tree. Communist guards warned them to leave it alone. As a compromise, the command planned to trim rather than chop down the tree. That would allow UNC checkpoints 3 and 5 to see each other at the least. The command accordingly dispatched a 15-man tree-trimming team (three officers, five laborers, and seven security troops) into the joint security area at 1030 hours on August 18.

The report on the incident relates a dramatic series of occurrences over a six-minute period. Two KPA officers and nine guards appeared. When informed by the Americans that the tree was only being trimmed, a communist officer voiced his approval and the guards began to offer advice. But at 1050 hours the North Koreans ordered the work to halt and threatened the UNC personnel. Thirty guards appeared and attacked Captain Arthur Bonifas, the detachment commander. Witnesses saw them bludgeon Bonifas with the blunt end of an ax as he lay on the ground. The communists also attacked First Lieutenant Mark Barrett and other soldiers with axe handles and clubs. Photos reveal two instances where seven and nine KPA guards clustered around soldiers and struck them with ax handles and clubs as well as their feet and fists. Bonifas and Barrett died at the scene and several other Americans were injured.



Trimming tree in DMZ.

U.S. Army



A response to the attack was approved within two days and ready for execution in three. Because of the 13-hour time difference, activity in theater occurred as Washington slept. During the day, the command sent back operational reports and forwarded photos of the event. Moreover, various responses to the incident were considered, including chopping down the tree. In addition, Stilwell proposed issuing a strongly worded protest to Kim Il Sung in his notional role as supreme commander of the Korean People's Army.



U.S. Army

On August 18, the Secretary of State, Henry Kissinger, telephoned President Gerald Ford in Kansas City, where he was attending the Republican convention. Other members of the cabinet, including the National Security Advisor, Brent Scowcroft, were located in the capital, though the Secretary of Defense, Donald Rumsfeld, was at home in Michigan recovering from surgery. Ford decided not to return to Washington but directed the cabinet to formulate a strong response. With this tasking, Kissinger chaired a meeting of the Washington Special Action Group (WSAG) late in the afternoon.

The Central Intelligence Agency decided that the attack was premeditated. Although Pyongyang did not want war, it was looking for an excuse that Kim Chong Il could use at the Non-alignment Movement summit to denounce the United States in an attempt to weaken its resolve over Korea. Moreover, the intelligence briefing indicated that North Korea could engage in further controlled acts of violence, depending on the response to the tree-trimming incident.

Kissinger guided the Washington Special Action Group through various courses of action that would “be a good lesson for them. . . . The important thing is that they beat two Americans to death and must pay the price.” He added, “It will be useful for us to generate enough activity so that the North Koreans begin to wonder what those crazy [Americans] are doing or are capable of doing this election year.” With this mindset, he endorsed some options, deferred others, and ignored a third set.⁴

The Secretary of State proposed resurrecting an exercise involving unarmed B-52s flying over Korea. The Department of State had earlier opposed such a move to avoid provoking China. Kissinger urged alerting the bombers, and Admiral James Holloway, the acting Chairman of the Joint Chiefs, agreed. The exercise could be conducted within three days. The Secretary also recommended raising the defense readiness condition, which was striking because it would have been the first time it was changed in response to activity in North Korea. After Holloway explained the impact of going to DEFCON 3, he urged that it be raised that night.

After reviewing other options, the Washington Special Action Group decided to augment United Nations Command with F-4 aircraft from Japan, including Wild Weasels armed with anti-radiation missiles. Other actions would be considered, such as deploying F-111s from the United States, but they would have to await their next meeting, scheduled for the following morning. Finally, the group agreed that the tree must be cut down. It also concluded that Stilwell should

communicate directly with Kim Il Sung; it denied his proposal to protest.

With these decisions, a flurry of messages was released overnight to unified and specified commanders. DEFCON 3 was set for Korea and F-4s were ordered to Osan, B-52s on Guam and

F-111s at Mountain Home Air Force Base were alerted, and the *USS Midway* carrier task group in Yokosuka

was readied for deployment. Meanwhile, both Stilwell and the chargé d'affaires of the U.S. Mission were scheduled to brief President Park on the following day.

Park wanted to teach the North a lesson "without use of weapons"

August 19

American forces went to DEFCON 3 early on August 19. The balance of the day was spent reaching this level. Major General John Singlaub, USA, Chief of Staff, U.S. Forces Korea, noted that other steps to enhance readiness quickly followed:

Nuclear and conventional artillery and missiles of various calibers were carried forward by road and helicopter to prepared concrete bunkers. Listening posts just south of the DMZ were activated and reconnaissance patrols were mounted. . . . A quick scan of tactical radio net produced a multi-band cacophony of Korean and American voices. This was obviously not a training exercise.⁵

Pyongyang sent conflicting signals but its media remained defiant, faulting Washington for provoking the incident as a pretext for war. Comments before the Military Armistice Commission on August 19 presented a similar view, including a claim supported by photographic evidence that its soldiers had also been injured.

North Koreans taking axes from work crews.



U.S. Army

Despite its bravado in public, the communists reacted defensively to the increased defense readiness condition. Kim Il Sung put the army, Worker-Peasant Militia, and Red Guard Youth on a war footing. Pyongyang conducted civilian air raid drills on August 20. While divisions along the demilitarized zone were immobile, naval and air force units went on alert. A total shutdown in tactical air activity began on August 18 and continued until August 23, perhaps because of the inclement weather in the North. These actions were characterized by Stilwell as "reactive, urgent, and defensive," indicating "genuine apprehension over possible UNC retaliatory military actions."

Meanwhile, Stilwell met with Park, who concurred with American actions. Deliberate and calm throughout the meeting, Park wanted to teach the North a lesson "without use of weapons." Referring to the posturing by Washington after the seizure of *USS Pueblo*, he warned that a show of force by itself would not persuade. He warned that United Nations Command must be fully prepared should North Korea attempt to prevent the tree from being cut down. To guarantee that outcome, Park offered to integrate 50 special forces who had multiple black belts into the ranks. When Stilwell suggested that the operation might occur too quickly for the North to respond, Park opined that it would be better to conduct an operation that punished the KPA guards without using firearms. Stilwell agreed to consider the offer, and ultimately these special forces personnel were integrated into the operation as regular liaison soldiers.

A preliminary plan emphasizing speed and surprise was completed that night. An engineer force with 50 to 60 unarmed ROK soldiers would conduct the operation on or after August 21. Backup would include the authorized 35-man security force, an infantry company from 2^d Infantry Division stationed near the joint security area, a Korean infantry company, a Korean or American rifle company in UH-1 helicopters over the southern approach to the demilitarized zone, and a task force of one mechanized infantry and two tank companies located south of the Imjin River. The operation would take 45 minutes and commence between 0720 and 0730 hours.

Stilwell also addressed the risk of escalation, a concern that was raised in Washington on August 19. If the communists threatened to defeat the South Korean special forces unit, Stilwell would introduce the American rifle company with clubs to allow ROK troops to withdraw. If the North resorted to pistols, United Nations Command "could respond with mortar and artillery fire on known or suspected North Korean installations



U.S. Army

Attackers dispersing.

just outside the joint security area to allow the UNC troops to withdraw from the fight.” However, if the North actually attempted to overrun the joint security area in a concerted ground attack, Stilwell warned it would be “ill advised” to try to stop the onslaught in this particular area. He recommended using the backup forces to facilitate withdrawal of U.N. forces from the joint security area while delivering heavy artillery fires on KPA targets outside the area: “If the other side starts shooting, the mission becomes one of rapid extraction of our forces from close contact, relying primarily on artillery covering fires.”⁶

The WSAG meeting on August 19 began with a contentious discussion of possible actions. Kissinger had heard radio reports on a Pentagon statement that military action was inconceivable. Determined to signal U.S. anger, he warned that “the President will hit the ceiling when he hears that, because I told him we would be discussing possible military actions and that is what the President wants.” On that note, the Secretary repeatedly steered the meeting to military responses with admonitions on failing to act: “If we do nothing they will think of us as the paper tigers of Saigon. . . . If we do nothing there may be another incident and then another.”⁷

The Washington Special Action Group reviewed the proposed B-52 missions. Holloway explained that the aircraft would fly from Guam to within 43 miles of the demilitarized zone and drop their radar bombs before returning. To ensure that North Korea discovered the bombers, the Joint Chiefs would have them fly high enough to be detected on radar. Kissinger agreed to clear the proposal with the President. Meanwhile, F-111s and the *USS Midway* task group deployed.

Holloway then went through a list of other measures to be implemented coincident with or independent of efforts to chop down the tree, including firing an Honest John surface-to-surface missile or artillery barrage. Both suggestions had disadvantages: the former was inaccurate and the latter invited counterfire. Nevertheless, Kissinger asked the Joint Chiefs to consider artillery fire against the communist barracks just outside the joint security area.

The Deputy Secretary of Defense, William Clements, offered another option as the meeting continued: a SEAL operation against an unspecified target along the west coast of North Korea. “They would be wondering what happened and who did it.” Holloway balked. He believed that this option posed a danger: “If we pick a target which is significant in their view we would have a 50 percent chance of doing it without getting some people killed. The North Koreans are in a high state of alert. . . . we might have difficulty getting the guys out.” Kissinger remained focused on the artillery barrage.⁸

This last WSAG meeting ended with a decision to continue contingency planning and move the F-111 aircraft and *USS Midway*. The group sensed the need to do something quickly and have precise guidance for Stilwell in case the situation escalated. But an exchange between the Secretary and one member revealed the concern that events could get out of control. Kissinger opined, “One always assumes the unlimited willingness of opponents to take risks. . . . We are 200 million people and they are 16 million.” In response the Deputy Assistant Secretary of Defense for East Asia and Pacific Affairs, Morton Abramowitz, said, “They could overawe us locally.”⁹

The Deputy National Security Advisor, William Hyland, observed that strong differences existed in Washington over the plan developed by Stilwell. He reported that the Joint Chiefs supported the plan:

*out of loyalty to the field commander and in recognition that we must make a strong show of manhood in an area we were driven out of two days ago. The Chiefs, however, recognize that there are severe risks and there could be casualties. Bill Clements does not support the Stilwell plan; he feels it will lead to a major fight and that the Koreans are in effect baiting an attack. . . . The third option would be to ignore the tree and [later] attack the North Korean barracks with artillery fire. A further option unanimously opposed by Clements, the Chiefs, and I think Habib would be to conduct an artillery attack at the same time we were chopping down the tree. . . . A final option would be to conduct the Stilwell tree chopping plan and, if it runs into trouble, to withdraw and then attack the North Korean barracks with artillery.*¹⁰



U.S. Army

U.S. soldiers returning two days later.

The proposal to shell the barracks was reviewed by the Joint Chiefs, who cautioned against it in a starkly-worded memorandum.

Stilwell and Singlaub shared the concern “that the operation stood a fifty-fifty chance of starting a war”

While there was sufficient artillery for the mission (batteries along the demilitarized zone could destroy the target with a hundred rounds), resorting to artillery during the operation would

leave the force vulnerable to retaliatory fire. Moreover, the barracks would probably be vacant. More critical, the communists enjoyed a 4 to 1 ratio in artillery tubes in the immediate area.

Implementing the Plan

Despite these differences, Washington adopted the plan on August 19. The Joint Chiefs approved the proposal from Stilwell with guidance that it be conducted “quickly and aggressively” starting at 0700 hours (local time) on August 21. They also agreed that two KPA drop barriers should be eliminated unless it delayed the cutting operation or increased risks. The same message directed Strategic Air Command to initiate B-52D training sorties along the demilitarized zone at 0630 hours on August 21. The first cell of three bombers would fly at medium to high altitudes to facilitate radar detection. The flights would continue through August 25 with a daily visit by a cell. U.S. Pacific Command would protect the bombers using fighter combat air patrols.

United Nations Command likely received the flash precedence approval message from the Joint

Chiefs at midmorning on August 20. That afternoon, five groups of four F-111s would start arriving in Osan from Idaho. The F-4 squadron had arrived the previous day. The carrier task group would be underway for the Tsushima Straits within the next few hours, comprising *USS Midway* and its air wing, four frigates, and a cruiser.

Stilwell completed the planning and movement of forces in country. Under the final plan, according to Singlaub, disparate units had to move simultaneously:

Altogether, a force of 813 men would be involved. . . . Task Force Vierra . . . would conduct the actual tree cutting . . . three batteries of American 105mm howitzers were to be moved across the Freedom Bridge north of the Imjin River. Another three batteries of ROK heavy artillery would be positioned just south of the river in clear view of North Korean positions. The gunners, Stilwell said, would have “rounds in the tube and hands on the lanyards.”¹¹

And a lot of events would be occurring simultaneously in the air. Singlaub continued:

[A] reinforced composite rifle company . . . would be orbiting aboard twenty Huey helicopters a few hundred meters south of the DMZ, supported by twelve AH-1G Cobra gunships. Tank-busting F-4 Phantoms would be prowling at a slightly higher orbit. F-111 medium strategic bombers would orbit still higher, and be clearly visible to Korea radar. . . . At the precise moment of the tree chopping . . . B-52 bombers from Guam would be moving ominously north up the Yellow Sea on a vector directly to . . . Pyongyang. In the Sea of Japan . . . [USS] Midway would launch forty aircraft that would vector north above international waters.¹²

Stilwell and Singlaub shared the concern over escalation. As the latter subsequently noted, “It was my estimate, shared by many of the staff, that the operation stood a fifty-fifty chance of starting a war.” If the communists attacked and tried to overwhelm the tree-chopping forces, Stilwell planned for rapid extraction of the team under artillery covering fire.

On the evening of August 20, key members of the UNC staff manned the command center in preparation for the next morning. To preclude Washington micromanagement, they cut potential communications links between the President and subordinate commands.

For Washington, the balance of the day passed uneventfully now that the key decisions were made. However, two F-4Es equipped with GBU-15 laser guided bombs were ordered to fly to Osan. The Joint Staff considered destroying the poplar tree or a North Korean target with the guided bombs, and the aircraft may have been sent with that in mind.

Enter Paul Bunyan

The tree chopping was planned to start at 0700 hours, August 21 (1800 hours, August 20, Washington time). The North Korean guards appeared surprised and did not interfere. Although at one point 50 KPA soldiers gathered just outside the joint security area, they did not enter it.

Pyongyang immediately demonstrated a more conciliatory attitude, requesting a meeting of the Military Armistice Commission only hours after the tree was chopped down. In the 15-minute conference, the senior KPA officer delivered a high-level message to Stilwell flagged from Kim Il Sung as supreme commander. It admitted that "It is regrettable that an incident occurred." It proposed that "an effort must be made so that such incidents may not recur. . . ." In a second note, the KPA representative added that the tree trimming was a serious provocation. The embassy commented that the meeting was "calm and quiet." The national-level review also commented that the letter from Kim Il Sung was "exceptionally mild, almost conciliatory in tone."

