

## Chapter 17

# Alternative Force Structures and Resource Constraints

**D**esigned to provide food for thought rather than policy recommendations or budgetary prescriptions, the following chapter envisions different configurations for different challenges. It starts with a brief overview of how each of the four Services and special operations forces must adjust if we assume hybrid wars are the primary challenges we face. Following that survey, we consider how the U.S. Army must change to deal with continuing counterinsurgency and stability operations while maintaining the capability to fight a conventional opponent.

Next, the chapter examines the Navy's very different set of problems. First, its planned fleet is simply unaffordable. Second, the fleet is a poor match for the challenges the Navy is facing. Thus, this section recalls lessons from the past in how to overcome the cost issues and proposes a different organization to face the second challenge. As always, the Marine Corps literally straddles the two environments and must be prepared to play an active role in both. The

section on the Corps focuses on its role in winning the current conflicts while simultaneously reequipping and modernizing to deal with future threats.

This chapter's discussion of the Air Force highlights how our hard-gained air superiority has been critical to the success of U.S. arms. But it cautions that the Air Force faces major budgetary issues as it tries to replace an aging aircraft fleet while assuming additional duties in space and cyberspace as well as augmenting ground forces in Iraq and Afghanistan.

The next two sections deal with personnel issues and the budget. Demographic and social changes reinforced by persistent conflicts are challenging Service abilities to recruit sufficient high-quality personnel to meet needs. Budgetary pressures from entitlement programs are set to rapidly grow and will force a reassessment of national priorities. The final section discusses how the Pentagon can balance risks and costs in the long run to meet current demands, while posturing the forces to meet future challenges.



U.S. Marine Corps (Keith A. Stevenson)

Amphibious assault vehicles approach beach to disembark Marines and equipment during exercise off Florida coast

### Force Structure Implications of Hybrid Warfare

*Hybrid warfare* is a reaction to the overwhelming superiority of American arms and the leveling impact of globalization. Through its dominance of conventional warfare, America has pushed future opponents to alternative means purposely designed to thwart conventionally oriented Western societies and their military forces. This approach is designed to sidestep America's kinetic forces by changing the rules of the contest. In this new hybrid of war, cunning savagery, continuous organization, and tactical adaptation will be the only constant. As a result, American force planning needs to be examined within a framework that accounts for both the enduring potential of state-on-state conflict and the more likely, but much less threatening, cases of intrastate conflict and failed states.

#### *Army*

To meet the complexity of indirect and hybrid threats, the Army envisions developing capabilities to execute decisive combat operations, as well as responding to the unexpected and unpredictable. It intends to balance expeditionary agility and staying power for the long fight regardless of its nature. This moves the Army away from its predisposition to set piece battles against predictable enemy forces. Appropriately, the individual Soldier is the centerpiece of this transformation. In terms of organizing for the future, the Army anticipates the need for greater agility, which will be gained by promoting modularity of brigade-sized units while placing more emphasis on combined arms at lower echelons.

Although the Army appears to be adapting in terms of concept development, force structure changes and the Future Combat System (FCS) do not completely satisfy the requirements of hybrid warfare. The FCS program offers connectivity, surveillance, unmanned systems, and force protection for the battlefield of tomorrow. The principal advantage of this transformation is the evolution from the division-based structure to Brigade Combat Teams (BCTs), which have modularity instead of ad hoc task organization. These units are self-sufficient, cohesive, and readily deployable. Their design also provides improved tactical integration at lower levels, which will be ideal in meeting the challenge of hybrid threats as well as accomplishing future stabilization operations.

However, the Army remains focused on major combat operations and a heavy force structure. In addition, to afford the brigade headquarters over-

head, the Army removed the third maneuver battalion in many brigades. A smaller number of properly manned BCTs would be better suited for operations that call for boots on the ground. Furthermore, the Army has declined to establish dedicated training and advisory groups, which is a decision that must be reconsidered. Besides establishing standing regional headquarters and military advisory groups to conduct stabilization operations, some portion of the force, at least five BCTs, should be assigned as the base component for an increased national capability to conduct preventative or postconflict stability operations in concert with the range of other available instruments of national power.

#### *Navy*

After the Cold War ended, Navy leaders optimized the battle force for power projection operations against state opponents with weak navies. They essentially ignored the low end of the conflict spectrum, as indicated by their outsourcing of riverine warfare to the Marines and their plans to eliminate both frigates and Patrol Coastal ships from the battle fleet. As a result, fleet building plans emphasized high-capacity strike platforms, including aircraft carriers and large, expensive, multimission combatants. It was not until 2001 that the Navy inserted the Littoral Combat Ship (LCS)—a small modular combatant—back into its long-range plans. But consistent with the Navy's vision of future warfare at sea, the ship was designed for countermine, anti-submarine, and antisurface warfare during a theater break-in operation, not for operations at the low end of the naval conflict spectrum.

For the past few years, the Navy's principal conceptual approach had been built around an umbrella concept called Sea Power 21, developed by then-Chief of Naval Operations Admiral Vernon Clark. The fleet architecture to bring Sea Power 21 to fruition has been defined in the Navy's shipbuilding program. While revolutionary in its technological base, the program was conventional in its ship mix and leaned heavily toward blue water operations and long-range precision strike from aircraft carriers. In fact, by the time he retired, Admiral Clark concluded that the current Navy fleet was neither balanced nor optimal for making material contributions to the war on terror or against future irregular adversaries.

By 2005–2006, things had begun to change. The long campaign in Iraq, Iran's clever use of submarines and surface ships, advanced antiship weaponry, and small, swarming boats, as well as Hizbollah's

ability to employ C-802 antiship cruise missiles in the 2006 Lebanon War, all demonstrated the growing threat of maritime hybrid threats. As a consequence, the Navy reclaimed the riverine mission from the Marines; provided more than 10,000 Individual Augmentees to ground force commanders in Iraq and Afghanistan; scrapped plans to retire the Patrol Coastal ships; modernized 30 frigates to serve through the end of the next decade; converted four *Ohio*-class ballistic missile submarines into conventional cruise mission and special operations transport submarines; expanded its Naval Special Warfare capabilities; and stood up the new Naval Expeditionary Combat Command (NECC), a “type command” responsible for organizing, training, and equipping a variety of forces employed on both the seaward and landward sides of a coastline.

The Navy has explored some innovative ship designs, and is now belatedly looking at its contributions to the war on terror and hybrid threats. It has jumpstarted its regional affairs program, riverine warfare, humanitarian assistance tasks, and Civil Affairs efforts to make a more significant contribution to global campaigns. Nonetheless, despite these welcome moves, maritime hybrid warfare capabilities generally remain at the bottom of the Navy’s budgetary priorities. The principal complaint about the Service has been its overemphasis on and overinvestment in deep-water sea control operations, and its heretofore studious avoidance of littoral and riverine operations.

The Navy’s program continues to emphasize platforms and capabilities for high-end naval combat against nation-state opponents. As a result, funding for many of the NECC’s capabilities is included in supplemental budgets rather than the Department of the Navy base budget. The Navy has stood up only 3 riverine squadrons of 12 boats apiece. Similarly, despite the LCS’s great potential, the Navy’s program lacks mission packages for special operations support, humanitarian and disaster relief, naval partnership-building, or support for Marine advisory and training teams.

In the midrange, the Navy’s major surface investments have focused on a replacement “destroyer,” the DDG-1000. This *Zumwalt*-class land attack destroyer is about 50 percent larger in displacement and 5 times more costly than the DDG-51 *Burke*-class vessel that it replaces. It is a technological marvel, with its electric drive engine program, superior radar and signature control, and Advanced Gun System, which provides two fully automated 155mm guns capable of firing global positioning system-guided rounds 83

nautical miles ashore from a 600-round magazine. The Navy is particularly keen on the ship’s automation and minimal crew requirements, reduced from 350 to as low as 120. However, the size and cost of the program—\$4.4 billion per unit—threaten its survival.

The Navy must not totally ignore the high end of the naval conflict spectrum. The undersea competition is changing, and may be on the verge of a major shift involving unmanned underwater vehicles. Similarly, the Navy is now engaged in an intense, albeit politically understated, naval capability competition in the Western Pacific with the People’s Republic of China, including systemic Chinese efforts to develop antinaval theater denial capabilities. Making sure the United States does not



U.S. Air Force (Adam M. Stump)

Secretary Gates, Admiral Mullen, General David Petraeus, and General Ray Odierno during change of command ceremony, Baghdad, September 2008

fall behind in that competition is a prerequisite for stability and crisis response in the region. Moreover, as the aforementioned example of Hizbollah’s employment of antiship cruise missiles shows, there is a steady, ongoing global proliferation of advanced guided weapons and battle network technologies that will challenge any future U.S. naval operation in ways not seen since World War II. However, it seems fair to say that the Navy’s program needs to be better balanced to include additional low-end, hybrid, and high-end naval threats. In other words, emphasis on new hybrid threats should shift some of the focus of the Navy’s investment portfolio away from the Global Maritime Commons and traditional deep blue water operations to the more likely

contested zones in the world's littorals. A standoff fleet strike capacity will still be important, and the modern aircraft carrier will remain the centerpiece of the U.S. naval power projection fleet. However, the fleet clearly has overcapacity in fleet strike capabilities, and just as clearly lacks capacity in low-end and hybrid naval capabilities.

A key component for any Navy intent on addressing hybrid maritime threats is the naval maneuver fleet, consisting of amphibious warfare ships, maritime prepositioning ships, and joint sealift platforms. This maneuver fleet will have to remain robust, as it is the Navy's most versatile component. The ability to command external lines of communication and operate from the oceanic periphery; to establish sea bases for our forces near crisis areas without having a large footprint ashore; and to put ground forces ashore to deal with pirates and other nonstate maritime actors operating from land will be important components of future naval operations.

### *Marine Corps*

As an expeditionary force, the Marines are well disposed in terms of their culture, doctrine, and force structure to deal with hybrid threats. In particular, the combined arms approach and ability to operate in a decentralized manner set them up for success. Investments that currently position the Marine Corps to retain its unique naval character

could be better allocated to fixing chinks in its armor for countering more lethal and irregular enemies.

In adapting to the 21<sup>st</sup> century, the concept of the Marine Air-Ground Task Force (MAGTF) should be retained but its focus shifted from rare major combat operations to likely deployments requiring sustained expeditionary capabilities in the urban littorals. The Marine Expeditionary Force (MEF) force design must be retained as a reservoir for rapidly tailored forces for various contingencies but must be augmented. MEFs lack an information warfare battalion, a reconnaissance, surveillance, and target acquisition battalion designed to augment reconnaissance companies, and unmanned sensor assets (both ground and aerial systems). In addition, each MEF organization requires a security cooperation group that contains foreign military training and advisory teams and Civil Affairs units.

The second major shift required for a small wars era involves training and manpower paradigms that govern daily operations. The Marine Corps heavily invests in its junior officers but does not make comparable training and education programs available to its enlisted members. If the Corps believes in the strategic impact of small units, then it must invest to make the *strategic corporal* a reality, which some allied militaries have done already, and not simply a bumper sticker.

Current acquisition by the Marine Corps is well settled, particularly the Joint Strike Fighter (JSF) and tactical ground mobility programs. But consideration should be given to limiting purchases of the V-22 Osprey while focusing on assault support assets better suited to urban environments. The Osprey is a superb platform for special operations and deep assaults when speed requires protection and agility. But it may not be nimble enough if urban littorals become the default operating environments in the future. Instead of optimizing its force design for the ship-to-shore challenge, the Marine Corps could focus on deploying more effective forms of force protection once ashore.

### *Air Force*

America's military dominance over the last several decades has been enhanced by its relentless pursuit of aerospace superiority. This capability cannot be taken for granted and needs continuous investment to preserve a competitive advantage. Hybrid threats will not diminish the relevance of airpower. But that dominance must be shaped to provide for



U.S. Navy (Bobbie G. Attaway)

Marines from Fleet Antiterrorism Security Team Pacific perform battle drill against simulated base perimeter breach

relevant strategic and operational effects necessary for unrestricted warfare. This will require the Air Force to expand its capabilities in space and cyberspace as well as a modern long-range strategic strike capability. Admittedly, there will be fewer threats to air superiority. The current plans for the F-22 Raptor should be curtailed at approximately 200 airframes because its contributions to precision strike and ground attack are dubious at best. U.S. air superiority will rarely be tested in a meaningful way, except by sophisticated air defense systems and even more often by low-tech Man-Portable Air Defense Systems as well as attacks against airfields.