North Korean media also avoided escalation. The authoritative *Nodong Simmun* stressed keeping the peace and coverage of the incident became somewhat more restrained. Nevertheless, United Nations Command pushed for punishment of those guards responsible for the murders and guarantees that the incident would not be repeated. Pyongyang counterproposed that personnel on both sides be physically separated along the demarcation dividing North and South. Guards would henceforth be located only in their respective zones of responsibility. North Korea would remove guard posts and barrier gates from the UNC portion of the joint security area but

would need its own access road. On September 6, 1976, the sides agreed to the basic division.

Pyongyang remained on a heightened state of alert as negotiations continued in part because U.S. Forces remained at DEFCON 3. Yet within days of chopping down the tree, Commander in Chief, Pacific Command, and the Joint Chiefs began thinking about an end to the crisis. Training sorties by B-52s over Korea dropped from daily to weekly. Only two or three bombers would fly in each cell, and F-4 aircraft equipped with GBU-15 bombs departed in early September.

The Joint Chiefs evidently tried to release other assets to DEFCON 4. The Kadena-based F-4 contingent would soon depart but leave its Wild Weasels behind. Along with 14 of the 20 F-111s, these aircraft would depart in mid-September. The six remaining F-111s would deploy to Australia for an exercise in October. The *USS Midway* carrier task group would remain on station in the southern approaches to the Tsushima Strait.

Singlaub ordered U.S. Forces Korea to remain at DEFCON 3 until September 8, when the North agreed to a set of new security procedures for the joint security area. With the lowered defense readiness condition, *USS Midway* returned to Japan.

Lessons Learned

A formal apology on the part of North Korea is rare. How did the United States manage to get one? While at the time many decisionmakers believed the incident was deliberate, some saw the American deaths as an accidental rather than willful act. And still others thought that the event was a provocation that got out of control. Since Kim Il Sung had not planned for the situation to result in the loss of life, he could admit that it was regrettable. He did not have a vested interest in opposing or retaliating for cutting down the tree.

The operation succeeded because the standard of success was low. The United States did not expect a reaction by the communists other than passivity as the tree was felled. No reparations or return of crewmen had to be negotiated.

Ironically, one of the last crises Kissinger faced involved the same country as the first. As National Security Advisor, he had helped formulate the response to the downing of an EC-121 reconnaissance aircraft in April 1969. To be credible, he said the United States must react to provocations quickly, even when the desired forces are not available. Accordingly, he originally pushed to chop down the tree on August 20 and was determined to avoid the impression of posturing like earlier responses in similar crises.

The Secretary of State knew what he wanted out of the WSAG meetings. While endorsing the chopping down of the tree, he proposed other

Engineers cutting down disputed tree.



U.S. Army



U.S. Army

Securing the area.

measures, such as increasing defense readiness and B-52 training missions. Kissinger simply ignored more extreme courses of action proffered by the Joint Chiefs. Both the relatively small nature of the provocation and the desire to avoid escalation were partly responsible for limiting the scope of potential reactions.

Planning for responses to the incidents involving *USS Pueblo* and the EC-121 aircraft was complex because the options ranged from shooting down fighters to attacking every North Korean fighter base. A simple plan was selected to chop down the tree. The hardest part, moving ground forces into position, was firmly controlled by the land component commander. Organizing B-52s, F-4s, and F-111s did not appear that difficult. But if the Joint Chiefs had intended to direct the capabilities in the theater, doctrine and planning would have been severely tested. However, since artillery was the weapon of choice in the event of escalation, contingency planning by one service was much easier to execute.

Recalling the micromanagement by officials in Washington who had reacted to the seizure of *Mayaguez* the previous year, Stilwell took steps to head off the tendency to skip echelons in the command and control system with high-level queries.

The response to the tree-trimming incident succeeded because it was well planned, simple, and executed to achieve surprise. The operation generated sufficient forces and a state of readiness

to deter escalation. Moreover, President Ford restrained the communists by taking the unusual step of increasing the level of defense readiness. And for a leader whose center of gravity was his army, Kim Il Sung was far more threatened by this development than by naval and air operations following the capture of *USS Pueblo* and loss of the EC-121 aircraft. The Nation had learned from its earlier encounters with Pyongyang. **JFQ**

NOTES

¹ These events are recounted in John K. Singlaub, *Hazardous Duty: An American Soldier in the Twentieth Century* (New York: Summit Books, 1991).

² Central Intelligence Agency, "DMZ Incident," August 18, 1976, Presidential Country Files for East Asia and Pacific (Ann Arbor, Mich.: Ford Presidential Library), box 10.

³ *Ibid.*

⁴ Minutes of Washington Special Action Group, "Korea-North Korea Tree Incident 8/18/76 (2)," August 19, 1976, Presidential Country Files for East Asia and Pacific (Ann Arbor: Ford Presidential Library), box 10.

⁵ Singlaub, *Hazardous Duty*, pp. 371-72.

⁶ Message from Richard G. Stilwell, "Joint Security Area Incident," August 19, 1976, Presidential Country Files for East Asia and Pacific (Ann Arbor, Mich.: Ford Presidential Library), box 10.

⁷ Minutes of Washington Special Action Group, August 19, 1976.

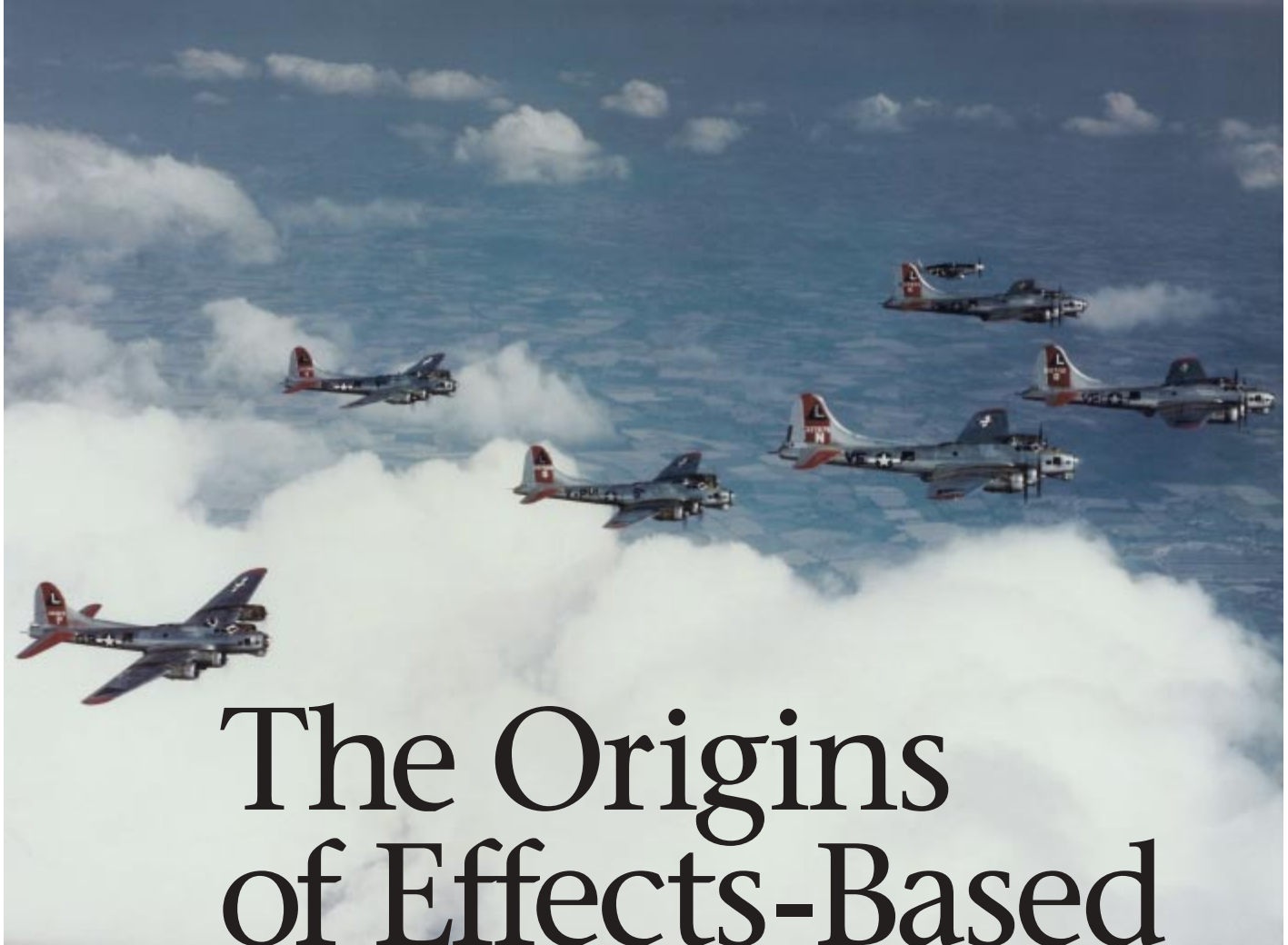
⁸ *Ibid.*

⁹ *Ibid.*

¹⁰ Memorandum from William Hyland to Brent Scowcroft, "Korea-North Korea Tree Incident 8/18/76 (2)," August 19, 1976, Presidential Country Files for East Asia and Pacific (Ann Arbor, Mich.: Ford Presidential Library), box 10.

¹¹ Singlaub, *Hazardous Duty*, p. 373.

¹² *Ibid.*, p. 373.



National Air and Space Museum

The Origins of Effects-Based Operations

By PHILLIP S. MEILINGER

Effects-based operations are defined by U.S. Joint Forces Command as “a set of actions planned, executed, and assessed with a systems perspective that considers the effects needed to achieve policy aims via the integrated application of various instruments of power.” The success of any military action is calculated in terms of furthering political objectives.

Airmen have always aspired to conduct effects-based operations, although they did not use that term. During most of World War II, the analytical, cognitive, and intelligence tools needed to determine the effectiveness of air operations were lacking on the strategic level. As a consequence, airmen began doing what they could by resolving a torrent of tactical and technical problems. They counted things, substituting quantification for evaluation. In addition, they assumed that enemies were a mirror image of themselves. Today there are more efficient ways of evaluating effects-based operations, yet there is still a search for a methodology to apply them.

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National Archives

Under Allied bombs, 1944.

Lieutenant Colonel Edgar Gorrell of the Army Air Service wrote the first American concept paper regarding strategic bombing while serving in France during World War I. It was strikingly similar to the work of air theorists during World War II. More importantly, Gorrell touched on the precepts of effects-based operations. He noted the stalemate on the Western Front and the toll inflicted on the Allies by German artillery. But the millions of enemy shells that rained down were made at only a few factories. If they were eliminated, production would cease. In other words, if the desired effect was silencing enemy guns, attacking German ammunition plants would have

the same effect as destroying artillery tubes. The same was true of other critical war industries.

Gorrell argued that there were a few indispensable German economic targets without which the war could not be fought. Though vague about targets, he identified four industrial regions.¹ Those who followed him in the next two decades did little better. Billy Mitchell wrote simply that air forces could strike “manufacturing and food centers, railways, bridges, canals, and harbors.”²

A Metaphor of Air War

The doctrine with which the United States went into World War II largely offered lists of standard targets. Army Field Manual 1-5, *Employment of Aviation of the Army*, stated “important objectives may be found in the vital centers in the

all targets are not created equal

enemy’s line of communication and important establishments in the economic system of the hostile country.” Besides focusing on enemy forces, this publication suggested targets such as rail lines, bridges, tunnels, power plants, oil refineries, and similar objectives. But more imaginative ideas were germinating elsewhere.

Two events occurred at the Air Corps Tactical School, one minor and out of proportion and the other more significant. The instructors-cum-pilots at the school found their planes grounded.

Springs in the propeller assembly had failed and replacements were back ordered. The parts were made in Pittsburgh, but the factory was closed because of floods. This seemed significant. If one wanted to achieve air superiority, perhaps it was only necessary to destroy one factory rather than every enemy airfield or aircraft.

Although this scenario may appear too simplistic as a basis for military doctrine, there was more to it. America and much of the world experienced the Great Depression during the 1930s. Businesses and financial institutions failed. Major powers were brought to their knees without a shot being fired. Economies are delicate systems. If the desired effect is rendering an enemy incapable of waging war, strategic bombardment may devastate its economy. Victory may follow. But infrastructures are huge and one might not be able to attack every factory, power station, rail line, bridge, and steel plant. What targets are the most important or vulnerable? The example of propeller springs provides a clue because it implies there are key nodes within an economic system on which it depends. All targets are not created equal. The springs became a metaphor for a way of looking at air warfare—the search for the strategic bottleneck.

Prior to World War II it was difficult for airmen to obtain information on the economies of potential enemies. There were no resources for such intelligence, and American isolationism made such an endeavor inappropriate. Instead, the officers at the Air Corps Tactical School looked at the industrial northeast and gathered data on power grids, steel mills, oil refineries, and transportation systems. Even more significantly, they tried to discover how systems worked. In short, air leaders had an inherent belief in the importance of effects-based operations and a rudimentary understanding of how systems should be measured and evaluated. They did not, however, have the analytical tools to conduct that measurement and evaluation.

When Europe went to war in September 1939, an air war plans division was established in the War Department to devise target sets in the event the United States entered the war. The initial effort was small and hesitant, but businessmen, engineers, and other members of the private sector were soon contacted. In some cases they studied factories in Europe that American banks helped finance or construction companies helped build. In others, experts simply explained how U.S. systems operated, assuming that those in Germany were similar. This was largely a hit-or-miss approach, often depending on businessmen. There was an obvious risk of what can be called the blueprint availability syndrome, in which the type of intelligence gathered shapes one’s view of

"A Bridge Too Far."



National Archives

a system. If planners had ample data on the German ball bearing industry, they might put too much emphasis on its contribution to the war effort while missing other target systems.

Other bodies were formed to study the German economy. One was a group of American business executives, lawyers, and economists who were known as the Committee of Operations Analysts and another was the Enemy Objectives Unit in London, which advised Allied air leaders for the balance of the war.

These groups studied the German economy to determine the most lucrative targets for air attack. Unfortunately, they lacked the data to make reasoned judgments. As the official history of Army Air Forces put it:

... there existed in almost every instance a serious shortage of reliable information, and the resulting lacunae had to be bridged by intelligent guesswork and

the clever use of analogies. In dealing with this mass of inexactitudes and approximations the social scientist finds himself in a position of no special advantage over the military strategist or any intelligent layman; and an elaborate methodology may even, by virtue of a considerable but unavoidably misdirected momentum, lead the investigator far afield.³

To overcome these limitations, analysts initially looked for information in enemy newspapers and periodicals as well as from business and industrial experts as noted above. Such poor sources led to the misconception that the German economy was hard pressed and thus was susceptible to attack with devastating results. For most of the war Germany actually had remarkable slack. Because Allied economies had been put on a wartime footing, it was assumed that the enemy had as well. But in fact, it had not. For example, automobile manufacturing, the largest industrial sector of the German economy in 1930s, barely ran at half capacity.

Measures of Merit

Economic analysts became increasingly capable of understanding effects-based operations. This was due partly to their criteria and methodologies for gathering information on the German economy, accessing it, and then looking at targets. They examined factors such as total production of a given commodity, minimum operational requirements, surplus capacity, ability to substitute other materials, time needed to repair facilities, damage sustained, and the ratio between pool and production. The last factor identified

essentially, measures of merit linked objectives to targets

commodities that could be stockpiled for an appreciable time. Thus oil was initially considered a large pool, so its destruction would have little immediate effect. Similarly, U-boat production was slow, with most submarines on active service or in port. Thus hitting the factories that manufactured them would not be decisive. On the other hand, aircraft were expended quickly in combat and there was no pool on which to draw. Destroying the plants that built them would have a rapid effect.

Once planners determined key nodes, industries, and commodities, they had to answer two questions. Were air strikes destroying the targets? If they did, were they having the predicted ripple effect throughout the war machine?

Estimating if bombers were actually destroying their targets was difficult. Data on accuracy was hard to obtain, and the extent of destruction when bombs hit was not obvious. Like today, assessing bomb damage was as much art as science. Post-strike aerial photography, for example, indicated that attacks on ball bearing factories in Schweinfurt in 1943 caused extensive damage. After the war, however, it was learned that many bombs detonated on top of buildings, collapsing the roofs. The results looked impressive from the air, but only 5 percent of the machines on the floor were damaged and most were quickly repaired.

Beyond this level of analysis, intelligence and planning agencies had to confront the subject of indirect effects, which required measures of merit. Although the term was popularized earlier by the total quality movement, the concept was understood in World War II. Essentially, measures of merit linked objectives to targets. But the specific type of evidence analysts should examine to determine if targeting strategies were achieving their political goals remained a thorny issue.

The Tedder Plan

At Casablanca in January 1943, Franklin Roosevelt and Winston Churchill agreed that the objective of the combined bomber offensive was “the progressive destruction and dislocation of the German military, industrial, and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened.”⁴

This was a highly and perhaps deliberately ambiguous directive that allowed readers to take away from it what they wished. Air Chief Marshal Arthur Harris of Bomber Command saw the order to undermine enemy morale as a vindication of night area-bombing. To Lieutenant General Carl Spaatz, senior American air commander in Europe, the operative phrase was “the progressive destruction” of economic and industrial infrastructure—the mission of daylight precision bombing. General Dwight Eisenhower, who became Supreme Allied Commander for Overlord, was focused on the need to invade. In his view, the main function of bombers was supporting the assault on the French coast to ensure that “armed resistance was fatally weakened.”

By early 1944, planning for the invasion was in full swing, and the question of a combined bomber offensive to complement landings arose. American analysts revised estimates of German oil supplies and decided reserves were not as large as originally thought. If true, refineries should become the top priority for Allied bombers. If the lifeblood of the economy stopped pumping, the entire war machine would collapse—one of the stated goals at the Casablanca conference.

Other air planners focused on the German rail network. Troops, supplies, equipment, and raw materials moved primarily by train. If railway lines were cut, the German war machine would come to a halt together with the entire economy. The debate tended to break along national lines, with Americans backing the oil plan and most British, notably Air Chief Marshal Arthur Tedder, deputy supreme Allied commander, advocating the rail plan.

The argument ended in March 1944 when Eisenhower opted for the rail plan. The deciding factor was time. For Ike, measures of merit required air superiority to isolate the beachhead area from enemy reinforcements. He wanted that capability for the invasion and not at some point in the following weeks. Although he agreed with Spaatz that the collapse of the oil supply would be catastrophic for the German war machine, that could not be expected until the autumn, too late for Normandy. The rail plan won the day because it promised a solution to immediate problems—the effects desired by Eisenhower.



National Archives



Planning air operations.

Yet there was even disagreement on the rail plan. If the desired effect was halting traffic, what parts of that system should be targeted? Possibilities included rail cars, locomotives, repair facilities, round houses, marshalling yards, and railway bridges.

Solly Zuckerman, a primatologist in the University of Oxford before the war, worked for Tedder in the Mediterranean theater. He studied railroad bridges versus marshalling yards in Sicily and on the Italian mainland in 1943 and concluded that the latter were more desirable targets simply because they were larger. Given the inaccuracy of Allied bombers, bridges were small and took disproportionate tonnages to knock out. Because the marshalling yards were expansive, bombers were more likely to hit something of value, thus bombing these yards was more efficient.⁵ Tedder agreed and directed his planners accordingly.

When Tedder and Zuckerman left the theater, Lieutenant General Ira Eaker, USA, the new commander, reviewed the decision. He concluded

that Zuckerman was mistaken. By using more data on air operations in his sample, Eaker discovered that bridges were not as difficult to hit as previously thought, especially with medium rather than heavy bombers operating at high altitudes. In addition, marshalling yards could often be repaired within days while it generally took several weeks to repair a bridge.

These findings became important as planners grappled with preparations for Overlord. If the desired effect was isolating the beachhead by preventing German reinforcements from reaching the area—Eisenhower's goal—how best could airpower achieve it? Tedder and Zuckerman, now in London, dusted off their earlier analysis and again pushed for marshalling yards. Spaatz and his planners, led by Charles Kindleberger and Walt Rostow of the Enemy Objectives Unit, disagreed. Using extensive analysis from the Mediterranean, they argued for a bridge campaign.

Like the broader question of oil versus rail, the more specific issue of railways generated bitter debate for the next four decades. In the event, air leaders resolved the dilemma in their usual manner by bombing both marshalling yards and bridges. There was enough Allied airpower by mid-1944 to follow several targeting strategies. By

D-Day, Ninth Air Force alone, with more than 4,000 aircraft, was larger than the entire combat strength of the *Luftwaffe*.

It would be unwise, however, to pass over this question too quickly. Determining whether Zuckerman or the Enemy Objectives Unit was correct had more than academic interest. Planners will not always have infinite air assets at their disposal. As seen over the past decade, those assets may be limited by political considerations and not a lack of airframes. In such cases, air planners should know how to achieve the greatest effect to fulfill policy objectives.

Picking the Right Objective

Zuckerman and Rostow published memoirs after the war, attacking each other with gusto. Their supporters and detractors entered the fray, but one of the more insightful accounts came from Henry Lytton, an economist on the War Production Board and the Economic Warfare Board. It is not just his conclusions on the relative importance of bridges versus marshalling yards that are of interest, but his insights into the methodology and assumptions of the respective protagonists.⁶

Lytton considered what were being used as measures of merit. Zuckerman was interested in the density of bomb patterns within designated target areas. Marshalling yards were large; thus a much higher percentage of bombs fell in that area than when the target was a small rail bridge. Kindleberger and Rostow were more concerned with effects. If only one bomb out of a thousand hit a bridge and dropped it, that was preferable to having all the bombs landing within the confines of a marshalling yard and leaving even one rail line intact. The enemy assessment was the same. The German officer in charge of the Italian transport system stated that strikes on marshalling yards destroyed goods and rolling stock but not tracks, which in any event could be quickly repaired.

In short, the objective was stopping trains, not putting a certain percentage of bombs within a grid. Choosing the wrong measures of merit will defeat effects-based operations. In early 1945, Tedder received unexpected support. The Allies had broken the Enigma codes and produced what was called Ultra intelligence. However, the German rail system, which had been using teletype or telephone to transmit reports, began using Enigma in January 1945. Signals intelligence personnel largely ignored messages on rail traffic,

but when Enigma was adopted, they paid more attention. By February, a study of the traffic revealed the role coal played in the economy, virtually powering all industries and providing 90 percent of energy supplies. Coal moved almost exclusively by train once the rivers and canals were mined by Bomber Command. When the rail plan took effect, coal movement slowed down. The implication was clear: to deliver a death blow to German industrial production and military capabilities, the Allies had to stop the flow of coal. That meant stopping the trains.

In essence Tedder had been right all along, only for the wrong reasons. Neither he nor his planners identified coal as the commodity that made the enemy function. His plea for a campaign against German railways (as opposed to those in France, which had been the centerpiece of pre-invasion bombing) emphasized disruption of the flow of reinforcements and supplies. The goal of an expanded rail campaign was to “rapidly produce a state of chaos which would vitally affect not only the immediate battle on the West Wall, but also the whole German war effort.”⁷ Since coal was never mentioned, Tedder was not interested in studying intelligence related to its shipment.

But when examined almost by accident in February 1945, the significance of coal quickly became apparent. The evidence had been there all along; it merely required someone to establish coal as the crucial link and identify the desired effect with an appropriate measure of merit—halting its movement by rail. Once this key relationship, desired effect, and metric were articulated, the bombing campaign could be focused on achievement.

A further consideration highlights the sometimes serendipitous nature of war. The railway system did not adopt the Enigma code to secure its reports at such a high level of classification, but because bombing had knocked out the teletype network as well as most telephone lines and even the postal service. Otherwise Enigma probably would not have been used, and the Allies would never have been curious enough to look into the movement of coal by train.

Technological War

Although targeting was a key factor in effects-based operations in World War II, questions remain. Was there a particular node the heavy bombers should have concentrated on? Contenders for this magic bullet were oil, coal, rail lines, electricity, and ball bearings. Were these targets really key or *panacea targets*, the derisive term of Arthur Harris? In his view, the German economy was so large, complex, and redundant that only its wholesale destruction would bring the country to its knees.

**the wrong measures of merit will
defeat effects-based operations**



National Archives/U.S. Army Air Forces

Raid on Germany.

The German perspective on the Allied air offensive is instructive. Albert Speer, Minister of Armaments and War Production, later wrote:

I shall never forget the date May 12 [1944]. . . . On that day the technological war was decided. Until then we had managed to produce approximately as many weapons as the armed forces needed in spite of their considerable losses. But with the attack of nine hundred and thirty-five daylight bombers of the American Eighth Air Force upon several fuel plants in central and eastern Germany a new era in air war began. It meant the end of German armaments production.⁸

On the other hand, Speer later wrote Hitler about the bombing of rail lines on the Ruhr:

We are on the verge of the most serious coal production crisis since the beginning of the war. . . . For more than six weeks now, in the matter of transport the Ruhr has become more and more cut off from the areas it supplies. . . . It is clear from Germany's overall economic structure that in the long run the loss of the industrial area of Rhineland-Westphalia would be a mortal blow to the German economy and to the conduct of the war.⁹

Further confusing matters, when Speer was interrogated following the war, he stated that the crucial targets that should have been attacked more vigorously were chemicals, ball bearings, and electrical power, implying that they were more important than oil or coal. It would seem that not only were the Allies uncertain about the

economy of Germany, but the head of its armaments production was confused.

While effects-based operations were at the root of what airpower was intended to achieve, planners went to war without precedent for determining objectives, targets, and measures of merit for strategic bombing. At the same time they had almost no experience in gathering intelligence for such campaigns. These processes, both requiring substantial resources and skill, had to be created anew. Although mistakes were made, one must not underestimate the task of collecting economic intelligence and then planning and conducting an economic warfare air campaign.

Analytical tools have improved dramatically. Unfortunately, questions over effects-based operations persist: the adequacy of intelligence, the lack of cultural sensitivity, the risk of studying inputs rather than outputs, and the need for models to account for cognitive, cultural, political, and social factors. These are serious questions, and their solutions are not obvious.

Airmen have always desired to conduct successful effects-based operations. For much of the first century of airpower that aspiration was out of reach because of technological limitations on aircraft and weapons as well as inadequate intelligence and analytical tools. Now those tools and technology are beginning to catch up. **JFQ**

NOTES

¹ Maurer Maurer, *The U.S. Air Service in World War I*, volume 2 (Washington: Office of Air Force History, 1978), pp. 141–57, reprints the Gorrell memorandum.

² William L. Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power, Economic and Military* (New York: Putnam's, 1925), pp. 126–27.

³ Wesley Frank Craven and James Lea Cate, *The Army Air Forces in World War II*, volume 2 (Chicago: University of Chicago Press, 1948–58), p. 369.

⁴ *Ibid.*, p. 305.

⁵ Solly Zuckerman, *From Apes to Warlords* (New York: Harper and Row, 1978), pp. 209–10, 220–23.

⁶ Henry D. Lytton, "Bombing Policy in the Rome and Pre-Normandy Invasion Aerial Campaigns of World War II: Bridge-Bombing Strategy Vindicated—and Railway Bombing Strategy Invalidated," *Military Affairs*, vol. 47, no. 2 (April 1983), pp. 53–58. Lytton's title pretty much says it all.

⁷ Charles Webster and Noble Frankland, *The Strategic Air Offensive Against Germany, 1939–1945*, volume 4 (London: Her Majesty's Stationery Office, 1961), pp. 290–92, contains Tedder's "Note on Air Policy to be Adapted with a View to Rapid Defeat of Germany," dated October 25, 1944.

⁸ Albert Speer, *Inside the Third Reich* (New York: Macmillan, 1970), p. 346.

⁹ Webster and Frankland, *The Strategic Air Offensive*, pp. 349–56, contains a letter from Speer to Hitler dated November 11, 1944.



1st Marine Division Combat Camera (Brian L. Wickliffe)

Systems Integration and the New American Way of War

By PAUL BRACKEN

There is a new American way of war. As seen in Afghanistan and Iraq it involves winning with smaller, more agile forces, where jointness and networking combine to produce large-scale gains in warfighting. Using this experience to transform the defense and intelligence communities for networked operations is one of the biggest managerial challenges ever undertaken.

Many plans focus on building blocks like doctrine, organization, and technology. That is

necessary, but it leaves out one critical element—how the blocks are put together. In a networked force it is more important than ever to ensure proper coordination and timely integration of assets. This is what gives the big payoffs.

Transformation involves various building blocks and different ways of combining them, here designated as systems integration. But organizational skills and capabilities for systems integration have not kept pace with the requirements of the new way of war. Current frameworks and tools reflect the industrial era when most of them were created. That world no longer exists; new approaches are needed.

Instead of focusing on systems integration, transformation is too often regarded as a choice

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between incremental and revolutionary approaches to change. Stated in these terms, the incremental approach often wins out because it appears to be less risky and radical.