The Air Force has already made some adaptations that prepare for future threats. The Service has improved its expeditionary capability as well as its posture for cyber warfare operations. Its development of unmanned aerial vehicles (UAVs) is first rate. In a completely irregular world, the requirement for precision engagement, especially in urban settings, will continue and perhaps increase in value. Thus, a modernized gunship, either manned or unmanned, has merit given the great success of AC-130s in current operations. Such a vehicle, an airborne Guardian Angel, would combine the advantages of persistent surveillance with pervasive attack.

### *Special Operations Forces*

Afghanistan provided a renaissance for special operations forces. Teams of these warriors built relationships with the Northern Alliance and applied firepower against the Taliban. Subsequently, numerous cases of valor and improvisation testified to the effectiveness of special operations against deft enemies. As a result, these units have developed sophisticated capabilities across a range of operating environments. They must continue to work with foreign militaries and remain agile enough to conduct surveillance and operate against high-value targets even in dense urban areas. Although special operations forces have gotten more resources, they need training, education, staff processes, and aviation assets to enhance their capabilities.

Iraq and Afghanistan have provided an experimental laboratory for potential enemies, who adapt to what works and pursue the fusion of modern capabilities and irregular tactics until they perfect unique styles of warfare. Many if not all capabilities will be required to counter hybrid threats, but the mix of capabilities and force structure should be shaped to better reflect the needs of joint force commanders to defeat potential adversaries located anywhere in the world.

### **Outlines of a Post-Iraq Army**

Shaping virtually all other decisions that President Obama will make about the Army will be U.S. operations in Iraq and Afghanistan. The Army<sup>1</sup> has been rotating combat brigades through both countries at a rate that limits its ability to do, or train to do, anything else. There is no lack of thought in the Army about future directions, but much of that thought will stay on hold if “the future” remains Iraq and Afghanistan.

We assume a situation in which the Service can approximate the mythical 2-year dwell time between unit rotations, giving it time to prepare for the broader array of conflicts that it may face in the future. We begin with the nature of future conflict and the kind of Army we need to handle it. We then turn to the Army’s size: how large an Army do we need? And we end by examining the notion of “building partner capacity” and the advisory capability that implies. Army leaders have a good sense of needed change in these areas; the question is whether those ideas can be nurtured and sustained in the debates that surely will follow substantial withdrawal from Iraq. The Obama administration will be instrumental in making sure current directions of change are sustained.

### *Full-Spectrum Conflict, Full-Spectrum Army*

Insurgencies in Iraq and Afghanistan have confronted the Army with a form of conflict that it sought assiduously to ignore in the decades after Vietnam. Against this background, it has picked up counterinsurgency remarkably well—which is useful, since it probably will see more of these messy internal conflicts in the years ahead. If this sounds like refighting the last war, it is worth remembering that the events of 9/11 highlighted the danger of ignoring failing states. Few see Afghanistan as a war of choice, and it makes sense to hedge against other wars of that kind. Meanwhile, post-Saddam Iraq has encouraged the Army to remember that many of its past conflicts were followed by long “governance operations.” In asserting that “Establishing a stable peace after an offensive may take longer and be more difficult than defeating enemy forces,” the Army’s new Field Manual (FM) 3-0, *Operations*, embraces that long-neglected history and the strategic purpose of war: producing a better and more lasting peace.

Some Army critics think that the Service has moved too far toward counterinsurgency and is forgetting how to fight “conventional” conflict.<sup>2</sup> It is a fair point, but it begs the question what future

“conventional” conflict will look like. Precisely because the U.S. military does “high-end” maneuver warfare so well, it is hard to imagine future adversaries challenging the United States in that kind of battle. Rather, we should expect them to explore “asymmetric” approaches that neutralize our firepower, draw out conflicts, create civilian casualties, operate aggressive media campaigns, and otherwise frustrate U.S. goals.

Unfortunately, the messiness of today’s conflicts is not likely to be confined to insurgencies. We saw hints of “irregular major combat” in the initial invasion of Iraq in 2003, when Saddam’s Fedayeen posed a threat to rear areas with significant consequences for U.S. tactics, deployments, and technology. In 2006, Hizbollah employed irregular tactics in confronting Israel’s invasion of southern Lebanon. North Korea may seek to do the same should war break out there. These “irregular challenges” can appear in any kind of warfare, perhaps even alongside “regular” warfare. Thus, the Army must plan to meet the “full spectrum” of warfare in the same war, perhaps at nearly the same time.

This means, first, an army with a different balance of skills and capabilities than the balance the Army brought into the present century. It needs less armor and artillery, more military police, Civil Affairs, and support units—the “high-demand, low-density” skills of stability operations—and more infantry, which has wide utility across the spectrum. Whether infantry is “foot” or “medium weight” remains to be seen; the success of Stryker units in Iraq certainly makes the medium weight idea worth exploring.

A more serious challenge of full-spectrum warfare lies in training and leader development. Certain basic Soldier skills and character traits are universally valuable but important skills are unique to areas of the spectrum. More broadly, the mindset of traditional warfare—“destroy the enemy’s forces”—differs markedly from “secure the population,” the core mindset of counterinsurgency and stability operations. Finally, command in these latter operations tends to be flatter, with lower level commanders and Soldiers facing strategic and often complex ethical decisions. Future full spectrum war will place an enormous premium on leaders (not just officers) who can grasp, quickly, what kind of conflict they are in and shift gears accordingly.

Training takes time. The rapid rotations through Iraq and Afghanistan do not allow for this level of training. The Army has a vision of a 3-year force generation cycle (2 years training, 1 deployed, or pre-

pared to deploy) that is probably the minimum dwell time needed to impart a broad set of full-spectrum skills and then the specific skills needed for the next deployment. Given prevailing constraints on commanders’ time, Army trainers must bring training to units at a level that relieves commanders of today’s large burden of paperwork.

### *How Much Army Is Enough?*

Given uncertainties about the future and the substantial costs of adding people to the military, questions about force size are almost always controversial. Oddly, today’s debate about the size of U.S. ground forces is anchored on the Army’s post-Cold War size of 482,000 Active duty personnel. Yet this number was the product of a conception of warfare centered on rapid defeat of enemy forces—conflict in which the entire force can be brought to bear in a military confrontation. In enduring conflicts such as Iraq, by contrast, effective force size is cut by half or two-thirds, depending on rotation rate. Only by accident would the size of today’s Army bear any relationship to the likely wars of the future.

Not surprisingly, operations in Iraq and Afghanistan have forced increases in the size of America’s ground forces. After allowing a “temporary” increase of 30,000 in the Army’s size in January 2004, the Bush administration moved 3 years later to increase the Active Army’s authorized end-strength by 65,000 (with Reserve Components increasing by smaller amounts, and the Marine Corps increasing by 47,000), producing an Active Army of 547,000 Soldiers. Although recruiting to this new level initially incurred worrisome (but not catastrophic) declines in the quality of entering Soldiers, a falloff in casualties in Iraq combined with a falloff in economic activity at home seems to have eased recruiting problems. The Army is now nearing the 547,000-Soldier goal.

Is an Army of 547,000 Active duty Soldiers enough? Who knows? This is a case where “muddling through” makes good sense. People are expensive, and there is much uncertainty regarding whether and how “persistent conflict” will be handled in the future. Then again, pursuing the currently authorized increase in size makes sense in terms of present (and perhaps enduring) commitments in Iraq and Afghanistan, and as a hedge against possibly demanding commitments down the road. It is also about all the Army can be expected to recruit and retain in the time allotted. Hopefully some of these uncertainties will be resolved with the passage of time.

### *Squaring the Size Circle: Building Partner Capacity*

If an unstable world becomes less friendly to U.S. interests and more friendly to terrorists (or organized crime, or disease, and so forth), the United States may need to impose stability in countries considerably larger than Iraq or Afghanistan, which have already strained the Nation's ground forces. How does America hedge against such a world? The proffered solution these days is "building partner capacity," which in this case means strengthening the internal security capabilities of weak or threatened states so large U.S. force deployments are not needed.

The latter meaning clearly applies urgently to Iraq and Afghanistan. But Secretary of Defense Robert Gates gave the notion longer term significance in a speech to the Association of the U.S. Army in October of 2007:

*[A]rguably the most important military component in the War on Terror is not the fighting we do ourselves, but how well we enable and empower our partners to defend and govern their own countries. The standing up and mentoring of indigenous armies and police, once the province of Special Forces, is now a key mission for the military as a whole.<sup>3</sup>*

Gates added that how the "military as a whole" should handle the advise-and-assist mission "remains an open question, and will require innovative and forward thinking."<sup>4</sup> The subject certainly does not lack for that, as proposals for handling training and advising range from building an Army Advisory Corps of 20,000 Soldiers, to taking advisors "out of hide" of deployed brigades, to converting brigades to advisory groups as they go through their pre-deployment training cycle, to substantially expanding the number of uniformed experts on regions and advising.<sup>5</sup>

Some of these proposals relate directly to the situations in Iraq and Afghanistan, where the capacity-building mission aims to reduce the exposure of deployed U.S. forces. These deserve attention in their own right. But the general goal of this policy is to strengthen governance and security in host nations *instead of* deploying U.S. combat forces. Carving advisors and trainers out of deployed U.S. brigades does not apply.

Advising foreign militaries is the ultimate non-standard requirement. In combat situations such as Vietnam and Iraq, advisors have numbered in the thousands, but in Latin America and Africa, U.S.

advisory teams have traditionally been in the tens, occasionally as a result of politically imposed caps on American force levels. Some advisor teams coach host-nation units, some are lodged in the local political organization (Provincial Reconstruction Teams), and some (military training teams) move from situation to situation. The absence of a standard team makes it hard to imagine how Army brigades can consistently be reshaped into advisory teams.

If there is a "standard" requirement amid the variety, it is the need for a far better trained and educated corps of experts than the regular Army (as against the special operations forces) has been able or willing to provide in the past. If it is to have any chance of success, advising must be led by officers and senior enlisted personnel who know the culture and politics of the country to which they deploy, and ideally know the language well. They should be adept at advising (not everyone is), and willing to deploy for more than a year. Those advising foreign military units ideally should have U.S. operational experience; they should be "operator-experts" who advance in the standard command track while also picking up advisory experience. These experts will be the core of advisory teams assembled in accordance with the needs of each particular mission.

This amounts to a call to substantially broaden the education and experience of officers as they rise through the ranks. Leader development actually narrowed after the Cold War ended, with fewer attending graduate school or serving outside Army units.<sup>6</sup> Senior Army officials want to reverse that trend, but they will need support from the civilian leadership. Careers are already stuffed with mandated assignments; if building partner capacity is a top national priority, it has to be given precedence. It may be that the Nation needs to consider lengthening military careers beyond currently mandated lengths. These are not issues that the Army can address by itself.

The Army also will need support in raising the status of "advising" in an organization that has always valued command of U.S. units. In a recent email to the organization, Chief of Staff General George Casey sought, among other things, to "put training on the same footing as other kinds of assignments when it comes to promotions."<sup>7</sup> This is a good move, but it may not be taken seriously; the last time a chief of staff tried this—in the late 1960s—the admonition was forgotten by the time promotions boards met in the early 1970s.<sup>8</sup> If this is the direction in which the Nation wants to move, it will take more than a single Army chief of staff to make the policy stick.

*The Future of the Army*

The Army does not need to be wrenched around to face in the proper direction. To the contrary, the Army as an institution appears to have a good grasp of what it must do to prepare for the future. The new FM 3-0 embraces history, strategy, and stability operations. The chief of staff’s missive on the value of advising recognizes the need to give this function higher status. And of course the Army’s performance in Iraq and Afghanistan, adapting to modes of conflict ignored or scorned only a decade ago, lays the groundwork for an Army able to tackle the more complicated and “irregular” forms of conflict the Nation is likely to confront in the future.

Hence the Obama administration’s mission should be one of ensuring that the organization sticks to the general course it has chosen. Anyone aware of the Army’s history knows how ephemeral many of the changes now proposed may be—particularly amid the national security debates that will follow

a substantial withdrawal from Iraq. Field manuals change and dictates from higher headquarters can be amended or quietly forgotten. The Obama administration must ensure that the Army continues to explore the new intellectual and operational territory it now occupies.

Four areas in particular need sustained attention by the Obama administration. First is the effort to broaden officer development paths, ultimately making them richer and more varied than during the Cold War. The administration should be willing to consider lengthening officer careers as a means to this end. Second, and relatedly, the operator-experts that emerge from this broader development process need to be rewarded for service as advisors. Third, rebalancing the force away from the dominance of the combat arms, or at least armor and artillery, will need high-level support. Finally, the way in which the Army delivers “full-spectrum” training as operational tempo allows will need careful attention and analysis.

**Table 1. Current and Future Navy Fleets**

Ship Type	283-ship Fleet	313-ship Fleet	357-ship Fleet
Aircraft carriers (CVs, CVNs)	11	11	10
Escort carriers (CVEs)	0	0	4
Nuclear-powered ballistic missile submarines (SSBNs, SSBNXs)	14	14	12
Nuclear-powered cruise missile and special operations transport submarines (SSGNs)	4	4	6
Nuclear-powered attack submarines (SSNs)	53	48	48
Guided missile cruisers (CGs, CGXs)	22	19	0
Guided missile destroyers (DDGs, DDGXs, DDG-1000s)	55	69	0
Large Battle Network Combatants	0	0	80
Frigates (FFs)	30	0	0
Mine countermeasure ships (MCMs)	14	0	0
Littoral Combat Ships (LCSs)	1	55	55
Large-deck amphibious assault ships (LHAs, LHDs, LHARs, LHDXs)	10	9	11
Amphibious landing ships (LSDs, LPDs)	21	22	22
Maritime prepositioning future squadron (T-LHA/LHD, T-AKE, LMSR, MLP)	0	12	0
Combat logistics force ships (T-AE, T-AFS, T-AKE, T-AO, T-AOE)	31	30	31
Support ships	17	20	29
Maritime Security Force ships	0	0	49

Source: Naval Vessel Register, available at <[www.nvr.navy.mil/nvrships/FLEET.HTM](http://www.nvr.navy.mil/nvrships/FLEET.HTM)>.

## A New Competitive Strategy for Enduring Naval Superiority

The U.S. Navy's 283-ship battle force is the most powerful on Earth (see table 1). This force includes 11 aircraft carriers capable of launching and landing conventional jets, and 10 amphibious assault ships capable of operating short takeoff and vertical landing (STOVL) jet fighters, tilt-rotor aircraft, and helicopters. No other navy operates more than four such ships.<sup>9</sup> Its tactical submarine fleet numbers 56 nuclear-powered boats (52 attack boats and 4 cruise missile submarines)—11 more nuclear boats than those found in all foreign navies.<sup>10</sup> Its 77 multimission guided missile destroyers and cruisers carry about the same number of missiles as do the 367 surface combatants operated by the next 20 largest navies. Its 31-ship amphibious warfare fleet can land 2 Marine Expeditionary Brigades, and its 32-ship combat logistics force (CLF)—a mix of fuel tankers, ammunition, and supply ships—gives the Navy a global reach and staying power unmatched by any other navy. Not included in the 283-ship count is a 110-ship prepositioning and sealift fleet operated by the Military Sealift Command, representing 95 percent of the world's militarily useful sealift.<sup>11</sup> Nor does it include approximately 160 Coast Guard cutters and patrol boats.

Despite its great strength, the Navy believes that its battle force is too small given the demands on the fleet. The recently published *Cooperative Strategy for 21<sup>st</sup> Century Seapower* declares that preventing wars is as important as winning them.<sup>12</sup> As a consequence, it emphasizes persistent global presence and maritime security and humanitarian assistance operations. This strategy entails larger numbers of ships and different types, too, including ships and craft capable of operating in the brown and green waters of the world alongside smaller, less capable navies. Given these tasks, as well as those associated with the current two-war joint standard, the Navy wants its future battle force to be *no less* than 313 ships (see tables 1 and 2).<sup>13</sup>

The likelihood that the Navy will achieve this future goal is low. Since fiscal year (FY) 2003, the Navy has spent about \$12.6 billion a year on shipbuilding. The Congressional Budget Office estimates the Navy's FY09 30-year plan to build a 313-ship fleet would cost an average of \$27.4 billion a year.<sup>14</sup> Given likely future budgets, few observers believe that the Navy will be able to allocate such large sums to its shipbuilding efforts.<sup>15</sup> Even the Secretary of the Navy has said that unless the Navy designs and builds more affordable ships, the chances that it will be able to build up and sustain a larger fleet are poor.<sup>16</sup>

**Table 2. U.S. Navy 313-ship Plan**

Type/Class	Required	Description
Aircraft carriers	11	Transitions to CVN 21-class nuclear-powered aircraft carriers
Ballistic missile submarines	14	Comprised of 14 <i>Ohio</i> -class nuclear-powered SSBNs
Cruise missile submarines	4	Comprised of 4 <i>Ohio</i> -class SSBNs converted to SSGNs
Attack submarines	48	Comprised of nuclear-powered <i>Los Angeles</i> -, <i>Seawolf</i> -, and <i>Virginia</i> -class SSNs
Surface combatants	88	Includes 19 guided missile cruisers (CG[X]s), 7 destroyers (DDG-1000s), and 62 guided missile destroyers (DDGs and DDG[X]s)
Littoral combat ships	55	Sea frames only; program also includes 64 antisurface, antisubmarine, and countermine mission packages
Amphibious warfare ships	31	Includes 9 amphibious assault ships (LHD/LHAs), 10 amphibious transport docks (LPD-17s), 12 dock landing ships (LSDs)
Maritime prepositioned force (future)	12	3 modified LHDs/LHAs, 3 large medium speed RO/RO ships (LMSRs), 3 dry cargo/ammunition ships (T-AKEs), and 3 mobile landing platforms (MLPs)
Combat logistics force	30	Transitions to 4 Fast Combat Support ships (T-AOEs), 11 dry cargo/ammunition ships (T-AKEs), and 15 underway replenishment oilers (T-AOs)
Support vessels	20	Includes 2 command ships (LCCs), 2 submarine tenders (ASs), 4 rescue and salvage ships (ARs), 4 fleet tugs (T-ATFs), 4 ocean surveillance ships (T-AGOS), 1 high-speed ship (HSS), 3 Joint High Speed Vessels (JHSVs)

The Navy's plans to recapitalize its extensive carrier-based and land-based air forces are similarly challenged. In addition to the F/A-18E/F strike fighters now in production, the Navy must pay for carrier and STOVL versions of the new F-35 Joint Strike Fighter; the E/A-18G electronic attack aircraft; the E-2D airborne early warning aircraft; the P-8A Multimission Maritime Aircraft; the MH-60R and MH-60S shipboard helicopters; and the Broad Area Maritime Surveillance and Firescout unmanned aerial systems. In addition, the Navy must pay for the recapitalization of the Marine Corps' substantial rotary-wing fleet. The steadily growing costs for all these aircraft will continue to put enormous pressure on a Service top line that is already under great strain.

Moreover, it is not yet clear that the Navy's plans are consistent with the emerging competitive environment, which is defined by the ongoing struggle against violent radical Islamist extremists and their terrorist networks, the rise of authoritarian capitalist states, and the prospect of a world in which weapons of mass destruction, especially nuclear weapons, are widely proliferated.<sup>17</sup> In addition, the Navy is witnessing a dramatic expansion in the land, air, and naval power of the People's Republic of China (PRC). At present, the aim of this expansion is to prevent Taiwan from declaring independence. As part of its

planning, the PRC must hedge against the possibility of the United States intervening on the side of Taiwan. Accordingly, the PRC is developing a range of capabilities designed to contest U.S. air and naval operations up to 1,600 nautical miles from the Chinese mainland.<sup>18</sup> Foreshadowing the challenges and complexities of naval network warfare, these Chinese capabilities include an over-the-horizon, intelligence, surveillance, reconnaissance, and targeting network; maritime strike aircraft armed with advanced anti-ship cruise missiles (ASCMs); modern ASCM-armed surface combatants; and a qualitatively improved submarine fleet armed with advanced torpedoes and submerged-launched ASCMs. In addition, the PRC is experimenting with land-mobile, maneuverable reentry vehicle-equipped antiship ballistic missiles (essentially coastal artillery with ranges out to 2,500 kilometers), against which U.S. ships may have little defense.<sup>19</sup> This raises an open question: will rapidly improving Chinese maritime anti-access capabilities soon create a broad surface ship "keep out zone" in the far western reaches of the Pacific, and if so, how will the Navy respond?

There may also be a similar ongoing competitive shift in undersea warfare. New undersea target sets such as fiber optic cables and offshore energy platforms may spark new undersea combat missions. Extremely quiet, diesel-electric submarines with air independent propulsion can now patrol for weeks without having to recharge their batteries. Future undersea warfare will involve new types of combat networks composed of sensors, large and small manned submarines, and unmanned underwater vehicles (UUVs) and systems. Because the U.S. ability to project power globally rests on an assumption of continued undersea superiority, the Navy must make sure it is prepared for these changes and that it remains the top competitor when, and if, a major competitive shift occurs.<sup>20</sup>

Based on this quick survey, there are various possible changes to current Navy plans. These changes are shaped by the following assumptions:

- The Navy can exploit its current comfortable lead in aggregate naval power by determining the direction of the future naval competition before making any dramatic changes to its force structure.
- Operationally, the Navy must concentrate on improving its ability for forward engagement with smaller navies, fighting hybrid naval adversaries, and supporting U.S. irregular warfare in the near term. Over the long term, it should concentrate on



U.S. Navy (Rebecca Rebarich)

USS Wyoming, one of several Ohio-class ballistic missile submarines, was designed for Cold War nuclear deterrence but could be refitted for other roles

strengthening its undersea warfighting capabilities and improving the surface fleet's ability to fight from longer range—from beyond the densest defenses along a hostile coast.

■ To strengthen its long-term competitiveness, the Navy must reduce shipbuilding costs, husband resources, sustain the country's naval design and industrial base, and invest in robust research and development.

■ The four best ways to reduce shipbuilding costs and conserve resources are to exploit ship and aircraft designs now in production to the fullest extent possible in order to benefit from learning curve efficiencies; reduce the total number of different ship types to accrue savings in training, maintenance, and logistics; reduce crew sizes, which are the largest driver of a ship's lifecycle costs; and aggressively pursue improved networking capabilities, which provide added combat power well beyond mere numbers of platforms.

Based on these assumptions, the Navy should consider making the following changes to its current plans (see table 2).<sup>21</sup>

*Aircraft Carriers.* Reduce the carrier force target from 11 to 10 carriers, and shift to a sustained building rate of 1 new carrier every 5 years. At the same time, accelerate the development of a new carrier-based, stealthy, air-refuelable unmanned combat air system (UCAS). The UCAS has the potential to convert the aircraft carrier into a global surveillance-strike system able to fight from long ranges and against the most advanced air defense systems. Because the carrier force will continue to have 11 or 12 carriers through the mid-2030s, the Navy should consider converting one or two into UCAS carriers.<sup>22</sup>

*Ballistic Missile Submarines.* After completing the ongoing midlife refueling cycle for the first 12 of 14 *Ohio*-class nuclear-powered ballistic missile submarines (SSBNs), reduce the strategic deterrent fleet to 12 boats. This will free up two additional *Ohios* for conversion into nuclear-powered cruise missile and special operations transport submarines (SSGNs) and UUV motherships.<sup>23</sup> The Navy should also begin a concerted effort to design the future SSBN replacement, which will begin replacing the *Ohios* in the mid-2020s, presumably based around a new seabased strategic ballistic missile.

*Cruise Missile and Attack Submarines.* Forty-eight nuclear-powered attack submarines (SSNs) and 6 SSGNs are a reasonable interim target for the tactical submarine fleet; the ultimate size and character of

the future force will depend entirely on the future undersea competition. The most important requirement is to hedge against a major future undersea warfare challenge by maintaining an industrial base able to build a minimum of two boats per year, sustaining the submarine design base, and continuing a robust undersea warfare research and development program. Accordingly, the Navy should move to two *Virginia*-class SSNs per year as soon as practical, begin designing small manned submarines and UUVs that can perform both Naval Special Warfare and undersea combat network missions, and launch an aggressive undersea warfare experimentation program.

*Surface Combatants.* As indicated by the Navy's recent decision to truncate the DDG-1000 program to three ships and to restart the Arleigh Burke DDG production line, the Navy's current plan to recapitalize its large surface combatant force is simply too expensive for future shipbuilding budgets. The most important near-term goal is to execute a thorough hull and combat systems upgrade for the 84 guided-missile cruisers and destroyers either in the fleet or being built, to ensure their continued effectiveness. To save costs, the replacement programs for these ships—the CG(X) and DDG(X) programs—should be merged into a single Large Battle Network Combatant program. The new modular ship would be

U.S. Air Force (John M. Foster)



Stryker combat vehicles on patrol, Mosul, Iraq

sized for the cruiser mission, have a 40-year design life, and be affordable enough for a sustained ship-building rate of two per year. To maintain the industrial base until the new ship is ready for production, the Navy would continue building the Burke DDGs. Seven would replace the oldest CGs, which cannot be affordably modernized. After that, the Navy would maintain the size of the legacy cruiser and destroyer force at the current target of 88 ships. The long-term goal would be to replace these 88 ships with 80 new Large Battle Network Combatants.<sup>24</sup>

*Littoral Combat Ships.* The Navy plans to build 55 modular LCSs. Designed as multipurpose battle network combatants, the ships can be configured to perform antisurface, antisubmarine, and counter-mine duties. The Navy plans to build the ships at a rate of up to six per year, and then stop construction for a decade or more. To sustain the industrial base, a better plan is to build LCSs at a sustained rate of four per year. Once the Navy hits its objective target of 55 ships, it has two options: continue to build four ships per year to expand the size of the LCS force, or continue to build four ships per year, replace the four oldest LCSs on a one-for-one-basis, and transfer or sell the excess LCSs to friendly navies. Many small navies seek less complicated and expensive former U.S. warships. Refurbished LCSs would be a good fit for them. Additionally, the Navy should develop additional LCS mission packages to perform additional missions, such as Naval Special Warfare support.