But these choices—incremental versus revolutionary change—offer an inadequate concept of transformation. Overlooking the interdependence of the building blocks ignores one key aspect of networked operations. The sharply increased degree to which military tasks are carried out by different organizational

incremental change has been the historical approach to military transformation

units amplifies the importance of coordination. Without it, each unit will go it alone, thereby losing the tremendous benefit of networking. The incremental-revolutionary model all but guarantees a lopsided organization whose performance is limited by its least effective parts. Systems integration tools must be sharpened and a systems integration framework should replace the choice between incremental and revolutionary approaches to transformation.

Alternative Paths

The incremental-revolutionary model misses a key feature of networked operations: change in one part of the organization affects other parts. This is true in combat operations, acquisition, and intelligence. An incremental or evolutionary approach tackles problems serially through small-scale improvements in existing processes and technologies. The focus is on local expertise, and the changes are small enough that outside organizational units are not usually involved.

By contrast, the revolutionary or radical approach involves strategic leaps to overhaul an organization across the board, which may mean changing doctrine, organization, and technology simultaneously. This approach requires extensive financial and intellectual capital: sizable budgets because projects are expensive and intellectual capital because risks are high. Consultants, technical experts, strategic planners, and others are necessary to advise leaders about the risks.

AT&T in the 1990s offers an example of revolutionary transformation. It undertook radical change in its core technology, moving to digital fiber optics from copper analog circuits. A new CEO revolutionized the personnel system, terminated 60,000 employees, and made it obvious that loyalty to workers was a thing of the past. The corporation entered a new business area, cable television, taking on massive debt in the process.

The result was indeed a revolutionary transformation of AT&T. But despite hiring the best

and the brightest investment bankers, strategic planners, and technical experts, the transformation nearly destroyed the firm. In five years it became a pale image of its former self and was forced to auction off key divisions at fire sale prices to avoid bankruptcy.

Organizations can only manage so much change at a time. Most leaders understand this, and that is why, practically speaking, an incremental approach nearly always prevails.

Incremental change has been the historical approach to military transformation. For example, the tank was first introduced without changing the organization or tactics for land warfare. It took nearly two decades after developing the tank for organization and tactics to catch up. Even when they did change during World War II, the German army looked much as it did during World War I, with masses of infantry and horse-drawn supply trains supporting tanks. Similarly, the airplane transformed combat at sea only after years of incremental experimentation. In the United States and Japan fleet battle tactics did not develop until the 1930s.

There are two major problems with an incremental approach. First, military transformation now rests on smaller force structures than the case studies of the tank and airplane. This removes the cushion that reduces risk. The United States developed innovative technologies in virtually every war from the Civil War to Vietnam. But more than technological innovation, America used mass—measured in men and dollars—to batter an enemy into submission. If technology did not do the job, as in Vietnam, mass would, or so it was thought. Large force structures provided a huge redundancy against technological failure. That reduced risk and made the incremental approach safe. Because technological failure was offset by massive force structures, mission success did not depend on the complete success of innovation, whether tanks, laser guided munitions, or armed helicopters.

A second problem is that the Armed Forces are far more tightly coupled than ever before. A breakdown or performance lag in one part of the force could check the performance of the whole organization because of increased interdependency. Networking interconnects the forces and links them to supporting systems, such as logistics and intelligence. That increases performance and the chances of mission success, but it also introduces a risk that was not present in earlier episodes of innovation and transformation—network risk, the chance that some part of the organization will not keep up with the others.

Relatively simple incremental transformation strategies worked in the past because various elements of the military were not tightly coupled.

Monitoring exercise
aboard *USS Coronado*.



U.S. Navy (Andrew Meyers)

Such approaches are not likely to be as effective again, which is important to understand. Historical studies of innovation offer insight into a world that no longer exists, an era of loosely coupled mass forces where change was slow. Bureaucratic resistance was a big obstacle in this world because change threatened established routines.

Although bureaucratic reluctance still exists, it is not the problem it was. The defense and intelligence communities recognize the need for change. They want to do their best, but they are not sure how. The issue is less one of bureaucratic resistance than of factoring a complex problem into digestible bites. These are tasks carried out by linked organizational units. All relevant parts must work together. For example, suppressing enemy air defenses may involve a combination of air, space, and special operations forces. Deciding who does what, when, and how is a factoring problem, meaning it requires breaking down a big problem into manageable parts. Coordination is needed to make the assignment, monitor execution, and synchronize the actions of many sub-units. In such situations incremental approaches to transformation can be dangerous.

Transformation in Japan

One drawback with incremental approaches to transformation is that they nearly always focus attention on assets at hand rather than how they are put together with other building blocks. Because changes are small, they usually do not get a

review by those not immediately involved with them—or if they do, the reviews tend to be cursory rather than disciplined. The focus is honing the asset one knows and optimizing it to perfection. But what happens when tightly coupled units or activities use this approach?

The Japanese electronics industry is a particularly good case since it sparked the fascination of the American business community with incremental approaches to transformation in the 1980s. Japanese electronics companies dominated the world. They came out of nowhere to seize the high ground of innovation in low cost, high quality production.

When the DRAM chip was invented in the United States in 1969, Japan took the idea and put it through incremental product improvements. The five electronics giants—NEC, Toshiba, Hitachi, Fujitsu, and Mitsubishi—copied the approach other Japanese companies used in the 1970s in automobiles, steel, and ships. “Get a good design from anywhere and improve it continuously” was the doctrine. Japan used an incremental approach to pummel its rivals in America and Europe. Its global market share of chip production rose from 26 percent in 1980 to 49 percent in 1990.

But during the 1990s the competitive environment changed. The cheap capital that financed R&D and plant expansion in Japan vanished as its banks nearly went bankrupt from



28th Test Squadron, Detachment 2 (Michael Ammons)

F-16 dropping joint direct attack munition.

Integration Tools

Choosing between incremental or revolutionary approaches is not the right framework for managing transformation. Systems integration, linking separate parts of an organization so weaker ones do not limit improving ones, is key. Since the Armed Forces are moving to more networked operations, this approach can be applied throughout the defense and intelligence communities from the highest levels to the lowest.

Three areas for improvement can be identified. On one level they might be considered as mundane parts of nuts-and-bolts activities like outsourcing and software, which usually do not get high-level attention. But downplaying them is a mistake. Poor integration in general, and certainly in outsourcing and software, wastes capital better deployed elsewhere. Moreover, innovations can disproportionately improve the benefits of networking because they crosscut nearly every aspect of military transformation.

The industrial era was built on optimization, not innovation. Competitive advantage came about by grouping production factors in an optimal way, such as steel and labor. Tools of systems integration reflected the loose coupling of assets. The defense budget was restructured using one such tool in the planning, programming, and budgeting system in 1961. Strategic nuclear forces, conventional forces, and logistics were treated as separate factors, the steel and manpower of war. This approach assumed that, like the industrial corporation on which it was modeled in 1947, DOD was a machine whose assets could be separately improved and combined to achieve a seamless whole. What happened in the Air Force, for example, did not much affect the Navy under that kind of integration.

The difficulty was that as complexity and specialization increased, innovation became more important than top-down optimization. But old tools of systems integration, such as optimization and the planning, programming, and budgeting system, had no way to incorporate the payoff from innovations or networked forces. As a result it became harder to allocate resources in a way that encouraged military transformation.

The planning, programming, and budgeting system largely ignores synergies from network effects and understates their payoffs. Its replacement is not a new accounting system, but better horizontal integration to enable innovation. Mechanisms to do that have sprung up in recent years in response to increased complexity and tighter coupling. But they have not been identified in a systematic way to aid in transformation. For example, joint commands, integrated product/process teams, intelligence fusion centers,

overlapping to government-targeted industries. Employment at the big five grew while the economy did not. It became politically impossible to lay off workers.

The American electronics industry staged a comeback in the 1990s by beating the Japanese at systems integration. In U.S. firms, unlike those in Japan, different organizational units—R&D, production, or marketing—were tightly coupled so the interactions among the parts were managed to sharpen competitive advantage.

Japanese companies covered the R&D waterfront. American rivals focused only on those segments in which demand was growing and production advantages existed. Firms guaranteed lifetime employment in Japan. Companies in the United States targeted hiring in specialty skills for the chip business. Japanese firms did everything themselves. American firms competed in key links of the value chain and outsourced the rest.

Incremental change rewards those who understand existing processes. If the environment does not change, and if structures hold stable, that works well. It favors a stable workforce, long production runs, and long-term suppliers. U.S. companies understood both the economic and cultural differences in the American economy: its dynamic labor markets, flexible contracting, and tradition of risk taking. But they did not just recognize them as building blocks. They integrated them into a tightly coupled business model.

choosing between incremental or revolutionary approaches is not the right framework

Setting coordinates for Dragon Eye, Enduring Freedom.



U.S. Marine Corps (Kenneth E. Madden)

standing joint task forces, and integrating organizations are all mechanisms for horizontal coordination. They are more commonly used today than ten years ago because the new way of war, as shown in Afghanistan and Iraq, requires more integration. And computer tools are mechanisms of integration. GroupWare, collaboration technologies, and other systems help solve problems in coordinating different units. They are also a response to growing complexity and tighter coupling of activities.

The trouble is that these integration mechanisms and computer tools are not seen as part of a larger theory for factoring complex problems where strong interdependencies exist. Acquisition specialists, for example, see the benefits and limitations of integrated product/process teams. But it rarely occurs to them that there are other coordination mechanisms. Liaison offices, fusion centers, joint task forces, and specialized coordinating organizations such as the Joint Staff offer different approaches to integration.

There are many ways to put it all together. Which is best depends on considerations such as the degree of complexity, the amount of subunit interdependence, the degree of information to be shared, and the cost. There is no single best way. It depends on the problem and the budget.

Personnel must be trained on the new approaches to systems integration. Looking at the attributes of these approaches—information volume, cost, and dependence on information technology—allows leaders to choose. Rather than debating incremental or revolutionary alternatives, attention would be far better committed to choosing among integration alternatives matched to the tasks of a networked force.

Outsourcing Information Technology

Complex organizations require complex supply chains. Outsourcing is too important in the new way of war to be left to contractors. But when complexity makes a field opaque, leaders have difficulty allocating resources in a rational way that improves the performance of the whole organization.

Information technology (IT) contractors, for example, are critical for networked operations because they operate and even own many of the networks that are the backbone of the new way of war. But IT outsourcing is unlike contracting for catering or janitorial services. Rather, it is a highly fragmented industry that causes bewilderment. Yet managing it is as important as managing an ammunition supply system. The natural tendency is to deal with complexity by outsourcing it. While that gets rid of the problem, outsourced



55th Signal Company (Michelle Labrielle)

M93A1 FOX, nuclear biological chemical reconnaissance system, Enduring Freedom.

networks are part of the total defense system. Leaders need to direct a networked organization the same way the Pentagon directs the building of the joint strike fighter or a new radar.

Outsourcing often leads to a confusing mixture of systems, personnel, and sites. Some IT staff members are civilian employees, some are military personnel, and some are private contractors. Responsibility is spread across so many individuals and organizations that getting a handle on it is hard. This degree of opaqueness would not be tolerated on the battlefield. Yet information technology is an important contributor to what happens on the battlefield.

What is needed is for government organizations to develop an IT outsourcing review that clearly maps this part of the defense value chain to overall performance.

outsourcing often leads to a confusing mixture of systems, personnel, and sites

That would catalog exactly which activities are critical, what firms are doing the work, performance benchmarks, and the company innovation record. Some of the most important outsourced IT networks need to be analyzed as much as the organization of joint forces. This could be an opportunity for major innovations.

Software

At the heart of network centric warfare is software, the glue that links the forces. Yet its importance is often overlooked because the Department of Defense, the services, and the intelligence community are platform focused. They have a history of concentrating on airplanes, ships, and satellites. They do not yet understand the significance of network operators, whose efforts could be deciding factors in future mission success.

Software needs to be put on as solid a foundation as platforms. As a discipline, software is only fifty years old, half the age of the aircraft industry and a small fraction of shipbuilding. It has very different traditions than the platform industries.

For example, when an airplane crashes there is a well-developed approach to determine the cause. Teams of engineers and safety experts investigate what went wrong and why. Their findings are reported to manufacturers and to Air Force and Navy organizations that exist for the purpose of making sure the lessons are factored into maintenance and training.

In the future, software crashes could be more deadly than airplane crashes. Such failure could cause more loss of life if, for example, a reconnaissance network crashed during a battle. Yet there is no comparable mechanism with the sophistication or experience as those the Air Force or Navy have for understanding airplane crashes. Indeed, software does not even have a tradition of post mortem analysis of analyzing past failures. After an intelligence setback, it is routine for the intelligence community to search for ways to improve the process. But in a world where networked operations are key, no such cultural approach is being created for one of the key ingredients that run networks—software.

A related issue is productivity and network manning levels. For example, as part of the effort to develop efficient platform manning requirements, the Navy DDX program will have about one half of the crew size of earlier ships. Similar programs exist in other services. Yet there is little attention to efficiently manning computer networks. Network operations centers have become so complicated that they add enormous staffs. Moreover, the desktop of a network professional is often a confusing hodgepodge of icons and yellow Post-it notes. If any battle is fought with such a system, senior commanders will immediately see the potential for disaster. Yet combat is likely to use such systems because computer networks are becoming so integral to joint warfighting.

Streamlining networks, making them as efficient as fighting forces, offers a great systems integration opportunity that will pay off because it affects so many areas of the new way of war. Systems integration is a powerful framework for considering alternative transformation strategies. It highlights critical areas such as better integration tools, information technology outsourcing, and software that need more sober analysis to meet the challenges of military transformation. **JFQ**



U.S. Marine Corps (Brian L. Wickliffe)

Trends in Future Warfare

By CHRISTOPHER J. BOWIE, ROBERT P. HAFFA, JR., and
ROBERT E. MULLINS

The United States has engaged in several conflicts since the Cold War. It built a coalition to drive Iraq out of Kuwait, conducted an air campaign against Serbia with its NATO allies to halt ethnic cleansing in Kosovo, and defeated the Taliban in Afghanistan as part of the global war on terrorism. And it has launched an invasion of Iraq to overthrow Saddam Hussein. While these interventions have failed to bring peace to the world,

the Armed Forces are likely to remain militarily committed for many years.

Recent conflicts offer insights on the conduct of war in the early 21st century. These trends are drawn from high-intensity combat operations over a relatively modest timeframe. Trends over the last decade will probably endure for another ten years and underscore the relevance of strategic realities, military capabilities, and enabling technologies for the future.

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Some Basic Assumptions

War will continue to be an instrument of national power. The fact that there have been four major conflicts since the Cold War may be evidence enough that the near-term future is unlikely to be peaceful. Trends revealed in these

conflicts will not be rapidly overtaken by revolutionary new technologies. Those analysts who have studied the revolution in military affairs in an historical context argue that technical breakthroughs are not sufficient in themselves to bring about an entirely different way of warfighting. Corresponding organizational and doctrinal changes require twenty or thirty years to take root, mature, and evolve into new capabilities.