*Naval Maneuver Ships.* Amphibious warfare ships are perfectly suited for a strategy that emphasizes sustained forward presence and engagement; Maritime Pre-positioning Force (MPF) ships are less so. Accordingly, the Navy should build a force of 33 amphibious ships (11 assault [LHD]/general purpose [LHA], 11 transport dock [LPD-17], and 11 dock landing [LSD]); cancel the proposed MPF (Future) squadron; and retain three legacy MPF squadrons. However, the Navy should build three planned Mobile Landing Platforms, assigning one to each legacy MPF squadron. This ship mix could lift a total of five Marine Expeditionary Brigades. The Navy should also build four additional LHAs to serve as escort carriers (CVEs), with Marine STOVL aircraft aboard, to further distribute fleet aviation capability. To save money, the Navy should replace the LSD force with a variant of the LPD-17 hull now in production.

*CLF and Support Ships.* The Navy should build 13 large, dry cargo/ammunition ships (T-AKEs), and then build 15 oilers and four Fast Combat Support ships based on variations of the same hull. This would

produce a 31-ship CLF fleet with a common hull, which would result in significant savings. Similarly, it should replace its two command ships and two submarine tenders with variations of the LPD-17 hull. The Navy now plans to maintain five ocean surveillance ships, forego building the High Speed Ship, and increase its Joint High Speed Vessel (JHSV) buy to seven ships. These are flexible, inexpensive ships that can serve a variety of engagement and fleet support tasks. The Navy should build a minimum of 5 more for general fleet support, for a total of 12, with 7 dedicated to maritime security duties (see below).

*Maritime Security Force Ships.* The 313-ship fleet was developed before *A Cooperative Strategy for 21<sup>st</sup> Century Seapower* was published. The strategy emphasizes persistent presence, maritime security operations, and partnership building capacity. Consistent with this strategy, the Navy should establish seven Global Fleet Stations, each with a command ship (a converted LSD operated by the Military Sealift Command);<sup>25</sup> one Maritime Security Cutter, operated by the Naval Reserve;<sup>26</sup> one JHSV; one riverine squadron; and four Coastal Patrol ships.

For those counting, these recommendations result in a battle force of 357 ships (see table 1). This does not count ships in the Military Sealift Command's prepositioning and sealift fleets, Coast Guard cutters, or other important deployable naval capabilities, such as riverine squadrons. Between now and 2020, the Navy would need to spend approximately \$21 billion each year to implement these recommendations. This is about \$6 billion less per year than the Congressional Budget Office's estimate for the Navy's FY09 30-year plan to build a 313-ship fleet.

As one can see, these recommended changes lead to less of a radical alternate naval force structure than an alternate competitive strategy for enduring naval superiority. This strategy improves the Navy's ability to engage forward in the near term and prepares it for stiffer challenges in the longer term. It does this by husbanding resources; exploiting the hulls currently in production; reducing ship crews; preserving the naval industrial and design bases; maintaining U.S. undersea superiority; and making sure that future carrier battle forces can fight from longer ranges.

### The Marines: From a Force in Readiness to a Force Engaged

This evaluation of the readiness and status of the Marine Corps has three components: winning the current conflict, equipping and modernizing, and posturing the Service for the future.

*Winning the Current Fight*

The Marines have made material contributions to every major campaign since September 11, 2001. They view Iraq and Afghanistan as part of the generational struggle, and have taken many training, doctrine, and educational initiatives to enhance the ability to prevail in the long war. Some 200,000 members of the Marine Corps have served in Southwest Asia since 2003. Another 49,877 Reservists have been activated since 2001 and 8,142 are deployed today, which represents about 20 percent of the Reserve Component.

The Marine Corps was engaged in Operation *Enduring Freedom* in Afghanistan during 2002, where Task Force 158 operated some 600 miles away from its amphibious shipping and logistics support. Several transition teams also have assisted the Afghan army. To counter the growing Taliban influence, some 3,000 members of the Marine Corps returned to that country in 2008 to engage in aggressive operations in Helmand Province to limit the ability of insurgents to intimidate the Afghan population and undermine the authority of the legitimate government.

The Marines deployed more than 50,000 personnel for Operation *Iraqi Freedom* in 2003, and some 24,000 remained in Iraq over last year. They demonstrated versatility by conducting major operations in Fallujah against foreign fighters and al Qaeda. After that intense urban fighting, the Marines transitioned to stability operations and support of the Iraqi government. They also provided additional battalions and support for the surge in 2007. Operating as part of the larger MAGTF, they performed with agility and demonstrated a wide range of capabilities that negated efforts by the insurgents and supported the Sunni awakening in Al Anbar.

Moreover, the Marine Corps has deployed some 25 training teams in the area of operations of U.S. Central Command, and some 600 Marines in two dozen countries as trainers and advisors. In addition, it executed more than 50 theater engagement events in the past year, including events in Iraq, Central America, the Middle East, and Africa. It also trained more than 400 foreign officers in various Marine Corps educational institutions and programs located in the United States.

In addition to combat operations in distant theaters, the Marine Corps budget has grown to increase its authorized strength from 175,000 to 202,000 by FY11. The commandant insisted on plans to develop all elements of the MAGTF in a balanced manner to meet the challenges of an uncertain future. The additional

forces will allow the Service to have sufficient forces to conduct ongoing operations, train new forces for overseas missions, and remain capable of fulfilling both its core competencies and Title 10 responsibilities.

Achieving recruiting, equipment, and construction objectives will cost more than \$30 billion over the Future Years Defense Program. Additional end-strength will result in three Marine Expeditionary Forces—balanced in both their capacity and capability. This increase will enable ongoing support to combatant commanders as well as reduce the unsustainable tempo of deployments on Marine personnel.

The increase permitted the addition of three infantry battalions and the equivalent of an artillery and military police battalion, enhanced armor and combat engineer battalions, and air-naval gunfire liaison companies. Current plans call for more logistics units and light attack helicopters. Moreover, the Marines intend to improve the deployment-to-dwell ratio by reducing operating tempo of various units, including military police, UAVs, helicopter, air command and control, combat service support, and explosive ordnance disposal.

Force expansion is being successfully executed. The Marines surpassed the FY08 authorized end-strength objective of 189,000 and also preserved force quality with recruits who have a high school graduation rate of more than 94 percent. The Service also expects to reach its expansion goal ahead of schedule in 2010. The Obama administration must gauge the strategic environment, the likely nature of future conflict, and available resources to determine if this force expansion meets the long-term needs of the Nation. For now, it is apparent that American ground forces have been badly strained by two simultaneous long-term counterinsurgency campaigns.

*Equipping and Modernizing*

To maintain the current high operating tempo, the budget of the Marine Corps has been substantially increased since the peace dividend of the 1990s. The baseline budget that pays largely for manpower, operations, maintenance, and procurement of ground weapons has increased by 100 percent since FY00 (in current dollars). The Marines also have benefited from substantial funding in Navy accounts, which is known as blue-in-support-of-green funding that provides for aviation. These funds are critical to the Marine Aviation Plan, which will transition more than half of the Marine aviation resources (39 out of

71 squadrons) from 13 legacy types of aircraft to 6 new aircraft models and one unmanned system.

The Expeditionary Fighting Vehicle is designed for operations conducted from the sea and in littoral regions. Although often construed as a niche capability, it has inherent capabilities that provide utility across the conflict spectrum, including riverine and urban operations. The vehicle offers amphibious mobility, cross-country versatility, lethality, enhanced force protection, and communications that will improve joint force operations. This is the largest acquisition program in the Marine Corps, and it has been beset by technical complexities and rising costs. The decision was made to limit the program objective to 574 vehicles in order to invest in a flexible suite of ground vehicles. Although this program survived the last Quadrennial Defense Review (QDR), it will once again be examined for relevance, cost level, and program management challenges.

The F-35B STOVL aircraft is a variant of the JSF that offers basing flexibility and timely support across the full spectrum of warfare. JSF capabilities will integrate combat systems in support of ground forces and be the centerpiece of Marine aviation. Production of the first 19 test aircraft is currently under way. Reflecting the Service's expeditionary orientation, the Marines are committed to an all-STOVL tactical aircraft force, which enables MAGTFs to operate close to supported units under austere conditions.

MV-22 Osprey aircraft are replacing 40-year-old CH-46E helicopters that were introduced during the Vietnam War. The Marines have received 60 aircraft, which are based at Marine Corps Air Station New River, North Carolina; Patuxent River, Maryland; and Al Asad Air Base, Iraq. Ospreys make up one training squadron, one test squadron, and three tactical squadrons. The Marines will transition two CH-46E squadrons to MV-22 squadrons per year through 2012. An Osprey squadron was deployed to Iraq in 2008, and the capabilities of this aircraft have been proven under combat conditions. The range, speed, and durability of the hybrid tilt-rotor aircraft have been ably demonstrated. The MV-22 squadron in Iraq executed operational missions in 6 hours that would have taken some 12 hours in the more vulnerable CH-46 helicopters.

#### *Posture the Service for the Future*

The commandant of the Marine Corps has stated that "it is our obligation to subsequent generations of Marines, and to our Nation, to always have an eye to the future—to prepare for tomorrow's challenges to-

day." To further that obligation, he created a task force to produce a new vision and supporting strategy. The vision provides a foundation for operational concepts and identifies the critical steps needed to shape the Service for an increasingly volatile and uncertain future. It is grounded in its role as the Nation's force in readiness, but will guide combat development in the long term to properly organize, train, equip, and prepare the Marine Corps for tomorrow's challenges.

The commandant describes the Marine of tomorrow as a two-fisted fighter capable of destroying enemy formations with flexible air-ground-logistics teams in major contingencies, but equally capable of employing hard-earned irregular warfare skills honed over decades of conflict. The Marine Corps envisions itself as a persistently engaged and multi-capable force, drawing on the Total Force to address the full range of contingencies that the future will present.

The Marines aim to become the Nation's expeditionary force of choice. The commandant and his leadership team are committed to maintaining a Marine Corps ready to live hard in uncertain, chaotic, and austere environments with an expeditionary mindset—emphasizing speed of execution, agility, and flexibility. Accordingly, the Service must be lean, agile, and adaptable. Over the last decade, the force has gotten much heavier. A balance must be struck between being heavy enough for expeditionary warfare and light enough for rapid deployment overseas aboard naval ships. Getting lighter will not negatively impact organic sustainability. The vision ensures that the Marines of tomorrow maintain the ability to sustain themselves in operations through the use of a seabase or initial lodgment ashore. The organic sustainability of MAGTFs is a unique and critical force enabler in such conditions, particularly early in an operation.

The vision devotes more attention and resources to education and training for understanding and defeating potential adversaries in complex conflicts involving combat and stability missions. The ability to conduct both types of operations simultaneously represents the essence of that two-fisted fighter—offering a hand to people in need or delivering a precise jab in irregular warfare while wielding a closed fist in major combat operations. The Marine Corps strives to be as effective in counterinsurgencies as it has been in kicking down doors as part of its amphibious operations.

Current operations in Iraq, Afghanistan, and the Pacific basin illustrate the range of operations

the Marines must be prepared to conduct in the future. This challenge is nothing new and should not unsettle anyone who understands the history of the Marine Corps or the well-honed crisis response toolkit that the Marines provide worldwide to combatant commanders.

The Nation needs a force in readiness to rapidly and decisively deploy to crises anywhere in the world. But the emerging environment requires the Marines to shift from a “force in readiness” to one that is more engaged and proactive. To do so, the Marine Corps will train, advise, and shape events more directly. Marines should not simply be deployed forward; they should be actively engaged forward supporting theater security plans while also being prepared to conduct complex expeditionary operations. These challenges will require the Service to make changes and adapt to new skill sets. But regardless of resources, the Marines will continue to perform well just as they have done throughout American history.

### Critical Decisions for the Air Force

Military strength underpins American diplomacy and its role in the world. The men and women of the Air Force are integral to that strength, standing watch in missile fields and at bases in both Korea and Japan, while serving with distinction in Iraq, Afghanistan, and wherever duty calls. In war and

peace, their mission in air, space, and cyberspace as part of joint and coalition forces provides the United States with the capabilities required to project power globally.

Today, the Air Force faces several critical questions. Under new leadership, the Service must address nuclear discipline following two high-profile mishaps. During the 1990s, after Strategic Air Command was dissolved and the conventional role of nuclear bombers was increased, some of that discipline began to erode in the Air Force. In an age of nuclear-armed countries, nuclear weapons remain the ultimate guarantor of U.S. national security, but the organization that the Air Force uses to manage those weapons is no longer up to this critical task.

The Air Force also faces major acquisition problems, which are similar to those confronting other Services but of greater magnitude. As a general rule, the Service is dependent on big-ticket space and air platforms that require decades-long development lead times and remain in the force for decades. Most bombers and tankers flown today were built when General Curtis LeMay led the Air Force, and most fighters were built in the 1970s and 1980s. Added to this problem, after 18 years of maintaining a high operating tempo, including combat sorties and airlift operations to support combat in Southwest Asia, equipment has aged more rapidly than originally anticipated. Recent questions raised by the Government



U.S. Marine Corps (Cherie A. Thurby)

Marine speaks to villager through translator during civil-military operations training at Marine Base Quantico

Accountability Office about the acquisition process in the Air Force have complicated and postponed recapitalization efforts. Given smaller budgets and a highly charged atmosphere surrounding acquisition matters, solving the recapitalization problem will not be easy but must be tackled under new leadership.

The Air Force also faces serious challenges in regard to its cyber mission. Although analysts increasingly agree that such capabilities will be at the core of conventional and unconventional warfare in the future, budgets do not reflect this priority for any Service. As the Air Force has moved to increase cyber capabilities, the Department of Defense (DOD) has struggled with issues of allocating responsibility for cyber security and warfare among the Services and various agencies. Because it provides 80 percent of land and space command and control infrastructure protection to the Nation, the Air Force is in a position to take the lead in this mission.

Finally, the Air Force faces strategic questions on the allocation of limited resources between unconventional and conventional warfare. Over the next decade, advanced surface-to-air missiles and fourth-generation fighters will be transferred by Russia and China to potentially hostile states. Ensuring the air superiority required to project power globally, and even to utilize UAVs and air-to-ground strike platforms for unconventional warfare, the Air Force must purchase expensive fifth-generation fighters and stealthy long-range bombers. However, doing so will diminish the resources available for assets to support the conduct of current unconventional warfare operations. Squaring this circle will not be easy.

The Air Force is consolidating its nuclear forces under a single command and transforming its procurement system from requirements to acquisition. Moreover, the Service has given cyber assets to the 24<sup>th</sup> Air Force and, with the Army, Navy, and Intelligence Community, is developing related tactical and strategic efforts at Nellis Air Force Base. Yet budget questions loom large. Given ongoing operations, there is no peace dividend to bank. After a global financial crisis, very large projected deficits, and little in long-range budgets to cover inflation, the Air Force will have to set priorities and make hard decisions.

#### *Fighter Modernization*

Along with naval combat assets, Air Force combat aircraft form the basis of U.S. power projection capability. This force is evolving with fifth-generation fighters and next-generation bombers that will replace aging planes. This evolution is important

because legacy aircraft and ships are slowly losing the ability to operate against antiaccess technologies. Within the next 10 to 20 years, credible military diplomacy among major powers, and military operations against states capable of buying new Russian and Chinese missiles and aircraft, will require aircraft capable of operating in a high-threat environment. Practically speaking, the Air Force must increase its inventory of fifth-generation fighters as well as develop a new bomber.

As of August 2009, the question of the size of the fifth-generation aircraft appeared to be resolved. The Obama administration decided to end production of the F-22 jet fighter at 187 planes rather than a projected inventory of 243 aircraft as planned in the previous administration. Although some Members of Congress and others continue to support the F-22 program, which began as a response to Soviet aircraft developments in the 1980s, the administration decided to cap the program in order to fund higher priorities. The limited number may make moot the issue of whether the F-22 would ever be sold to allies.

The Air Force must take three steps to develop a successful fighter program. First, it must develop a coordinated acquisition process tied to strategic requirements. In particular, the process requires more focus on the F-35 aircraft. Out-year schedule changes and budget adjustments have made the F-35 program a bill-payer for other acquisitions, which must stop. Second, the JSF program must fully engage those allies investing in program technology. Artificial barriers preventing key partners from fully participating must be dropped. Finally, interoperability of the JSF with allies—equipment, training, information, and combat employment—is the heart of the program and needs top-level attention. Moreover, like fighters, bombers are aging rapidly. The last B-52H came off the production line in 1962. A substantial portion of the fleet is grounded. If the United States intends to maintain the ability to conduct a long-range strike mission, it should continue investment in such aircraft.

#### *Intelligence, Surveillance, and Reconnaissance*

While speaking at Maxwell Air Force Base in April 2008, Secretary Gates drew on his experience in the Intelligence Community to challenge the military Services to examine their cultures in order to accomplish future missions. Calling on the tradition of innovation of earlier Air Force thinkers, Secretary Gates urged his audience to consider if the ways in which the military does business continue to make sense.

Nowhere is such thinking more apropos than intelligence, surveillance, and reconnaissance (ISR). The revolution in information technologies, combined with the accuracy of global positioning satellites used for navigation, has introduced highly sophisticated approaches to the application of modern airpower. But the ability to strike targets with precision became limited by the ability to find and identify them, particularly in distinguishing combatants from civilians.

Some of the most critical ISR-related issues the Air Force must address relate to UAVs. Questions continue about balancing the need for persistent ISR capabilities with assets that can survive on the battlefield. If programmers continue to believe that future airspace will be uncontested, they must shift the balance toward vulnerable yet persistent unmanned assets at the expense of more survivable ones in setting their budget priorities. Otherwise, they should give survivability greater weight. The Air Force must develop systems that communicate with ground forces and effectively allocate ISR across continents. Equally important, it must develop methods of cultivating mutual trust and support among Soldiers and Airmen to maximize the effectiveness of Air Force assets. Furthermore, because ISR capabilities involve assembling a cohesive picture with data drawn from multiple domains, the Air Force must increase its ability to process as well as obtain information. Beyond such considerations, the Air Force must seek to improve ISR development in light of the recommendations reported by the Allard Commission in 2008 that indicated the National Reconnaissance Office requires major restructuring.

As new technology has become available, the Air Force has been partnered with commanders on the ground. Over the last 3 years, as ground forces have discovered the value of the Rover platform and other ISR capabilities, requests for persistent surveillance have outstripped assets by levels of magnitude. As joint confidence in ISR as well as guided precision strike grew during the surge in 2007, joint commanders increased the total daily average weight of ordnance dropped by the Air Force in Iraq by more than 1,000 percent. The future demands are likely to be even greater as these capabilities mature and expand.

As the U.S. military learns to utilize ISR-based capabilities, the enemy is also adapting. Increasingly, this problem dominates the news as the enemy seeks to deny precision attack bomb damage with misinformation. Finding targets has become more

difficult than striking them. How the joint team deals with this problem will affect the benefit of airpower in future insurgencies. The continuing improvement in ISR assets will require fostering synergism among institutions, people, and technology in the air, space, and cyberspace. It will also mean improving the speed of total feedback and addressing the ability of potential enemies to operate inside a friendly observe-orient-decide-act cycle or the so-called OODA loop. DOD will look to the Air Force to take the lead in finding ISR operational solutions.

Airlift, tankers, and search and rescue platforms that provide logistical support in war are often as important as combat forces. Along with supply ships, airlift plays an important role, not only in supplying war, but also in providing humanitarian relief. The air bridge between Kuwait and Iraq has saved countless lives by delivering supplies without Soldiers having to run the gauntlet of improvised explosive devices, but it has resulted in the premature aging of transport aircraft. Humanitarian airlifts after the Asian tsunami, Pakistani earthquake, Russian attack on Georgia, and natural disasters in the United States have taken a heavy toll on aircraft longevity.

Recapitalizing airlift, tankers, and search and rescue assets has been deferred for many years. In the next 4 years, the Air Force must begin work on combat search and rescue platforms and new tankers. Expanding the airlift capacity will be a fiscal challenge. U.S. Africa Command by itself will demand significant airlift resources to accomplish its interagency mission. In terms of national security priorities, airlift is a capability that joint and coalition operations depend on. The Air Force will be required to identify additional fiscal resources. Prioritizing the mission of the airlift fleet and finding the resources to support it will present a serious challenge.

### *Space and Cyberspace*

Like air assets, space assets are rapidly aging. In an age when states are testing antisatellite weapons, studies point to the increasing vulnerability of large unshielded multipurpose satellites and call for smaller, less costly, and more survivable replacements. With regard to cyberspace where the Air Force has responsibility for most cyber protection, and with defense assets constantly under attack, it is critical to develop an investment plan in this domain. Cyberspace acquisition is being studied in the Electronic Systems Division with support from the Air Force Research Laboratories and should be better framed in the next budget cycle.

*Forward Presence*

For the Air Force to project global power, it requires international bases to extend its reach and provide aerial refueling of shorter range fighters and transports. Besides projecting national power, basing agreements deter aggression by demonstrating the solidarity of the United States and its allies around the world. As a new generation of antiship missiles has continued to drive aircraft carriers farther from shore, basing will remain important to American defense interests. This requirement has not received the attention that it deserves; thus, basing issues and related power projection considerations must be given a high priority.

*People*

In recent years, the end-strength of the Air Force has been considerably reduced as missions have increased and its personnel reassigned to in-lieu-of taskings to bolster Army units, which has stressed the force. Resolving this problem will require increasing the size of the force, maximizing value and minimizing waste by streamlining under Air Force Smart Operations, and continuing the focus on quality of life issues. Given the amount of money being allocated to the development of technical skills, Airmen must be retained. Yet given budget pressures, doing so without sacrificing recapitalization or current operations represents a real challenge.

*Focus on Energy*

Since Jimmy Doolittle helped Shell Oil produce 100-octane aviation fuel in the 1930s, energy has been critical to Air Force research and development. With the price of oil fluctuating and the United States and other nations demanding lower carbon emission from jet fuel, this mission is more important than ever. The Air Force must increase efforts in this area to protect bases from grid interruption and facilitate the transition to alternative fuels in the future. The Air Force Research Laboratory has led the way through innovations that have been extended to commercial partners. The programs are inexpensive and provide a disproportionate return on the investment when the potential of energy security is also factored into the equation.

In the coming decade, the Air Force will face tough choices in rebuilding its nuclear program, defining its cyber mission, and allocating its tight budget across an aging inventory of space and air assets. Its capabilities underpin joint warfighting, from air superiority and aerial refueling to ISR and communications for modern warfare. The future will require hard deci-

sions on the role of the United States in the world and the configuration of the Armed Forces to support national objectives. The global military environment is changing. Policymakers must decide how to structure the Air Force to respond to those changes.

**Military Manpower and Personnel Issues**

The Armed Forces, particularly the Army, face challenges in both the recruitment and retention of sufficient personnel with requisite qualities. Some factors influencing these challenges—such as the extent of combat operations in Iraq—are likely to abate in the next few years. Others will become more salient. The basic paradigm for manning the force that has existed since the end of the draft in 1973, particularly obtaining recruits, soon may be untenable without major changes and infusions of money. The Obama administration also faces other manpower issues, notably adapting career personnel management to new operational and social realities, dealing with the high cost of military health care, and maintaining capable Reserve Components in an era of mobilization. However, these issues are secondary to finding enough recruits for the Active force.

The All-Volunteer Force instituted some 35 years ago has been extraordinarily successful in both peace and war. The average quality of recruits, both in quantifiable terms and intangibles of character, has been substantially higher than during conscription from 1940 to 1973. This enables the Services to train men and women to higher standards. Disciplinary problems are dramatically lower than during the draft. The higher quality of recruits, coupled with high levels of military compensation that guarantee living standards for career personnel at least equal to their civilian counterparts, has resulted in high-quality career noncommissioned officers. Coupled with force modernization and technological and attitudinal revolutions in unit training, these personnel have brought U.S. forces to a level of readiness unmatched in history. All of this has been seen on the battlefield in the last two decades. Nor are there operational indications that personnel readiness has flagged, almost 8 years after terrorist attacks on the United States, and after 6 years of grinding, repetitive, and frustrating combat operations conducted in Southwest Asia.

The number of new accessions and reenlistments was reduced with the All-Volunteer Force. Active strength was 2.2 million in 1973 and had dropped to only 1.4 million by the mid-1990s. The post-Vietnam Army of 780,000 had declined to 480,000 members on September 11, 2001. Not until the Nation was

into the Iraq conflict in 2005 did DOD, prodded by Congress, grudgingly consent to a modest increase in Army strength to 547,000 over several years.