Trends in warfare can be plotted across a range of conflicts. The diversity of the conflicts

the distinction between command and control and execution is increasingly blurred, mainly because of real-time operational pictures

argues in favor of capabilities for both high-intensity and small-scale contingencies. Asymmetry is a commodity that will be coveted by the United States and its enemies. A conventional imbalance will induce potential enemies to wage

asymmetric warfare. The Armed Forces must be prepared to confront such threats. The task is examining trends that describe enemy actions in recent conflicts and point to areas in which Washington can increase its competitive advantages.

An analysis of future warfare cannot review all aspects of military strategy and operations. For example, increased reliance of land, sea, and air operations on space-based assets is difficult to weigh. Moreover, areas such as information operations, air and missile defense, and post-conflict operations do not readily lend themselves to trend analysis but are also clearly worthy of serious evaluation.

Hindsight is not always accepted as useful in developing recommendations on the conduct of future war. After all, there is the old adage that the military often prepares to fight the last war. A corollary may be that little can be learned from past conflicts because of their uniqueness. While recent conflicts have been unique, evidence suggests that the historical record is relevant.

Political-Military Trends

The location of recent conflicts suggests a shift from Europe toward Asia, a region of vast economic importance and diverse security challenges. Whatever a future war in that region might look like, it will not resemble an intense battle in Europe from large fixed bases dispersed over relatively short distances envisioned over the last half century.

America depended on alliances such as NATO for collective defense during the Cold War. In three post-Cold War conflicts, coalitions

were organized as the result of an ad hoc approach to securing international support for military operations led by United States. Rather than the long-term arrangements that typified past alliances, future coalitions are likely to be temporary liaisons, with some partners proving more faithful than others.

In contrast to the Cold War, recent allied contributions have largely come in the form of political support and access to facilities rather than combat forces. Trends in coalition warfare have revealed widening disparities in capabilities that will cause allies in the future to fall farther behind, although niche capabilities such as special operations forces will remain valuable.

Evidence underscores the potential for military showstoppers arising from political issues, the tyranny of distance, and constraints on infrastructure. Efforts to obtain political access can be complicated, especially for conducting offensive operations. Moreover, Asia has a much lower base density and less developed infrastructure than Europe and the Middle East. Although anti-access threats were limited in recent conflicts, power projection will be confounded by improved enemy capabilities.

Enemies have sought to evoke global criticism and weaken coalition resolve by exploiting American sensitivity about casualties and international aversion to collateral damage. Failing that, enemies have sought to reduce the vulnerability to coalition action through air defense, camouflage, concealment, deception, dispersal, mobility, and hardened facilities. Weapons of mass destruction have cast a long shadow in recent years, and proliferation may be the response to the conventional military dominance of the United States. The consistency of these trends suggests that similar challenges may arise in the future.

New Ways of War

Two consequences of increased situational awareness and their implications for time-critical strike operations in the future warrant attention. First, the rapidly improving speed at which targets can be generated and attacked by a combination of battle management, sensor, and strike platforms has compressed what is known as the kill chain. For example, while the targeting process took weeks in operations against Iraq in 1991, it was reduced to 45 minutes or less by 2003. Second, the distinction between command and control and execution is increasingly blurred, mainly because of real-time operational pictures of the battlefield as well as the role of civilian and military leaders in issuing targeting guidance. The latter trend resulted in a creeping centralization of command and execution as the rear echelon reaches forward to the battlefield in near-real



U.S. Navy (Rob Gaston)

Combat direction center aboard USS Enterprise.

time. Because of the enhanced political content of conflict in a world of instantaneous information, centralized execution will often accompany centralized control.

The deliberate planning process is a legacy of the Cold War that sustains a predilection for scripted as opposed to dynamic military operations. However, in the nonlinear and fluid operating environments that will characterize future battlefields, renewed emphasis on adaptive planning and dynamic operations is necessary. Experiences in Desert Storm, Allied Force, Enduring Freedom, and Iraqi Freedom underscore this trend. For example, 20 percent of targets were selected after aircraft launch during the Gulf War, whereas 43 percent were selected once planes were airborne over Kosovo. In Afghanistan 80 percent of carrier-based sorties were launched without designated targets. The statistics for Iraqi Freedom are likely to be consistent with this trend.

Throughout the conflicts, combat losses were statistically insignificant despite the enemy objective of causing heavy casualties to hasten termination. The reasons lie in a combination of new operational capabilities, highly survivable combat platforms, and guidance systems to limit the vulnerability of U.S. forces.

Long-range operations are an outgrowth of the access problem and migration of conflict to distant and remote regions. During the Cold War, planners developed concepts of operations based on the premise that forward operating bases would be available to both launch and sustain combat. From the Gulf War to Afghanistan and Iraq, the trends suggest that this assumption is increasingly risky. As a hedge, provision must be made to project firepower over long distances. For example, problems regarding access to forward bases in 2001 and 2003 resulted in emphasis on carrier-based aircraft, long-range bombers, and aerial refueling.

While rapidly deployable, highly maneuverable ground forces that can leverage the effects of modern precision weaponry are integral to dynamic military operations against elusive enemies, there is a mismatch between slow-moving and late-deploying heavy land forces and the demands of the future operating environment. In addition, the ways of delivering firepower have changed. As the Secretary of Defense observed: "Looking at what was overwhelming force a decade or two decades ago, today you can have overwhelming force, conceivably, with lesser numbers because the lethality is equal to or greater than before." The ground force employed



U.S. Air Force (Stacy L. Pearsall)

Searching Abu Ghurayb market.

in Iraqi Freedom was lighter than and half the size of that in Desert Storm, but it had a more ambitious mission.

Technological Advantages

Precision-guided munitions have emerged as the centerpiece of a new revolutionary style of air warfare. One trend since the Persian Gulf War has been the steadily increasing place of these weapons in the percentage of munitions delivered:

8 percent in Desert Storm, 30 percent in Allied Force, 60 percent in Enduring Freedom, and 70 percent in Iraqi Freedom. Other trends are the growing number of precision-guided munitions delivered per sortie and the increasing percentage that can be delivered in adverse weather, ranging from 13 percent in the Gulf War to 90 percent in Afghanistan and Iraq. Finally, the trend points to new capabilities derived from increased payload fractionation (delivering larger amounts of smaller unguided weapons) and mass precision (rapidly releasing large numbers of weapons).

In Iraqi Freedom, a smaller organization delivered twice as many munitions per day as the air component in Desert Storm.

Another advantage stems from the quantity and quality of sensors and their integration into systems and networks. The trend toward network-centric operations is advanced by a promise of information dominance and situational awareness.

less expensive, more capable, and lighter sensors will support networking intelligence-quality sensors on the battlefield

Underpinning this promise are technologies to create network-centric architectures consisting of high-quality sensors and rapidly transmitted data that will be fused and integrated at command and control centers. Conflicts since the Gulf War witnessed growing integration of command, control, intelligence, surveillance, and reconnaissance assets. In the future, less expensive, more capable, and lighter sensors will support networking intelligence-quality sensors on the battlefield. Assuming that data streams from myriad sources can be rapidly integrated, commanders will enjoy greater situational awareness.

From the Persian Gulf to Kosovo, and to a lesser degree in Afghanistan but reinforced in Iraq, low-observable aircraft were used with revolutionary impact. Low-observable technologies applied to combat aircraft have allowed them to operate with relative impunity against sophisticated air defenses. The ability of stealth aircraft to operate independently has reduced the requirement for considerable resources to escort attack aircraft. Electronic warfare assets were used in support of stealth aircraft but were more critical in enabling non-stealth aircraft—the mainstay of the current force—to survive in nonpermissive environments. Emphasis on airpower-centric campaign plans will demand renewed investment in stealth and electronic countermeasures.

Unmanned aerial vehicles have demonstrated their increasing operational utility in the post-Cold War era, particularly when enabled by advances in satellite guidance and communications, computerized flight control systems, and sensor technology. Indeed, unmanned systems assumed new roles because of improvements in range, endurance, on-board sensors, and data transmission. Though only one vehicle, the Pioneer, was deployed in the Persian Gulf War, ten types were used in Iraq in 2003 to provide situational awareness in a cluttered battlespace. And while they were used principally in earlier conflicts for intelligence, surveillance, and reconnaissance, they had evolved into sophisticated, air-breathing, hunter-killer platforms by 2001.

The Future

The new way of warfare exhibited over the last decade is not compatible with the clash of interstate armies that prevailed during the Cold War. Indeed, as opposed to the Eurocentric vision of warfare encompassing large armies and vital interests, the strategic center of gravity has moved to uncertain threats emanating from Asia. This trend has been accompanied by a change in the way allies are selected: a trend in favor of temporary coalitions and ad hoc partners who are valued for their political and diplomatic support rather than direct military participation.

F-16 over Afghanistan,
Enduring Freedom.



U.S. Air Force (Suzanne M. Jenkins)

Meanwhile, enemies of the future could include rogue states, nonstate actors, and possibly a peer competitor, all poised to undermine the use of force by the United States, with the objective of exploiting sensitivities to casualties, international public opinion, and battlefield vulnerabilities. In addition, enemies can be expected to exploit the multifold dimensions of the access challenge by confounding U.S. capabilities to project and sustain military power in the region of conflict. Most ominously, events in Iraq suggest that enemies may possess and use weapons of mass destruction, the mere possibility of which will deter some courses of action, limit basing options in theater, compel the focus on counterforce missions by targeting weapons of mass destruction, and frustrate campaign-level force employment options.

Militarily, there has been a dramatic trend away from scripted plans and operational orders to a fluid, nonlinear, and adaptive battlespace in which targets are generated while attack platforms are en route. Factors that account for this approach to target generation begin with requirements for extended reach in recent operations. Added to the tyranny of distance is the elusive nature of enemy forces and sketchy target sets characterized by fleeting opportunities, which are masked by deception. These factors are offset by an order of magnitude improvement in situational awareness that enables commanders on all levels to view the battlespace and intervene in near-real time.

Battle management indicates that the trend toward centralized execution is a growing reality. Finally, the most prominent tendencies in force deployment and employment include an increased role for naval and air forces to project power quickly from a distance, a diminished emphasis on slow-moving, heavy ground forces requiring a large footprint in favor of agile fixing forces, and continued means and measures to lower the risk of American casualties.

With regard to technology, the trend has been dominated by the use of precision munitions. They not only hit their targets, lowering the level of effort and minimizing collateral damage, but also reduce capabilities that must be deployed. But such weapons are not useful without precise information. They are linked to improved targeting guidance aided by high-quality sensors, stealth and electronic jamming, and unmanned vehicles for intelligence, surveillance, and reconnaissance as well as hunter-killer roles.

The United States has fielded impressive capabilities to meet the challenges of the post-Cold War era, including the global war on terrorism. However, the road ahead appears ever more demanding in terms of both the diversity of the threats and enemy capabilities. Such considerations suggest that the United States must prepare for uncertainty by investing in concepts, capabilities, and technologies to sustain competitive advantages. What will ultimately be required are agile, access-insensitive forces that project power across great distances with little reliance on externals.

JFQ

Commonwealth troops entering Iraqi refinery.



Imperial War Museum

The Other Gulf War

British Intervention in Iraq, 1941

By DOUGLAS PORCH

Iraqi Freedom offers not only a reprise of unfinished business from the Persian Gulf War, it is the third invasion of Iraq by Great Britain since independence in 1932. During World War II, Winston Churchill ordered his commander in chief, Middle East, General Sir Archibald Wavell, to march on Baghdad. The reason for intervention was strikingly similar to that advanced more than fifty years later: to preempt Axis support for Rashid Ali el Gailani, a violently

anti-British Arab nationalist, who threatened British interests. The occupation would also strike a blow at terrorism orchestrated by a charismatic Islamic cleric. Finally, intervention would protect oil reserves vital to the war effort.

Churchill forced the offensive on Wavell, who favored a diplomatic approach. The general argued against an invasion in terms that mirrored recent objections—he lacked the resources to add Iraq to a long list of military commitments. He believed intervention would make the region less secure because Iraqi antagonism was linked to Palestine. Wavell urged accepting a Turkish offer to mediate so London could take care of pressing affairs elsewhere.

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The Origins

The British accorded sovereignty to Iraq in 1932, making it the first former Turkish colony in the Middle East to gain independence. However, because Basra and Baghdad were important as an air link and land passage between India and British-controlled Palestine and the Suez canal, a treaty that permitted Commonwealth troops to transit Iraq also required Baghdad to “give all aid, including the use of railways, rivers, ports, and airfields” in the event of war. Iraq undertook to provide security, especially protecting the pipelines that ran from the Mosel and Kirkuk oilfields in northern Iraq to Haifa on the Mediterranean. By 1937, the British presence had been reduced to two Royal Air Force (RAF) bases, one at Shaibah, close to Basra, and the other at Habaniya, on the Euphrates near Baghdad.

Yet anti-British sentiment persisted, especially in the army, whose officers resented foreign influence, took offense at the refusal to provide arms, and opposed Jewish emigration to Palestine. But little could be done because the Hashimite monarchy was imported from Saudi Arabia in the wake of World War I and did not have deep roots in the country. It was weakened by association with the British and utterly dependent on the army to keep order, especially after both the Assyrian rebellion in 1933 and the

tribal rebellions of 1935–36 were crushed. In this tumult, Iraqi officers organized a secret society known as the Golden Square and kept an eye on the throne to monitor

the slightest pro-British tilt. Distrust of Great Britain led many Iraqis to attribute the automobile accident that took the life of King Faisal in 1939 to British agents. His demise cleared the way for the Golden Square to act as the principal power broker in the country.

Iraq was obligated by treaty to side with Britain when World War II broke out. But the government of the four-year-old king, under direction of an uncle who served as regent, proved too feeble to surmount the opposition of the prime minister. A lawyer and cofounder of the Muslim Brotherhood, whose cells were active across the Middle East, Rashid Ali el Gailani was a passionate supporter of the Arab cause in the face of Zionist penetration of Palestine. Early Axis triumphs and the arrival of an Italian armistice commission to monitor the Vichy military in Syria emboldened Rashid Ali. British insistence that Iraq break diplomatic relations with Italy brought the situation to the brink in early 1941.

When the war cabinet recommended sending a division from India to occupy Basra, Wavell objected that British troops would only enflame nationalism. His decision left RAF bases in Iraq vulnerable, guarded only by a locally recruited constabulary with armored cars.