The Army has maintained both officer and enlisted strength only by lowering enlistment standards in the last few years and by increasing enlistment, reenlistment, and retention bonuses and special pay. Some enlistment bonuses are figured in five figures and reenlistment bonuses in six. Studies indicate recruits with moral waivers do better by some standards and only slightly worse than other enlistees, while not compromising their overall battlefield performance.

Nonetheless, this state of affairs may not endure. The benefit of paying lump sums to recruit and retain personnel may have reached its useful limit. There has been a decline over the last 15 to 20 years in the propensity of young people to enter the Armed Forces, which not surprisingly has accelerated during the Iraq War. Under existing standards, only about 30 percent of 18-year-old men and women are eligible for military service, with the balance physically or morally unfit because of obesity, health issues, and drug use. More significantly, the rise in college attendance shrinks the pool of youth who have traditionally enlisted. The tendency of African-Americans to enlist has dropped over the past 20 years. This may pose issues for society in general, but it also has the effect of depriving the Services of a reliable manpower pool that formerly enlisted and tended to remain in the military for a career. Some problems may be directly related to Iraq and diminish when the conflict winds down. However, the war on terror and the struggle in Southwest Asia that may require a forward presence for many years suggest that recruitment and retention will take place in a wartime rather than peacetime environment for the foreseeable future.

Reports of an immediate crisis in officer retention, particularly a hemorrhaging of captains in the Army, have turned out to be overstated. However, retention is unquestionably under pressure that is likely to increase. The leadership and knowledge skills of junior officers, many of whom have been combat tested, have led to an unprecedented demand for them in the private sector. The constant transfers, combined with the exhausting pace of Iraq and Afghanistan deployments in both the Army and the Marine Corps, make it difficult for officers to put down roots, marry, and have families. Once married, frequent household moves make it difficult for spouses to establish and maintain their professional careers, which has

▼ *Continued on p. 403*

## Integration Initiatives in the Air Force

At a time of increasing competition for scarce resources, the integration of all components makes sense. While the Air Force has been integrating with varying degrees of success for more than 40 years through association constructs, and all components have worked together in combat contingencies for nearly two decades, fiscal imperatives are driving an accelerated rate of association today. It is critical that Airmen look beyond fiscal efficiency and grasp the magnitude of changes in aggressive force structure. Promoting association exclusively for fiscal efficiency risks compromising inherent component attributes and combat effectiveness. Moreover, there are still tough issues that must be resolved. Do association constructs work with operations plans? Do they increase the capability of the joint warfighter? How should they measure that?

Integration represents more than bringing people and equipment together. It means bringing organizations with different cultures together around common equipment and common missions. All organizations and associations are based on relationships that require understanding, respect, and appreciation of them to be successful. The Active Component of the Air Force provides well-trained, highly standardized, dedicated personnel; it comprises 65 percent of the Service. Regular Airmen are available 24 hours a day, 7 days a week, and are able to deploy on short notice for longer periods of time without risking their livelihood. They can move from one duty station to another with few complications. New duty stations and resulting changes in assignments provide these Airmen with a broad perspective on the Air Force and help develop leaders. On the other hand,

U.S. Air Force (EunIQUE Stevens)



Lt Gen Stenner meets with Active-duty, Reserve, and Guard Airmen in Kirkuk, Iraq

frequent moves can make continuity in any given unit mission far more difficult.

Like the Active Component, the U.S. Air Force Reserve and Air National Guard contain well-trained, highly standardized personnel. Most have served in the Active force and have more experience that benefits the younger Airman. They perform a number of the Air Force missions to include some that are not performed by the Active Component, such as aerial spray (Reserve), weather reconnaissance (Reserve), aerial fire fighting (Reserve and Guard), and aerial broadcast operations (Guard). Moreover, members of the Air National Guard perform state-focused, governor-directed missions such as counterdrug operations and disaster response.

Reservists and Guardsmen remain members of the Air Force because they enjoy the mission and are dedicated to the Nation. They strike a balance between commitments to the Service, their families, and their civilian jobs, which is the major source of their income. From their civilian jobs they bring skills, background, and creativity to the military, which are highly valued assets. These Airmen take great pride in their unit and ability to perform the mission. Most have long-term ties in their communities and states, and have little desire to move to another duty station. While this lack of mobility presents difficulties in developing leadership experience over careers, it provides long-term continuity to the unit mission and ultimately to the Air Force.

Members of the U.S. Air Force Reserve and Air National Guard train to the same standards and currencies as the Active duty force at a fraction of the cost. Most are capable of deploying in 72 hours of notification. However, they are not as accessible as their Active counterparts: short of being mobilized, the Reserve Components depend on volunteers to meet wartime taskings. The Reserve and Guard form a smaller percentage of the force (14 and 21 percent, respectively) and thus are less capable than the Active Component of sustaining a high operating tempo.

Such are the attributes of components; they make each unique and successful. The challenge is preserving the culture of each component, improving fiscal efficiency, and adding capabilities. After 40 years of trial and error, some basic truths about associations have emerged. Both the host and associate unit should have roughly mirror organizational structures in which each component unit retains a separate administrative chain of control so that promotions,

discipline, readiness, training, and so forth remain in the component of the unit. Authority to designate objectives, assign tasks, and provide operational direction to ensure unity of effort in the mission must be resolved by memoranda of agreement. The agreements should provide opportunities for units to develop leaders, not only in terms of administrative control but in operational direction as well.

Because the host unit remains primarily responsible for equipment, there is the potential for an uneven playing field. Moreover, not all missions are the same; some readily lend themselves to training. Equipment can influence how much training can be accomplished. Care should be taken to ensure parity in access to equipment in achieving unit training objectives.

Units must be able to retain their unique and separate identities, which are the source of pride for members of each component and can be the source of motivation in accomplishing missions. If unit identity is compromised, the motivation to perform the mission and serve will be as well. Beyond those basic tenets, associations present new challenges in developing plans to meet the needs of combatant commanders. Often it has been the case that plans were developed for units to deploy together with their equipment in support of a given operation. Associations must be worked into plans. Although progress has been made in developing mobilization plans that deploy equipment separately from units, difficulties will be encountered in executing them. It will be important to find the right mix of Active and Reserve Components when allocating people against missions in the Air and Space Expeditionary Force construct. Determining how long and how best to access Reserve Component personnel for that mix (that is, by mobilizing them or seeking volunteers) provides combatant commanders with the most effectively resourced force.

The Air Force must educate personnel on the unique challenges of associations—at all levels and among components. Advancement in each Service today is premised on joint education and experience. However, it should also be premised on joint component education and experience. Candidates for leadership in associations should be screened and selected based on their ability to get along with other components. Force integration should not be seen as a separate process in and of itself. Properly understood, it is a unified, harmonious, and effective entity.

▲ *Continued from p. 401*

become the norm for a large number of people with college or postgraduate degrees from which most of the officer corps is drawn.

While the existing recruiting model may have outlived its usefulness, the Services probably will continue using it with only marginal adjustments. But other approaches are available. One change would be assigning the same budget priority to recruitment as weapons procurement. The Services spend billions on hardware, but then nickel and dime recruitment in relative terms. The All-Volunteer Force has afforded a good military for the money. Added resources, though, may be needed in the future. Pursuing college-bound youth with educational benefits or paying off student loans of college graduates makes sense. Arguments that educational benefits induce people to leave the military are false. Moreover, recruits should be more carefully selected since about one-third of first-term enlistees do not finish their first term. Rigorous, albeit expensive, drug tests would eliminate some recruits and may deter others from using. The physical fitness standards applied to recruits in meeting training quotas are also problematic. Requiring several more weeks of training makes greater sense than allowing recruits to go on unit assignments only to be separated before completing their first-term enlistment for medical reasons.

The Services should find ways to acquaint young people with military life. Recruiters face *unmilitary* rather than *antimilitary* attitudes. The option of military service does not dawn on many Americans. While the Pentagon begrudges spending money on the Junior Reserve Officer Training Corps, it does produce a large number of recruits. Moreover, the Services should consider experimenting with programs that enable young people to serve for a few months in the military, similar to the Citizens Military Training Camps operated during the interwar period.

Finally, the President will be subject to enormous pressure to support the admission of admitted homosexuals to the military. This issue reflects a wider debate in society over according full rights to gay men and women. Those who favor ending the statutory ban on gays argue that changed social mores have removed the stigma of homosexuality, and various surveys of military personnel support the admission of gays, plus impressionistic comments by junior and senior officers. If this is the case, it undercuts arguments that openly gay personnel in the ranks negatively affect cohesion and discipline, and buttresses the view that the military, particularly

given a strained recruiting environment, cannot afford to lose the service of capable individuals who happen to be gay or lesbian Americans, although this may be an oversimplification.

Many enlisted personnel are prepared to live and let live with regard to homosexuals who are not out of the closet, but are less well disposed to openly gay men and women. One of the dominant motivations for enlisting in the combat arms is the testing and proving of masculinity, which in the minds of many young men is contradicted by open male homosexuality. Polls and surveys, even those conducted anonymously, may reflect subliminal attempts to conform to popular views rather than actual beliefs, a phenomenon familiar to sophisticated designers of survey research. In addition, there has been virtually no mention of the effect of ending the ban on gays on those who influence potential recruits, principally their parents. These factors suggest that the debate over gays in the military has been framed in a rather limited and restrictive manner.

### Defense Budgets: Past and Future

There are a number of critical national security issues that face the Obama administration. The conflicts in Iraq and Afghanistan, rising regional powers, and the ongoing fight to dampen the influence of al Qaeda are daunting tasks. But the most challenging issue may be the badly strained Pentagon fiscal accounts. In the 1990s, defense spending was squeezed to gain a modest peace dividend. Critics predicted a train wreck in military effectiveness as procurement was scaled back. Today, analysts refer to the Pentagon coffers as a poisoned chalice. Stretched by two conflicts in Southwest Asia, these accounts compete within a Federal budget that is increasingly plagued by a weak economic base, changing demographic realities, and ever growing entitlement programs. Resolving such deficiencies, in the midst of ongoing wars, will demand rigorous planning that acknowledges the risk of an overstretched force and judiciously matches ends and means.

The 'war on terror' has resulted in significant increases in the defense budget. Spending in real terms is 30 percent higher today than in 2001, not including funding for the operations in Southwest Asia. At the same time, fiscal constraints have resulted in deferred modernization of the Services. Moreover, higher usage rates of aircraft, vehicles, and weapons increase the cost of resetting the force to previous levels. Supplemental budgets have absorbed the brunt of the reset, but estimates indicate

the need for \$100 billion to \$200 billion in deferred maintenance and repair costs. In addition, the delayed modernization of the Navy and Air Force represents another \$200 billion. Filling this gap would increase the defense budget on the order of some 10 to 20 percent.

Beyond qualitative changes in the character of the Armed Forces, there are planned increases in the strengths of the Army and Marine Corps. The Army is authorized to grow by 65,000 to 547,000 and the Marines by 27,000 to 202,000 by FY11. This decision represents a modification to force development guidance that had previously emphasized leap-ahead technology and standoff warfare. Irregular threats in dense urban environments or among “the people” do not present readily identifiable target sets. The combined estimate for these manpower rampup costs comes to almost \$108 billion in the FY08 to FY12 period, and \$12 billion per year after.

Gauging defense requirements has never been easy. The proverbial question “How much is enough?” has never been satisfactorily answered. U.S. military spending is almost equal to that of the rest of the world combined, or about 47 percent of global defense budgets. The United States spends more on defense than the next 16 nations combined.

As guarantor of international stability, with a range of global interests to protect, it should not be surprising that the U.S. defense budget is the largest. But it begs a key question: why has the Pentagon been unable to provide a sufficient margin of security given that its spending outclasses any rival or com-

bination of rivals by several orders of magnitude? Ultimately, it is a question of how much we can afford and how much potential risk policymakers are willing to accept.

The question “How much is enough?” has been sidestepped by claims that the United States is simply not spending enough. This reasoning rests on arguments comparing past conflicts such as World War II, Korea, and Vietnam to current budget authorizations. Using these comparisons, some argue that the United States is spending far less than in the past and that defense spending has reached an all-time low. These historical comparisons are worthy of a bit of scrutiny. First, historical patterns may not provide a valid basis for comparison, including the Cold War period when a monolithic adversary posed both ideological and existential threats backed by thousands of nuclear warheads as well as tens of thousands of tanks and aircraft. While al Qaeda presents a threat, it is not the same kind as the Soviet Union. Terrorists are committed, and should they acquire weapons of mass destruction, the results could be catastrophic. But the forces and resources needed to check that threat in no way approach levels of past wars.

Is America really spending less? We are spending less of the total Federal budget and less of the gross domestic product (GDP) on the military than in the past. But this does not equate to spending less on defense in terms of absolute resources.

A different story emerges when defense spending is examined in constant dollars adjusted for inflation in past conflicts. Defense budgets grew in both real and absolute terms continuously from 1966 to 2006. What the data fail to capture is the shift to the All-Volunteer Force and the ineluctably higher cost of advanced military technology. These factors are critical elements of our military strategy and the dominant status of our Armed Forces. Both also contribute to a military budget that dwarfs spending in other countries of the world. This is why looking at the defense budget as a percentage of GDP or a share of the Federal budget does not reveal much. In fact, it conceals more than it helps. Such indicators fail to capture growth in the overall economy or steady increases in the budget of the United States; the GDP is an indicator of neither requirements nor national strategy itself, but rather a crude measure of what the Nation can afford.

Defense spending has increased over time in real terms (adjusted for inflation). Although the Pentagon share of the Federal budget has declined, its real or absolute resources have increased. The total top line



U.S. Navy (Gary Ward)

Navy southwest region commander visits with Navy Junior Reserve Officer Training Corps students at Carl Hayden High School, Phoenix

has grown from \$452 billion to 589 billion in constant dollars. So arguments over declining defense budgets need to be clarified. In real terms, almost 30 percent more is being spent today than during the Cold War.

The idea that defense budgets have reached all-time lows is simply not true. America is actually spending more today, much more than other countries in the aggregate. Some increases can be explained by the All-Volunteer Force and rising energy and health care costs, while others support a global basing posture and overwhelming edge in space-based intelligence and warning systems. But a big picture suggests that we should be concerned about the future. The United States has numerous long-term liabilities. The defense share of the Federal budget has declined as entitlements have steadily grown. That share will grow with the retirement of Baby Boomers. The percent of the Federal budget allocated for defense has declined from 43 percent in the early years of the Vietnam War to 28 percent by 1986. Over the last 20 years, it has declined further to 20 percent of the budget, and it will continue to decline on the order of 15 percent by 2026. This will result in spending under 3 percent of GDP.

Demographics and resulting shifts in funding could limit the resources available for defense and make calls for greater military spending moot. Between now and 2030, the number of Americans aged 65 and over will double from 36 million to 72 million. Moreover, the Boomer generation will be roughly 20 percent of the population. Medicare and Medicaid costs will grow from 1 to 25 percent of all Federal spending between 1966 and 2026. Spending on three major entitlement programs consumed over \$1 trillion in 2006 or 40 percent of the Federal budget. By 2026, some 13 percent of the GDP and 47 percent of the Federal budget will go to entitlement programs if current trends are not addressed.

Funding increases for such programs pose profound implications for the ability of the Nation to provide for the common defense and other government responsibilities. It has been suggested that given these trends, the only public function left by 2040 will be to mail entitlement checks to pensioners. There will not be money left for anything else, including DOD. The long-term implications of these trends in the American polity could have severe implications for policymakers sooner than anticipated and may contribute to a future perfect storm.

Some national security experts and Members of

Congress have called for imposing a floor on defense spending at 4 percent of GDP. The Secretary of Defense and Chairman of the Joint Chiefs of Staff have endorsed such proposals. Today, the Pentagon absorbs nearly 3.7 percent of a \$13-trillion-plus economy. The funding currently provided under supplementary requests increases the percentage to roughly 4.2 percent. Given an annual defense budget of over half a trillion dollars, establishing a fixed level of spending would create a stable basis for planning. However, this assumes that the U.S. economy grows and that costs of inflation, personnel, and energy do not erode the added resources. While a 4-percent GDP objective appears reasonable, decisions on making defense investments are going to be difficult to resolve among these many competing demands, even with a stable basis for planning.

Like the Cold War, the 21<sup>st</sup> century will require substantial investments. A formula will not provide guidance on how to spend constrained resources or what strategy to follow. Investments must be considered on the merits based on the threat and overall strategy, and not simply on what has been done in the past. Avoiding the perfect storm calls for strategic planning and relentless risk management. Balancing Service portfolios and realigning strategic priorities for available resources provided by the budget ultimately will be a test for the Pentagon leadership.

### **Making Tough Choices on Priorities and Risk**

The Obama administration has inherited the most daunting national security challenges in generations. In addition to the conflicts in Iraq and Afghanistan, the President and his team must grapple with a long struggle against violent extremist groups such as al Qaeda; continued proliferation of nuclear and other weapons of mass destruction to hostile states and potentially to nonstate actors; fundamental shifts in the balance of power, particularly in Asia, where China and India are ascendant; competition for and potentially conflict over energy and other resources, from strategic minerals to clean water; the resurgence of a more autocratic and assertive Russia emboldened by petro-wealth; continued globalization but uneven integration, with an increasing potential for state failure as weak states struggle with demographic, economic, health, and environmental pressures to meet basic needs; and the possibility that global climate change will act as an accelerant, causing mass migrations, more frequent and severe natural disas-

ters, and eventual state failures and conflicts.

The administration faces an uncertain security environment in a very different budgetary context than its predecessor. Gone are the days of a booming economy, \$128 billion in budget surpluses, and Congresses willing to write a blank check for national security in the wake of the terrorist attacks on September 11, 2001. Instead, the President must confront these challenges in the face of unprecedented financial crises, an American economy in recession, the pending retirement of a generation of Baby Boomers and burgeoning Federal spending on entitlement programs, a national deficit and debt that have both reached historic—and horrific—levels, and a Congress that is increasingly focused on reining in defense spending.

As supplemental funding for operations in Iraq declines and pressures to reduce Federal spending intensify, the defense budget—which represents the largest portion of U.S. discretionary spending—is likely to experience the makings of a perfect storm. Operations and maintenance costs will continue to soar as long as the worldwide operating tempo and the cost of energy remain high or increase. Personnel outlays will continue to skyrocket because of increased health care and pension costs, plus the addition of 92,000 personnel to the Army and the Marine Corps. Reset costs resulting from wartime depletions of equipment stocks will almost certainly be more expensive than originally estimated. Moreover, the costs of modernization will increase as weapons systems reach obsolescence and have to be replaced, existing investment programs continue to grow in cost, and new capabilities required to adapt the Armed Forces for missions in the 21<sup>st</sup> century are identified.

Looking beyond current conflicts to over the horizon, the administration faces diverse and worrisome challenges. At the same time, it inherits the heavy weight of stressed and unsustainable defense programs, as well as the vice-grip squeeze of the overriding need to get the national economy in order. The combined task of opening the strategic aperture while simultaneously tightening the defense budget will result in some difficult choices about priorities, as well as the allocation and management of risk.

The United States will have to determine how to balance strategic risk in three ways. The first challenge is to determine how best to allocate resources and risk among current strategic priorities, such as the war in Iraq, expanding operations in Afghanistan, prosecuting the global war on terror, and reducing strains on

our overstretched ground forces. The President must conduct a phased transition in the military posture in Iraq while safeguarding American interests; develop a new strategy and campaign plan for Afghanistan, infusing what has long been an economy of force mission with resources to regain momentum; rethink and reframe strategy for combating extremist groups such as al Qaeda, from the tribal areas of Pakistan to the Horn of Africa and the Maghreb; and initiate steps to lessen the operating tempo and increase the at-home dwell time for members of those units who have experienced the greatest strain over the last 7 years.

The second challenge involves deciding how best to allocate risk when investing in future military capabilities. For example, how much emphasis should be placed on developing capabilities for irregular war relative to capabilities to counter high-end asymmetric threats by rising powers and rogue states? And when competing concepts of operations exist for a particular mission set, which one should determine investments? It is this complex and vexing set of choices that is explored here in detail.

The third and most engaging challenge is balancing current demands against future priorities. In wartime, it is tempting for leaders of the defense establishment to focus almost exclusively on meeting operational demands of the day. This is understandable and in some ways appropriate. But even a wartime Secretary of Defense must be the civilian steward of the defense enterprise; part of the job is ensuring that future Presidents will have the military options they need to protect and advance national security in the face of a rapidly changing security environment. Thus, even as Secretary Gates acknowledged early in his tenure that the top priorities were “Iraq, Iraq, and Iraq,” in reality, he and his senior civilian and military leadership have spent countless hours wrestling with numerous investment decisions that will shape the size and capabilities of the future force.

For the Secretary and his senior team, balancing risk will involve hard choices about investing in people and materiel for current operations versus protecting investment accounts to ensure the development and procurement of new generations of systems to meet emerging and future challenges. Although there are no right answers to these questions, the defense team must both set priorities and manage risk in developing defense strategy, and make tough calls on resource allocation that have been too long delayed, from rationalizing investments in missile defense to planning investments to recapitalize the Navy’s fleet, from enhancing capabilities to check

proliferation and use of weapons of mass destruction to developing the cyber warfare capabilities needed to protect U.S. national interests in the 21<sup>st</sup> century.

Doing so will require careful assessment of the future security environment, judgments about the kinds of demands it may place on the U.S. military, and determination of the options to be developed or preserved for the next President and his successors—and importantly, where the Pentagon can afford to invest less or accept a greater degree of risk.

While it has become commonplace since the first Gulf War to assert that, in the face of the utter dominance of the U.S. military on the conventional battlefield, future adversaries are likely to challenge the United States using asymmetric strategies designed to undermine its strengths and exploit its weaknesses, the DOD program of record has not altered substantially in recognition of this reality. Recent American experience in Afghanistan and Iraq, as well as the recent Israeli combat experience in Lebanon, suggests that future conflicts are likely to assume a hybrid character in which potential adversaries mix traditional, irregular, disruptive, and catastrophic means to best exploit the perceived weakness of the U.S. military.

In practice, this will pull American forces in two very different directions: toward preparing for irregular warfare “among the people” against nonstate actors and weak states that use improvised explosive

devices and suicide bombings on the one hand, and toward preparing for high-end asymmetric threats by rising regional powers or rogue states that use cyber attacks, antiair, and antiship weapons—and even antisatellite weapons or weapons of mass destruction—to deny U.S. access to a region or thwart U.S. operations on the other. Moreover, nonstate actors may acquire and use high-end capabilities such as cyber warfare and weapons of mass destruction to advance their objectives.

Making smart investment decisions in this context will require a new type of decisionmaking process in the Pentagon. Ironically, although virtually everything DOD does involves allocating and managing risk, it lacks a rigorous approach to informing strategic choices about risk at the highest levels. It will, therefore, be critical to establish such a process without delay.

Ideally, this priority-setting process should include a number of key elements. The first would be a comprehensive and open-minded assessment of the future security environment with the aim of identifying both known risks—such as terrorists conducting a nuclear attack on U.S. soil or the risk of future adversaries employing antiaccess strategies against us—and potential discontinuities or uncertainties that could impact the U.S. military in some way over the next 20 to 25 years. Potential wildcard scenarios might range from the collapse of a nuclear-armed state such as North Korea or Pakistan to the



U.S. Air Force (Christopher Matthews)

Maintenance crew tows Global Hawk UAV

emergence of a game-changing technology or weapons system on the battlefield. This assessment should tee up a series of discussions between the Secretary of Defense, Chairman of the Joint Chiefs of Staff, Joint Chiefs, and combatant commanders, aimed at identifying those future challenges that should be given priority in planning and investments as well as uncertainties and wildcards against which the United States should hedge. This assessment should yield a robust yet finite set of focus areas around which the rest of the process should be structured.

The next step would be to delve into each focus area in an effort to better understand its nature, its associated timelines and indicators, and its implications for the U.S. Armed Forces. Most important, this step in the process would develop alternative strategies and concepts of operations for either dealing with known risks, or for hedging against possible uncertainties and wildcards. For example, if the focus area included penetrating the airspace of a sophisticated regional adversary armed with the most advanced air defenses, competing approaches might range from deploying a larger force of fifth-generation fighters, to developing a new strategic bomber with even more advanced stealth and ISR capabilities, to developing a more robust set of long-range conventional precision-strike options.

The third step would be to undertake a comparative assessment of the alternative approaches to better understand relative strengths, weaknesses, associated risks, possible failure modes, capability requirements, and anticipated costs. In essence, this step would encourage and structure a healthy competition of ideas in an effort to help frame key tradeoffs and concrete choices the Secretary of Defense and his civilian and military leadership team must make over the course of the process.