After the fall of France, the Italian declaration of war, and the RAF victory in the Battle of Britain, the focus of the war shifted to the eastern Mediterranean. Iraq was merely one piece in a complex geopolitical jigsaw puzzle that ran from Cairo to Tehran. And while Britain had strengths, most notably the Royal Navy based in Alexandria, its principal vulnerability was the volatility of a region ripe for Axis exploitation.

Religion and Politics

Of particular concern was the intrigue by Amin al-Husseini, the grand mufti of Jerusalem, who sought refuge in Baghdad after being exiled in 1937. His delicate features and gentle manner accentuated by deep blue eyes, trim goatee, and calm voice, concealed a zealous and violent nature. A former Ottoman artillery officer turned teacher, al-Husseini was sentenced to ten years in prison by the British for his part in anti-Jewish riots in 1920 in Jerusalem. In a gesture of misplaced leniency, he was pardoned and stood for grand mufti in the following year, an office that normally went to jurists who arbitrated disputes by interpreting Koranic law.

The British calculated that there was nothing to lose in allowing al-Husseini to play the role since he had no adherents in the Arab community. This proved to be a mistake. As grand mufti, he was poised to exploit Arab-Jewish tension that began with the exodus of Jews to Palestine in the 1930s. His anti-British and anti-Semitic rhetoric found an audience in a growing middle class, which, ironically, had prospered as the result of Jewish economic activities. As president of the Supreme Muslim Council, he controlled religious schools and courts as well as trust funds that spread his message in Iraq and Syria. He also launched attacks on Jewish settlements and assassinated moderate Arabs who urged compromise but were marginalized by terrorism and Islamic fundamentalism.

Moreover, the mufti benefitted from a decline in British fortunes. After 1938, Germany, Italy, and even Spain fueled Arab nationalism with radio broadcasts, cultural subsidies, and anti-Semitic literature that was translated and distributed through schools by al-Husseini. Palestinians imitated fascist organizations and praised Nazi racial laws, dreaming of a day when Germany and Italy would eject the British and the Jews from the Middle East. The evenhandedness of Great Britain found few takers in the region. Palestine was rife

Iraq was obligated by treaty to side with Britain when World War II broke out

Middle East Theater—World War II



with rebellion with the outbreak of war in 1940. Some 20,000 British soldiers maintained order between Muslim extremists and Jewish militants, who conducted raids as far away as Syria and Lebanon. In late 1940, the British discovered that the Iraqi army was training a unit of Palestinians and Iraqis to fight for the mufti. The ambassador to Baghdad reported that, so long as London refused to adopt a more pro-Arab policy in Palestine, “in Iraq, we get the disadvantages.”¹

Arab nationalist feeling within the army, intrigue on the part of the grand mufti, and anti-British posturing by Rashid Ali combined to bring Iraq to the brink of civil war. On the night of March 31, 1941, tipped off that officers planned to move against him, the regent escaped across the Tigris in a motorboat and made his way to the RAF base at Habbaniya, from which he was flown to Basra and asylum on board *HMS Cockchafer*. On April 3, Rashid Ali el Gailani seized power with the help of army and air force officers of the Golden Square and proclaimed a national defense government. He warned the British ambassador against intervention in internal affairs and dispatched a force to Basra to block British troops from landing.

The coup in Baghdad threatened British interests by severing the air link and land route between India and Egypt, endangering supplies from the northern oilfields on which defense of the Mediterranean depended, and allowing a nationalist success in Iraq to subvert the tenuous position of Great Britain in Egypt and Palestine. Against this threat, Wavell argued that his hands were full in spring 1941. He evacuated three divisions and an armored brigade from Greece and prepared to defend Crete against German assault. An offensive against Italian forces in East Africa was about to start. Moreover, a little-known enemy general, Erwin Rommel, had launched a surprise offensive into Cyrenaica in March with a reinforced German and four Italian divisions, driven to the Egyptian frontier, and invested 36,000 British troops at Tobruk. To Wavell, even with enough forces on hand, this was hardly the moment to ignite Arab volatility.

Intervention

Wavell contended that he had more important fires to put out, which brought his relationship with Churchill to the boil. On the surface, the prime minister and the general should have gotten along famously. Both were aristocrats and

Interviewing Persian officer.



Imperial War Museum

veterans of the Boer War and World War I as well as authors and historians with prodigious memories. Both realized they were fighting a conflict that required difficult strategic choices. And both had a proclivity for unorthodox solutions tempered by common sense. But that was the end of their similarities.

Churchill was a man of strategic imagination who demanded enthusiasm that bordered on zealotry from subordinates. Wavell was a meticulous planner with a talent for administrative detail. He was much more attuned to the complexities of an operation than to its visionary possibilities. Although regarded as a premier army trainer, Wavell was too cerebral and taciturn for Churchill. Conversely, the prime minister constantly meddled in campaign planning and initiated courses of action from 3,000 miles away, often in excruciating detail. Wavell responded by shielding information from London. This lack of transparency markedly increased the distrust that Churchill harbored for his commander in chief, Middle East.

By early 1941, Churchill was beyond temporizing. “War,” he said, “is a contest of wills.”² He had chosen to make a major commitment to the eastern Mediterranean—against the advice of his chiefs—because there Britain could take the offensive and showcase its value as an ally of the United States. By vigorous action, he would distance himself from the appeasement policies of Neville Chamberlain. An invasion of Iraq would

forestall Axis intervention and force Baghdad to break with Italy, eliminate Rashid Ali and al-Husseini, reinforce British rights of transit, and bring Turkey into the war with Mosul as the prize.

On orders of the chiefs of staff, Delhi landed a brigade at Basra on April 30, the vanguard of 10th Indian Division, which was en route to Iraq. Rashid Ali, who preferred to avoid confrontation until he could solidify support, decided that time was not on his side. As a result, he assembled a brigade armed with artillery to eliminate the air base at Habbaniya before it could be reinforced. In London, the April 30 news that a large Iraqi force had invested Habbaniya caused the chiefs to exult that their intervention in Basra had caused Rashid Ali’s plot to go off at half-cock before the Axis could organize support for the regime. But in the short term, it was unclear who had preempted whom. Habbaniya was an airfield that housed a training school of 1,000 airmen together with 9,000 civilians, many British dependents. It was defended by a seven-mile iron fence and constabulary of 1,200 Iraqi and Assyrian levies backed by armored cars under a British lieutenant colonel. Even an attacker with a poor grasp of tactics had to realize that eliminating the water tower or power station at Habbaniya would compromise any resistance.

The best defense of Habbaniya lay in airpower. But the task was left to half-trained student pilots flying a fleet of 78 mostly obsolete biplanes, some hastily rigged to carry bomb loads as small as 20 pounds, hardly more than air-launched grenades. The arrival of eight Wellington medium bombers from Egypt capable of delivering 4,500-pound bomb loads, a few Gladiator biplanes and Hurricane fighters, the warhorse of the Battle of Britain, and 300 soldiers airlifted from the RAF base at Shaibah afforded some protection against two battalions that invested the base on April 30. A buildup of Iraqi forces outside the base to brigade size led the commander at Habbaniya, Air Vice-Marshal H.G. Smart, to conclude that attack was the best form of defense.

At 0500 hours on May 2, the bombers and fighters struck Iraqi forces, who answered with an artillery barrage on Habbaniya. The Iraqi air force, based outside Baghdad at Rashid, rendered a good account of itself, especially against student pilots in trainers. Smart directed subsequent attacks on Rashid and lines of communication. Fast twin-engine Blenheim medium bombers with 1,000-pound bombs, escorted by long-range Hurricanes, arrived from Egypt to pound airfields in Baghdad and Mosel, where a small *Luftwaffe* detachment was based. After four days of bombing and raids by the King’s Own Royal Regiment, the Iraqis

the Iraqi air force rendered a good account of itself, especially against student pilots in trainers



Imperial War Museum

Floating bridge near Basra.

withdrew, leaving burning trucks and exploding ammunition along the road to Baghdad courtesy of the Royal Air Force.

Axis Intrigue

The defence committee in London, armed with Ultra intercepts detailing pleas from Iraq for Axis support, and worried by broadcasts by the mufti calling for *jihād* against “the greatest foe of Islam,” obliged a reluctant Wavell to invade before the enemy organized support for Rashid Ali. For his part, Wavell argued in favor of accepting a Turkish offer to mediate the crisis on the basis of a cessation of hostilities against a promise by Rashid Ali that Axis forces would not be allowed into Iraq. Churchill rejected this option but left open the possibility of ceding Mosul to Turkey as encouragement to enter the war. Axis propaganda extolling Rashid Ali gave the impression that London had coordinated his coup with Berlin and Rome.

The prime minister had no intention of allowing the new regime to pull in Axis reinforcements or encourage imitators among nationalist officers and supporters of the grand mufti in Egypt. But Wavell argued without avail against stripping Palestine and the Trans-Jordan of its

overtaxed garrison to invade Iraq. He reluctantly assembled 5,800 men (known as Habforce) in Palestine under Major General J.G.W. Clark for the march on Baghdad. Churchill became so annoyed at the dispatches from Wavell and the lack of preparation by 1st Cavalry Division in Palestine, much of it on horseback and without anti-aircraft guns, that he came close to sacking him.

The preventative invasion of Iraq caught Germany off guard, mainly because its diplomats and military were divided over the question of exploiting Arab nationalism. The foreign office in Berlin had been in contact with the mufti. But Hitler preferred to leave policy formulation on the Mediterranean and Middle East to Rome. The *Wehrmacht* high command, whose views on Italian competence are unprintable, supported Arab nationalist movements to undermine Britain. Nevertheless, the Iraqi rebellion surprised the Germans, who were engaged in ending campaigns in the Balkans and Greece, mounting an assault on Crete, and planning Barbarossa, the invasion of Russia scheduled for June 1941. Admiral Jean Darlan, reeling from the Royal Navy attack on the French fleet at Mers-el-Kébir near Oran in July 1940, offered to release Vichy war stocks in Syria, including aircraft, permit passage of German war matériel across Syria, and provide an air link for German support to Rashid Ali from Axis-occupied Rhodes.

By the time Hitler declared that the Arab liberation movement was a natural ally, Churchill had preempted Axis intervention. Nor did Iraq further its cause by mistakenly shooting down the plane with Major Axel von Bloomberg, a German negotiator sent to coordinate military support. Despite efforts by Rudolf Rahn, the German representative on the Italian armistice commission in Syria, to run trains of arms, munitions, and spare parts to Iraq through Turkey and Syria, and the intervention of Axis planes, the five Iraqi divisions and 60 serviceable aircraft were no match for a force of 200 aircraft. Habforce, spearheaded by the Arab Legion, reached Habbaniya on May 18 after crossing 500 miles of searing desert in a week. By this time, RAF bombers had annihilated the Iraqi air force and extended attacks to Syrian bases that serviced Axis planes. Many members of the Iraqi regime applied for Syrian visas.

Occupation

The British occupied Basra in mid-May 1941, asserted their rights under the 1930 treaty, lifted the siege of Habbaniya, and temporarily averted Axis intervention. But their next move was intensely debated. In London the chiefs of



Guarding oil facilities,
Abadan.

Imperial War Museum

staff argued for continued pounding of the Iraqis to “defeat and discredit the leaders in the hope that Rashid’s government would be replaced.”³ For his part, the commander in chief, India, made a case for marching to Baghdad followed by the military occupation of northern Iraq, which offered the only long-term guarantee against Axis intervention. Churchill compromised, ordering Clark to march Habforce to Baghdad but at the same time assuring Wavell that he would not have to commit scarce forces to a long-term occupation of northern Iraq until Rommel was defeated.

The Iraqi army, fighting from behind defense lines along canals and fields flooded by water from tributaries of the Euphrates, put up a respectable resistance against Habforce, which divided into columns and advanced from three directions. On May 30, Habforce scattered the Iraqi

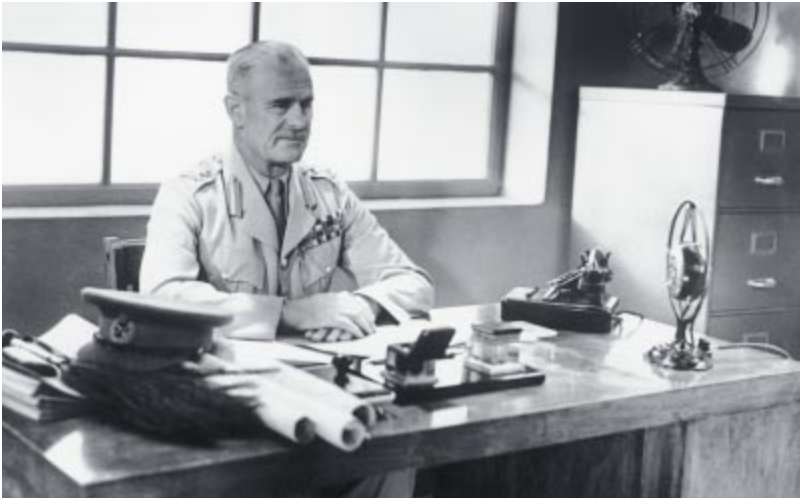
units supported by Italian aircraft on the outskirts of the capital. To avoid urban warfare, Clark bluffed; an interpreter called the headquarters of Rashid Ali with exaggerated claims of British strength. The Iraqi leader, who was demoralized by the lack of Axis support, fled to Persia with the rump of the Golden Square and the grand mufti in tow. The British signed a lenient armistice that allowed the Iraqi army to retain its weapons and return to their barracks. Wavell left the administration of Baghdad to Iraqis. The pro-British regent regained the throne on June 1, but order disintegrated as Jewish merchants became targets of outraged nationalists and free-lance looters. The British army, camped outside the city, did not intervene.

Regime change in Iraq created dominoes. Unsettled by the Vichy invitation for Germany to use Syrian air bases and goaded by the Free French under Charles de Gaulle, Churchill ordered the invasion of Syria and Lebanon, which fell in mid-July after a six-week campaign. In August, British and Soviet forces invaded Persia, overthrowing Reza Shah and replacing him with his son, Mohammad Reza Pahlavi. Axis attempts to stoke Arab nationalism and Islamic fundamentalism to undermine the British base in the Middle East and eastern Mediterranean had been quashed.

Fast Forward

The American campaigns against Saddam Hussein and Osama bin Laden offer a reprise of the crusade by Churchill against Rashid Ali and the grand mufti in 1941. The three arguments the President advanced in 2002 for regime change in Iraq—preempting Saddam Hussein before he acquired weapons of mass destruction and the means to deliver them, the link between Iraq and terrorism, and the danger that a region containing 20 percent of world oil supplies could fall under the control of a regime that might employ the resources for malevolent purposes—mirror the points Churchill made in a different yet similar context over sixty years ago.