The fourth step would be to determine which strategies and concepts of operations to prioritize in each focus area. This is likely the most difficult and contentious part of the process, as it is where potential “winners” and “losers” are likely to emerge. In some cases, the Secretary of Defense may choose to pursue a single approach to a given challenge, such as assigning a given mission or set of tasks—for example, providing theater airlift to a particular Service and directing others to get out of the business. In others, the Secretary may determine that there is a need for multiple, even redundant options for dealing with a specific challenge, given either the high stakes involved or the varied conditions under which the challenge might

emerge. For example, in the case of advising, assisting, and building the capacity of partner security forces, the Secretary would almost certainly want to have a Special Operations Force–based option for situations in which a minimal American footprint is required, as well as concepts built around general purpose forces in those situations where the United States is working through military-to-military relationships to rebuild a nation’s entire military or a large portion thereof.

The fifth and final step would look across all of the “winners” that have emerged to identify any areas of inconsistency or conflict, and to determine the relative emphasis that should be given to each. In the course of this integrating step, the participants should aim to be as explicit and clear as possible in identifying those areas in which additional risk is being taken, and what might be done to manage or mitigate that risk. The end result of the process would be detailed Secretary guidance for capabilities development and resource allocation.

At every step of this process, it would be useful to incorporate one or more red teams to avoid the trap of group think, to scrutinize underlying assumptions, to question the conventional wisdom of whatever gains traction, to develop solutions that others might not have thought of, and to enrich the range of issues and ideas on the table. Given the highly consequential nature of decisions being made in this process, this would be a prudent way of ensuring that few, if any, stones are left unturned.

Such a process almost certainly would help the Secretary of Defense make better informed decisions. But because even good bets can turn bad, this process would make an even greater contribution by paying more attention to potential wild cards and hedging strategies, thereby improving DOD ability to adapt more quickly to the unexpected.

Although it is crucial for this process to be undertaken early in an administration, it should be more than a one-time exercise. Indeed, it is imperative that the Secretary and Chairman establish an ongoing process of monitoring the changing security environment and conducting net assessments to identify changes that may cause them to rethink their bets. Their staffs also should monitor and evaluate the execution of priority strategies and hedging efforts to determine whether and where adjustments are needed. This does not mean that no decision is final, or that decisions taken can be continually revisited. Rather, the process should be dynamic, with defined and regular feedback into the planning, program-

ming, and budgeting processes of the Pentagon. Although it will not be possible to get the right answer all the time, it should be possible to get much better answers over time.

Some might argue that elements of this approach already exist. Every Secretary goes through some process of setting priorities and translating them into guidance for developing the capabilities he believes the military will need in the future. For their part, the Services and Joint Staff routinely assess concepts of operations and future capability requirements. But there are several attributes of the proposed process that set it apart. It is leader-driven rather than staff-driven. It brings together the most senior civilian and military leaders in a collaborative process. It structures a competition of concepts and ideas with the aim of enabling hard-nosed choices and tradeoffs (rather than making consensus the ultimate objective). And it incorporates red teaming and dynamic feedback throughout the process. Taken together, these various attributes make the proposed process a new, if commonsensical, approach.

During World War II, General Dwight Eisenhower reputedly stated, “plans are nothing [but] planning is everything.” Given the immense national security challenges and economic pressures we face, hard choices have to be made and none are devoid of risk. These hard tradeoffs will remain at every feasible budget level; we cannot buy our way out of making these risk allocation decisions. And to defend their budget, at whatever level, defense leaders must demonstrate that they have made the hard-nosed assessments and tough choices. It is, therefore, imperative that, even in the face of the pressures of ongoing operations, the Secretary establish and lead, in partnership with the Chairman, a process that engages his senior civilian and military leaders in a sustained planning effort to identify where to prioritize and how to manage risk.

The QDR is the essential first step in this new planning process. To make it a success, the Secretary must redefine and rescope the QDR process by changing the planning paradigm as described above; by making at least some hard choices to redress the currently unsustainable budgetary posture; and, most important, by laying the groundwork for a sustained effort that will help the U.S. military be better prepared and better able to adapt to the requirements of the 21<sup>st</sup> century. Whether the next QDR can meet these ambitious expectations and stand the test of time, rigorously working through these issues, and “norming and forming” the Pentagon team in the

process, will be of incalculable value at a time of great consequence. **gsa**

## NOTES

<sup>1</sup> Much of what is asserted here about stress applies to the Marine Corps as well as the Army. Because another section of this chapter focuses on the Marines, this section refers only to the Army.

<sup>2</sup> See, for example, Gian P. Gentile, “Misreading the Surge Threatens U.S. Army’s Conventional Capabilities,” *World Politics Review Exclusive*, March 4, 2008.

<sup>3</sup> Remarks as delivered by Secretary of Defense Robert M. Gates to the Association of the U.S. Army, Washington, DC, October 10, 2007.

<sup>4</sup> *Ibid.*

<sup>5</sup> See, for example, John A. Nagl, *Institutionalizing Adaptation: It’s Time for a Permanent Army Advisory Corps* (Washington, DC: Center for a New American Security, June 2007); Peter W. Chiarelli with Stephen M. Smith, “Learning From Our Modern Wars: The Imperatives of Preparing for a Dangerous Future,” *Military Review* (September-October 2007); Bob Killebrew, *The Left-Hand Side of the Spectrum: Ambassadors and Advisors in Future U.S. Strategy* (Washington, DC: Center for a New American Security, June 2007).

<sup>6</sup> See Leonard Wong, “Fashion Tips for the Field Grade,” U.S. Army War College, Strategic Studies Institute, October 4, 2006, available at <[www.strategicstudiesinstitute.army.mil/pdffiles/PUB731.pdf](http://www.strategicstudiesinstitute.army.mil/pdffiles/PUB731.pdf)>.

<sup>7</sup> Yochi J. Dreazen, “Army to Promote Training as Career Path,” *Wall Street Journal*, June 19, 2008, A3. Chief of staff’s email accessed at <<http://council.smallwarsjournal.com/showthread.php?t=5593>>.

<sup>8</sup> See Dreazen for reference to a widely circulating email expressing the skepticism with which many no doubt see the current effort to upgrade the status of advisors.

<sup>9</sup> France operates one aircraft carrier and three helicopter carriers. The United Kingdom has two operational STOVL carriers (and a third in reserve) and one helicopter carrier. Italy operates two STOVL carriers. Russia and Brazil each operate one aircraft carrier. Spain, India, and Thailand each operate one STOVL carrier. South Korea and Japan both operate one helicopter carrier (although both are physically large enough to operate STOVL fighters). See Stephen Saunders, ed., *Jane’s Fighting Ships 2007–2008* (Surrey, UK: Jane’s Information Group, 2007).

<sup>10</sup> Russia has the largest non-U.S. nuclear-powered fleet, with 18 SSNs and 7 SSGNs. The United Kingdom, France, and China operate nine, six, and five SSNs, respectively. See Saunders.

<sup>11</sup> See “Prepositioning Ships,” “Sealift Ships,” and “Ready Reserve Force Ships,” available at <[www.msc.navy.mil/inventory/inventory.asp?var=program](http://www.msc.navy.mil/inventory/inventory.asp?var=program)>. The 110-ship

prepositioning and sealift fleet includes ships maintained in reduced operating status by the Maritime Administration.

<sup>12</sup> See *A Cooperative Strategy for 21<sup>st</sup> Century Seapower*, October 2007, available at <www.navy.mil/maritime/MaritimeStrategy.pdf>.

<sup>13</sup> *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2007* (Washington, DC: Department of the Navy, n.d.), 5. The table's comments have been updated and modified.

<sup>14</sup> All figures are in FY09 dollars. From Congressional Budget Office, "Resource Implication of the Navy's FY 2009 Shipbuilding Plan," June 9, 2009, available at <www.cbo.gov/ftpdocs/93xx/doc9318/06-09-Shipbuilding\_Letter.pdf>.

<sup>15</sup> As Ron O'Rourke, naval analyst at the Congressional Research Service, stated to the American Society for Naval Engineers on June 23, 2008, "The Navy's estimated cost for implementing [its] plan is so large that the Navy no longer appears to have a credible, announced strategy for generating the funds needed to implement [its] 30-year plan."

<sup>16</sup> As Secretary of the Navy Donald Winter stated to the Current Strategy Forum at the Naval War College on June 17, 2008, "We simply cannot afford a 313-ship Navy that averages out to over \$3 billion a ship."

<sup>17</sup> For an overview of these strategic challenges, see Andrew Krepinevich, Robert Martinage, and Robert Work, *The Challenges to U.S. National Security* (Washington, DC: Center for Strategic and Budgetary Assessments, 2008).

<sup>18</sup> The Chinese routinely talk about contesting U.S. operations out to the "second island chain," which includes the Japanese Bonin Islands and the Marianas Islands, including the U.S. territory of Guam. Guam sits roughly 1,510 nautical miles from Taiwan and about 1,590 nautical miles from the Chinese mainland. See "[People's Liberation Army] Navy," *Jane's Sentinel Security Assessment—China and Northeast Asia*, June 21, 2007.

<sup>19</sup> See, for example, Roger Cliff et al., *Entering the Dragon's Lair: Chinese Anti-access Strategies and Their Implications for the United States* (Santa Monica, CA: RAND, 2007).

<sup>20</sup> This observation is based on an undersea assessment developed for the Office of Net Assessment, Office of the Secretary of Defense, to which the author contributed.

<sup>21</sup> Unless otherwise stated, these changes refer to the plans outlined in Office of the Chief of Naval Operations, "Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2009," February 2008.

<sup>22</sup> See Thomas P. Ehrhard and Robert O. Work, *Range, Persistence, Stealth, and Networking: The Case for a Carrier-based Unmanned Combat Air System* (Washington, DC: Center for Strategic and Budgetary Assessments, 2008).

<sup>23</sup> The SSGNs are optimized as cruise missile submarines. Of the 24 missile tubes on each SSGN, 2 are storage/access tubes; the remaining 22 can each carry 7 Tomahawk land attack cruise missiles. The 22 missile tubes can also be optimized to carry, launch, and recover UUVs.

<sup>24</sup> For a more detailed discussion of this plan, see Robert O. Work, *Know When to Hold 'Em, Know When to Fold 'Em: A New Transformation Plan for the Navy's Surface Battle*

*Line* (Washington, DC: Center for Strategic and Budgetary Assessments, 2007).

<sup>25</sup> By replacing the current LSD force with LPD-17s, the LSDs would be decommissioned before the end of their expected 40-year service lives. The Navy should take the seven in best condition, convert them into auxiliary LSDs, and assign them as command ships for the Global Fleet Stations.

<sup>26</sup> These ships would be variants of the Coast Guard National Security Cutter now in serial production. With Coast Guard law enforcement detachments as part of their crews, they could perform a wide range of maritime and homeland security missions. Operating eight Maritime Security Cutters seems a natural fit for the Naval Reserve, and would be a powerful symbol for the idea of an integrated National Fleet.

## Contributors

**Dr. Thomas X. Hammes** (Chapter Editor) served 30 years in the U.S. Marine Corps, including duty in Somalia and Iraq. He holds a Masters of Historical Research and Ph.D. in Modern History from Oxford University and has lectured widely at U.S. and international staff and war colleges. He is the author of *The Sling and the Stone: On War in the 21<sup>st</sup> Century* (Zenith Press, 2004) and over 80 articles and opinion pieces.

**Michèle A. Flournoy** is Undersecretary of Defense for Policy. Prior to this appointment, she was the President and Co-Founder of the Center for a New American Security and previously served as a Distinguished Research Professor at the National Defense University and as Principal Deputy Assistant Secretary of Defense for Strategy and Threat Reduction and Deputy Assistant Secretary of Defense for Strategy.

**Robert L. Goldich** is an independent consultant on defense issues. When he retired from the Congressional Research Service in 2005 after 33 years of service, he was the senior CRS military manpower and personnel analyst. He holds degrees from Claremont McKenna College and The George Washington University, and is a graduate of the National War College.

**Lieutenant Colonel Frank G. Hoffman, USMCR (Ret.)**, is a Research Fellow in the Center for Emerging Threats and Opportunities at the Marine Corps Combat Development Command.

**Dr. Thomas L. McNaugher** is a Senior Analyst at the RAND Corporation. He is a former director of the RAND Arroyo Center, and author of *New Weapons, Old Politics: America's Military Procurement Muddle* (The Brookings Institution Press, 1989) and *Arms and Oil: U.S. Military Strategy in the Persian Gulf* (The Brookings Institution Press, 1985).

**Lieutenant General Charles E. Stenner Jr.** is Chief of Air Force Reserve, Headquarters U.S. Air Force, Washington, D.C., and Commander, Air Force Reserve Command, Robins Air Force Base in Georgia.

**Robert O. Work** is Under Secretary of the Navy. Previously he was Senior Vice President at the Center for Strategic and Budgetary Assessments. A former Marine colonel, he specializes in defense strategy, revolutions in war, and naval affairs. He is an Adjunct Professor at The George Washington University.