In 1941, Iraqi resistance against even a hastily organized, underarmed, outnumbered, and poorly supplied force proved illusory, much as Iraqi resistance collapsed in the Persian Gulf War. Nevertheless, the debate in London on how far to go proved remarkably similar to 1991. Unlike President George H.W. Bush, however, Churchill opted for regime change over the advice of his commander, who was content with discrediting the leadership in the hope that Iraqis would take matters into their own hands. Despite inflammatory nationalist rhetoric, support for the regime of Rashid Ali proved as shallow among Iraqis as nostalgia for Saddam today.



Archibald Wavell.

Imperial War Museum

Lessons of History

A more important question is what Britain gained from preventative war. The short answer is that London solidified its position in the Middle East by preempting Axis intervention and also bought time to bring a major ally on line, reversed the tide of war in the Mediterranean theater that in spring 1941 strongly favored the Axis, and emerged among the victors of World War II. But even before the war ended, British power in the Middle East had begun to wane, beginning in Palestine. Iraq, Iran, and Egypt were in turmoil by the 1950s.

The prevailing verdict on British interaction with Arab countries during World War II is that by invading Iraq and Persia, exiling the mufti,

the prevailing verdict is that London fueled the flames of Arab nationalism and Islamic fundamentalism

sponsoring Zionist counter-terror groups, and using heavy-handed tactics in Egypt, London fueled the flames of Arab nationalism and Islamic fundamentalism. Those actions ultimately compromised long-term regional interests. Stability in the Middle East, the British ambassador to Baghdad argued in 1941, hinged on Palestine. No amount of intervention to produce regime change elsewhere would resolve that problem. At least one writer argues that Wavell was correct, that Turkish mediation and the threat of British force could have produced a compromise that would have preserved British forces for more pressing operations and limited Arab resentment against colonialist policies.⁴

Although few lifted a finger to defend Rashid Ali and the Golden Square, the years from 1941 to 1945 became known to Iraqis as the second occupation, a time of reconstruction characterized by heavy British troop presence, deep purges in

the army and administration, and electoral fraud to ensure that only supporters of the regent served in parliament. Stable government under the British brought a welcome alternative to the turmoil of the 1930s, but the long-term benefits were less certain. The regime reinforced its ties with tribal chiefs and favored landowners. Peasants fled to the burgeoning slums of Baghdad. Sunni politicians allowed Shias and Kurds only cosmetic participation in the political process. The democratic impulse in Iraq was stillborn, while the monarchy labored with little success to build a popular following. The army, courted as a symbol of national unity by the monarchy and considered a requirement for internal order by the British, retained its grip on areas traditionally difficult to govern. This proved a costly solution. A growing *effendi* class of educated mid-level professionals and army officers attracted to pan-Arab ideas and agitated by the continued conflict in Palestine articulated their discontent. The army removed the monarchy in 1958, and Iraq entered a period of murderous instability from which Saddam Hussein emerged in 1979 to seize power.

The challenge is translating victory over Saddam Hussein into a program that will stabilize a region inclined toward effervescence and avoid the need for a repeat intervention. The British experience reveals that regime change alone is no panacea. While it will eliminate the immediate problem, it will not lead to lasting change unless Iraq is placed on a more democratic footing, and the festering sore in the region—the Israel-Palestine dispute—is equitably resolved. **JFQ**

NOTES

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² Harold E. Raugh, Jr., *Wavell in the Middle East, 1939–1941* (London: Brassey's, 1993), p. 203.

³ I.S.O. Playfair, *The Mediterranean and the Middle East*, volume 2 (London: Her Majesty's Stationery Office, 1956), p. 186.

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General Wallace Martin Greene, Jr.

(1907–2003)

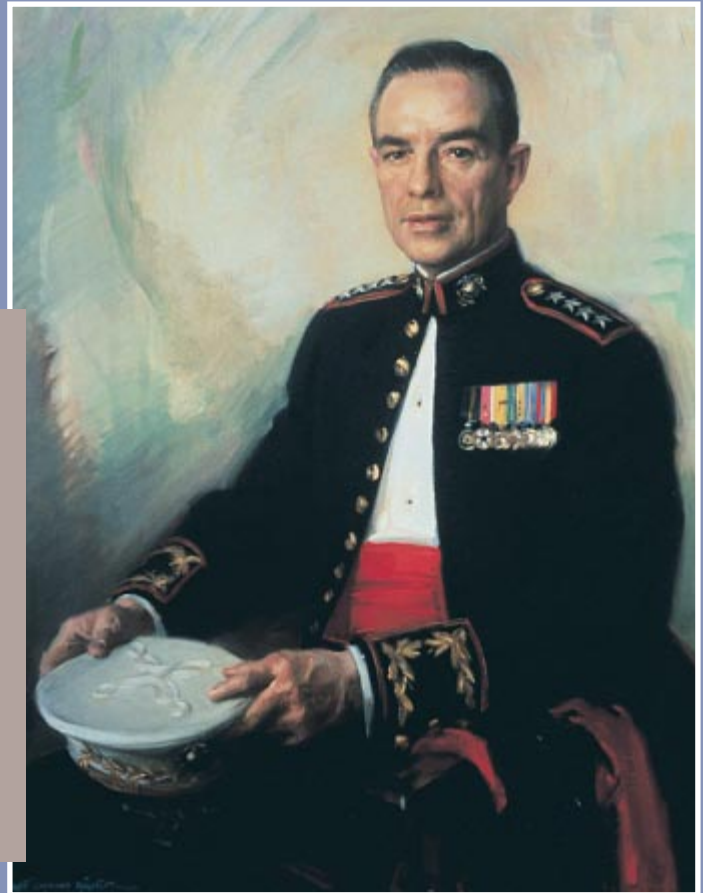
Commandant, U.S. Marine Corps

VITA

Born in Waterbury, Vermont; attended University of Vermont (1925–26); graduated from Naval Academy (1930); basic school, Philadelphia (1931); Marine barracks, Portsmouth (1931–32); sea school, San Diego (1932); *USS Tennessee* (1932–34); Pensacola, Quantico, and Lakehurst (1934–36); chemical warfare school, Edgewood Arsenal; Guam (1936–37); 4th Marines, Shanghai (1937–39); junior course, Quantico (1939–40); 1st Marine Brigade, Guantanamo (1940–41); 1st Marine Division, Quantico and New River (1941); naval observer, London; British amphibious warfare and demolition schools (1941–42); G–3, 3^d Marine Brigade, Western Samoa (1942–43); G–3, V Amphibious Corps, Hawaii and Marshall Islands (1943–44); G–3, 2^d Marine Division, Saipan and Tinian (1944); plans and policies division and personnel department, Headquarters, U.S. Marine Corps (1944–46); amphibious training command, Little Creek (1946–48); G–3, Fleet Marine Force, Pacific, at Pearl Harbor (1948–50); chief, combined arms section, Marine Corps Command and Staff College (1950–52); National War College (1952–53), special assistant to Joint Chiefs of Staff for NSC affairs (1953–55); assistant commander, 2^d Marine Division, Camp Lejeune (1955–56); commanding general, recruit training command and recruit depot, Parris Island, and Camp Lejeune (1956–59); assistant chief of staff (G–3), deputy chief of staff for plans, and chief of staff at Headquarters, U.S. Marine Corps (1959–64); 23^d Commandant of the Marine Corps (1964–67); died in Alexandria, Virginia.

The Commandant is *not* a statutory member of the Joint Chiefs. But when matters of direct concern to the Marine Corps are under consideration, then the Commandant meets with the Joint Chiefs and holds co-equal status with regard to such matters. . . . The Chiefs are advisors. They shape their advice for the good of the country—not on the basis of priority for what their respective services may want. And they are united as never before—more objective than ever before. . . . Each of us expresses any opposition he may have to a particular proposal, with full supporting detail, during JCS meetings. That's when it should be done, when we're shaping our recommendations, not *after* they've gone to the Secretary or the President. . . . When asked, and during our deliberations, each of us states his views as a member of the JCS and as a service chief. . . . But these are views and recommendations. They are *not* decisions. The decisions are made by the Commander in Chief.

—Wallace M. Greene, Jr., “How the Joint Chiefs of Staff View Their Dual Roles,” *Armed Forces Management* (December 1967)



U.S. Marine Corps Museum

Portrait by
Everett Raymond Kinstler

2004 CJCS Essay Competition

The 23^d annual Chairman of the Joint Chiefs of Staff Strategy Essay Competition was held on May 20–21, 2004, in Washington. This event was established by General David Jones, USAF, the 9th Chairman, to challenge students at the intermediate and senior colleges to write original essays on significant aspects of national security strategy.

FIRST PLACE ESSAYS

LIEUTENANT COLONEL HOWARD D. BELOTE, USAF

(National War College)

“The Political Role of Regional Combatant Commanders”

and

LIEUTENANT COLONEL GEORGE W. SMITH, JR., USMC

(Marine Corps War College)

**“Bridging the Gap of Cultural Intelligence
(Or, Have We Focused on the Wrong Transformation)”**

SECOND PLACE ESSAY

COMMANDER STEVEN W. KNOTT, USN

(U.S. Army War College)

“Institutional Intellectualism as an Agent for Military Transformation”

THIRD PLACE ESSAY

**LIEUTENANT COLONEL LING WEE LEE,
REPUBLIC OF SINGAPORE AIR FORCE**

(Air War College)

**“War Against Global Terrorism:
Winning the Hearts, Minds, and Souls of the Muslim World”**

BOMBING SERBIA INTO SUBMISSION

A Review Essay by

CONRAD C. CRANE

NATO's Air War for Kosovo: A Strategic and Operational Assessment

by Benjamin S. Lambeth

Santa Monica, California: RAND, 2001.

276 pp. \$20.00

[ISBN 0-8330-3050-7]

The Conflict Over Kosovo: Why Milosevic Decided to Settle When He Did

by Stephen T. Hosmer

Santa Monica, California: RAND, 2001.

155 pp. \$20.00

[ISBN: 0-8330-3003-5]

The conflict in Kosovo spawned numerous accounts of NATO airpower in Allied Force. Even though two RAND Project Air Force studies tout the success of bombing in persuading President Slobodan Milosevic to agree to a settlement, there are significant differences in their analyses. But their conclusions are provocative and troubling.

Benjamin Lambeth is a well regarded expert on Soviet airpower and recent air campaigns. *NATO's Air War for Kosovo: A Strategic and Operational Assessment* is an expanded version of a chapter in *The Transformation of American Airpower*, published in 2001. The author details the debate between General Wesley Clark, USA, Supreme Allied Commander Europe, and Lieutenant General Michael Short, USAF, the air component commander. The former favored concentrating on Serb forces in Kosovo, while the latter wanted to destroy high-value targets in Belgrade with heavy attacks. Lambeth considers the eventual campaign—the combined approach developed by Clark with incremental escalation intended to maintain Allied solidarity—as a mistake influenced by exaggerating the impact of airpower on the Dayton Accords.

Lambeth does not consider the disjointed air operations launched to help Kosovo worthy of the designation *campaign*. But the bombing revealed weaknesses in NATO capabilities, especially



Last exit
in Belgrade.

AP/Wide World Photos

electronic warfare and suppression of air defenses, flexible targeting of ground forces, and interoperability. Serb air defenses remained a threat throughout, and the air war had almost no effect on actions by Serb forces within Kosovo. Despite these deficiencies and the wrong strategy, the ability of airpower to destroy fixed dual military-civilian infrastructure targets in Yugoslavia, helped by the indictment of Milosevic and the loss of international support, eventually induced the dictator to accept the terms offered by the Alliance.

While the strength of the analysis by Lambeth is its operational assessment of Allied Force, Stephen Hosmer advances a particularly comprehensive strategic analysis of the air war impact in *The Conflict Over Kosovo: Why Milosevic Decided to Settle When He Did*. He sets out to explain why Milosevic did not settle earlier or hold out longer and argues that the Serb leader believed that accepting the Rambouillet terms would endanger his regime and that NATO could not conduct a sustained air campaign because of Russian pressure and coalition weakness. He expected to get better terms by holding out.

Hosmer argues that Milosevic and his henchmen eventually conceded because they viewed the Allied offer of June 3 as an ultimatum preceding a genocidal air campaign that would devastate Yugoslavia. The gradual Allied buildup, escalating attacks, and bombing of targets that the Serbs considered to be civilian persuaded them that the coming assault

would cause immense hardship and imperil their rule. Milosevic believed his war-weary people would support a decision to avoid more intensive bombing; moreover, he could maintain that the new terms were less severe than the conditions offered at Rambouillet. Unlike Lambeth, Hosmer believes the gradual increase in bombing allowed pressure to build, which would not have happened if Short had been allowed to hit harder earlier. It also ensured the solidarity of the Alliance, which was the center of gravity for the coalition.

The authors differ over the lessons for jointness. Lambeth laments the loss of the ground option at the beginning of the air campaign. But its main use would have been to prevent Serb ground targets from dispersing to hide from bombs, and the errant strategy achieved the desired results anyway, though with considerable delay. Some have argued that signs of an impending land invasion helped persuade Milosevic to settle, but Lambeth discounts the possibility because no ground attack could have been executed for months. Hosmer, in contrast, concludes that the ground threat persuaded the Russians to abandon the Serbs and voice dire warnings of an intense NATO assault, magnifying Serb fears of attack and of diplomatic isolation. The motivations and effects of Russian actions deserve further study.

By contrast, Stephen Hosmer takes the lessons learned too far, reading into

Lieutenant Colonel Conrad C. Crane, USA (Ret.), is the author of *American Airpower Strategy in Korea, 1950-1953*.

history that airpower had been the main coercive instrument in Japan, Korea, Vietnam, Iraq, and Bosnia. Still, the experience of Kosovo offers provocative insights for the future. As much as Lambeth wants to use the Gulf War as the model for the proper application of airpower, future opponents are much more likely to be as smart as the Serbs than as inept as the Iraqis. And Lambeth concedes that political constraints will probably make gradualism the standard method for applying military force. He wants the Air Force to increase its targeting capabilities against ground forces but acknowledges that airpower "is, at bottom, a blunt instrument designed to break things and kill people" and had its greatest effect against Yugoslavia's dual-use infrastructure. Lambeth is not prepared to consider the implications of such an airpower strategy, but Hosmer is. He concludes that "attacks or threats of attacks on 'dual-use' military targets may be the most effective—and in some instances the only feasible way—to coerce enemy decisionmakers to terminate conflicts and crises rapidly on terms acceptable to the United States." American political leaders must avoid incurring international and legal obligations that could limit such targeting options, while military leaders must continue to pursue ways to limit collateral damage and civilian casualties.

Echoing Giulio Douhet, Hosmer argues that infrastructure attacks can quickly end wars and save both friendly and enemy lives. He is surprised that Serb leaders viewed NATO air attacks as unconstrained while American airmen chafed under what they regarded as debilitating restrictions. However, many Europeans and most of the Third World held positions similar to the Serbs. U.S. leaders must realize that the international community views bombing differently. While briefers at the Pentagon stress the accuracy of precision guided munitions, other

observers recall the horror of Hamburg and Dresden or Tokyo and Hiroshima—memories that are actually evidence of the coercive influence of airpower.

Hosmer argues that the attacks on infrastructure also pressured Milosevic by weakening his control mechanisms and imposing costs on Serbian political elites, but the core of the campaign involved disabling an economy already eroded by sanctions. The author deserves praise for locating Serbian sources, which if believed, reveal that the fear of mass death or destruction was crucial to NATO success. Even if the goal of air attacks was coercion by increasing civilian hardships, it would still raise normative issues on the use of such a strategy. One Pentagon spokesman speculated that the main reason for air effectiveness "was the increasing inconveniences that the bombing campaign was causing in Belgrade and other cities." The inconveniences included nationwide power disruptions and the destruction of petroleum refineries, half of the television and radio broadcasting capacity, and more than half of the bridges over the Danube.

The implications of a strategy that targets infrastructure and threatens civilians, even when it represents an optimum use of airpower, are troubling. The U.N. International Criminal Tribunal considered investigating allegations of war crimes stemming from those attacks, and a committee of the British parliament observed that the Allied action was "of dubious legality in the current state of international law." Beyond such criticism, the air campaign generated a severe backlash against the West in Serbia. Rather than producing a quick victory, such a course of action may in fact encourage potential enemies to develop weapons of mass destruction. Some believe that this rationale motivates North Korea, most of whose cities were destroyed by American airpower between 1950 and 1953. **JFQ**

STATECRAFT AND MARITIME POWER

A Book Review by

THOMAS G. MAHNKEN

Seapower as Strategy: Navies and National Interests

by Norman Friedman
Annapolis: Naval Institute Press, 2001.
352 pp. \$36.95
[ISBN: 1-55750-291-9]

As noted observer of naval and maritime affairs, Norman Friedman has produced a score of books and is a regular contributor to the *Proceedings of the U.S. Naval Institute*. In *Seapower as Strategy: Navies and National Interests*, he explores the strategic implications of naval power and echoes a maxim of Francis Bacon: "He that commandeth the sea is at great liberty and may take as much or as little of the war as he will."

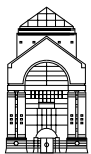
The author maintains that the flexibility inherent in seapower is its greatest strategic asset. The way that navies contribute to success has changed little, according to Friedman. Drawing on events of the past three centuries, he discusses how navies engage enemy fleets, conduct blockades and embargoes, protect against invasion forces, and project power overseas.

The heart of *Seapower as Strategy* is an analysis of maritime power in two world wars and the Cold War. Moreover, Friedman looks at the role it might have played through a consideration of strategic alternatives available to belligerents. He concludes, for example, that the Gallipoli landing was flawed in execution, not concept. Had that amphibious operation succeeded, it might have kept Russia in the conflict, thus relieving German pressure on the western front. In opening up the Black Sea and the mouth of the Danube, it might also have allowed the Entente to knock Austria-Hungary out of the conflict.

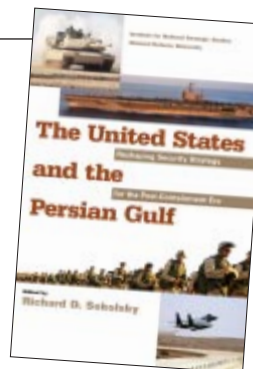
On the other hand, Friedman may be too critical of the British commitment to the European continent, which robbed London of flexibility. He argues that Great Britain could have, or indeed

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should have, allowed Germany to overrun France. But while the British might have survived such a disaster, as it did in 1940, statesmen and soldiers clearly found this outcome unacceptable. That was not because of ignorance of seapower, but instead a recognition of the dire consequences of German dominance. In fact, this case illustrates that those nations that possess seapower are not always at liberty to take as much or as little of the war as they wish.

Another focus of *Seapower as Strategy* is coalition warfare. Friedman finds a natural division of labor between maritime power and continental allies. The United States, like Britain in the past, should remain an offshore balancer, with its allies fielding the bulk of land forces. Although perhaps correct in theory, the author ignores the practical difficulties of such a division. Continental allies have been reluctant to supply cannon fodder for a distant maritime power. Just as Britain discovered in the Napoleonic era, monetary inducements and naval support are often not enough to maintain coalitions. A maritime power must often put boots on the ground as much to demonstrate political commitment as to ensure military effectiveness.

Friedman is best when he turns to technology and force structure. Two appendices, worth the price of the book, offer a wealth of knowledge for laymen as well as experts. He speculates on the relevance of traditional concepts for network-centric operations, which he notes resemble conventional naval warfare. Unfortunately, he does not pursue the theme. More debatable is his contention that contemporary trends decrease the value of landpower and airpower and increase that of seapower. He may be right, but Kosovo and Afghanistan suggest otherwise.

The author offers little critical analysis of the theory of seapower advanced by Alfred Thayer Mahan, with its emphasis on decisive fleet engagement. Friedman chastises Britain, for example, for failing to press home maritime victories, yet he sidesteps the question of *why* a nation with seapower often fails to seek out and destroy enemies. Great Britain relied on the Royal Navy not only for power projection, but also to safeguard its shores from invasion. It is very well to claim that "it is our task to ensure that a decisive battle goes our way," but such statements are not helpful to leaders charged with providing national security. It is not surprising that dominant maritime powers

have frequently been reluctant to seek decisive victories.

Friedman tends to generalize when it is unwarranted. Is it really true that only rarely, if ever, has the United States fought to gain or retain territory? And the result of Enduring Freedom seems to contradict the claim that "we now lack the mass necessary to overrun, let alone occupy, even a moderate-size country." Moreover, he poses strange assertions, including that North Korea and India were in cahoots with Iraq during the Persian Gulf War. The latter point is particularly misplaced given that traditionally neutral India took the unprecedented step of granting landing rights to the United States during Desert Shield. But placing such reservations aside, *Seapower as Strategy* is a valuable synthesis of three centuries of war at sea. **JFQ**

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CHINESE NAVAL POWER

A Book Review by

LARRY M. WORTZEL

The Great Wall at Sea: China's Navy Enters the Twenty-First Century

By Bernard D. Cole

Annapolis: Naval Institute Press, 2001.

288 pp. \$34.95

[ISBN: 1-55750-239-0]

To fill a gap in literature on the People's Liberation Army (PLA), *The Great Wall at Sea: China's Navy Enters the Twenty-First Century* by Bernard Cole surveys the maritime tradition, defense base, and role of seapower in China. Despite its strengths, some of the judgments found in this book on the long-term intentions of the naval buildup are questionable. The author—who teaches at the National War College and served as a surface warfare officer—believes that China has limited goals while others, such as the reviewer, think they have strategic ambitions. But no one who follows maritime strategy and Chinese military affairs should ignore this book.

Cole thinks that a combination of strategic view, budget constraints, foreign relations, and domestic political affairs means China will modernize its force to become a strong regional rather than global navy. And he does not anticipate Beijing projecting its power around the world in the future. The author bases this conclusion in part on the contention that China has not traditionally maintained an overseas military presence.

There is little doubt about the long-term Chinese military involvement in the construction of launch facilities for intermediate range ballistic missiles in Saudi Arabia; there may still be PLA personnel supporting them. The Tan-Zam railway between Tanzania and Zambia was built by Chinese engineers as a foreign aid project. The Chinese People's Volunteers who invaded Korea remained on the peninsula for years after the war. And there were some 50,000 Chinese soldiers in North Vietnam during the Indochina conflict, and PLA forces constructed a

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PLA destroyer
visiting Guam.



U.S. Navy (Nathanael T. Miller)

road across northern Laos toward the Thai border. On such matters Cole seems to accept the official Chinese party line; part of his analysis minimizes the long-term military designs of Beijing.

The interpretation of Asian history in *The Great Wall at Sea* is also questionable. Chinese fleets carrying invasion forces attempted to penetrate Japan in 1274 and 1281. Only a typhoon, the proverbial *kamikaze* (divine wind), stopped their assault. The establishment of trading colonies around Asia and the Middle East were also based on naval power. Admiral Zheng He (1371–1433) led seven expeditions. His fleets included hundreds of ships and thousands of troops dispatched to impose the will of the Middle Kingdom on trading states. When a Chinese admiral showed up with more ships than had ever been seen and landing forces larger than the local military, requests for commercial treaties invariably followed. This hardly constitutes a pacific maritime tradition.

Moreover, Cole does not examine Chinese literature, but relies extensively on translations by the Foreign Broadcast Information Service and other sources. There is no reference to Chinese work in the notes or bibliography. When authors lack a working knowledge of the vernacular of their research, they normally enlist the services of a collaborator with the requisite linguistic skills. For this lapse, the Naval Institute Press bears some of the blame for not insisting on a

survey of the major PLA sources in the original language.

Scholarship aside, Cole is right when it comes to military-technical analysis. The Chinese defense industrial base remains weak. Moreover, Beijing has focused on other sectors, perhaps at the expense of near-term military expansion. As the author observes, China is buying what it needs for the navy. Because it cannot manufacture sophisticated turbine engines and power systems, it must depend on foreign sources. It is also unable to build precision targeting and combat management systems and so depends on the West and Russia.

Thus the picture is mixed. When it had the strongest fleets in the region, China exercised suzerainty over its neighbors. Today it is seeking an indigenous naval industrial complex. There is no reason to think that Beijing will limit its ambitions once its goals are met. All those interested in maritime power should read this book. However, its judgments on long-term intentions should be tempered by further study of Chinese military and naval history.

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WARS AND RUMORS OF WARS

A Book Review by
JAMES JAY CARAFANO

The Road to Rainbow: Army Planning for Global War, 1934–1940

by Henry G. Gole
Annapolis: Naval Institute Press, 2003.
256 pp. \$34.95
[ISBN: 1-55750-409-1]

Drawing on archives at the U.S. Army War College, Henry Gole has provided a revisionist interpretation of war planning on the eve of World War II. In *The Road to Rainbow* he argues that serious planning for coalition warfare began earlier than commonly assumed. In making his case, Gole assembles a wealth of new material on American preparations for global war, though his conclusion that Army leaders were then capable of meeting the challenges of a two-front war will likely spark lively debate.

War plans are developed in a shadowland. Preconflict planning does not usually capture the attention of historians for a good reason. The actions of states in a conflict often diverge from prewar thinking. Structures considered inviolable fade once the first shot is fired. Nations at war find themselves acting in ways that they would not countenance in peacetime. Conversely, unconstrained planning without oversight tends to diverge from the art of the possible to little more than an academic exercise. Plans are so dissimilar from combat that they usually become footnotes to history. One exception is the Schlieffen Plan, which some believe was a catalyst for World War I.

Gole contends that the United States was better prepared for war than historians previously thought. Sidney Aster, for example, concluded in *Military Planning and the Origins of the Second World War* that “Americans felt so secure after the First World War that their planning, until 1938, was small scale and focused on hypothetical hostile powers.” Not so, according to Gole. At least as early as 1934 the military was looking at realistic options for fighting Japan and later Germany. Long before Admiral Harold Stark,

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Chief of Naval Operations, promulgated his famous Plan Dog memorandum in 1940, Army thinking envisioned a two-front war, the need for coalition partners, and defeating Germany first.

Sorting through the contents of 25 footlockers at the U.S. Army War College, Gole found student papers from 1934 to 1940 on allied participation. Much of the research evaluated the Color Plans, predecessor to the better known Rainbow Plans, which a joint Army-Navy board began drafting in April 1940. While the papers concerned exercises, Gole claims that they were relevant to war planning. Before World War II, the college was located at Washington Barracks (now Fort Lesley J. McNair). Much of the research was done at the behest of the War Department, which tasked students to examine strategic planning. When the college closed its doors in 1940, faculty and many graduates were assigned to the war plans division. In addition, students who worked on Allied planning advanced to fill senior command and staff positions (Gole provides a detailed list of graduates in an appendix).

The Road to Rainbow contains a wealth of new information, but the book misses opportunities to explore its subject in detail because of its problematic organization and the failure to make full use of the research material on hand. Part one sketches the state of military preparedness, general staff planning, and educational activity between the wars. While interesting, this history is rehearsed elsewhere. It would have been more helpful if integrated into analyses of war planning exercises to illustrate the influence of real world events and constraints on student thinking.

The core of this book covers each year of the curriculum, from the study of war with Japan in 1934 to requirements for hemispheric defense in 1939. The balance of the chapters summarize events after the outbreak of hostilities and activities of the War Department. This chronological approach is tedious, and overarching themes of the work are easily lost.

The archives of the U.S. Army War College also include instructor critiques, student comments, and interaction with the War Department. This data provides evidence for assessing the worldview of men who fought long and hard on two fronts and shaped the Cold War. The plans should be sifted not only for insights on operational thinking but for notions on technological advances and geopolitics, as well as the assumptions that underpinned military decisions. Few

analyses of prewar planning root out such material in detail. *Arming Against Hitler: France and the Limits of Military Planning* by Eugenia Kiesling is one work that ventures into this area. Gole largely missed his chance.

Finally, the general conclusion of this book will likely provoke discussion. Gole finds that the skills of coalition warfare were ingrained in war college students and suffused in the thinking of the Army Staff. If true, it is unclear why participation in coalition planning in the opening years of the war was so flawed. The Army advocated a cross-channel invasion in 1942, which would have resulted in one of the greatest military disasters in history. The poor performance of American soldiers in North Africa should have been sufficient proof that they were not ready. In addition, if planners had such a thorough conception of global war in 1939, why were they outargued and outflanked by British planners at the Casablanca Conference in 1943?

Gole rightly draws attention to student work on the eve of Pearl Harbor. Yet too much can be made of the musings of

war college students. Many of these officers had also attended the U.S. Army General Command and Staff College where the study of coalition operations during World War I led to the conclusion that "if we have to go to war again, let's do it without the allies."

In a work of related interest, *Allies and Adversaries: The Joint Chiefs of Staff, the Grand Alliance, and U.S. Strategy in World War II*, Mark Stoler looks at planning from 1939 to V-J Day. While finding that the military was not devoid of intellectual horsepower to conceptualize global warfare, he perceives less coherence than *The Road to Rainbow* would lead readers to expect.

There are wars and rumors of wars—and there are war plans. Each has a place in military history. *The Road to Rainbow* is a powerful reminder that coalition planning is essential to grooming strategic leaders. The years leading to World War II provide a valuable case study on harnessing the instruments of national power in a changing world.

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