

RAND REVIEW

Summer 2001

Vol. 25, No. 2

SHIPSHAPE

*A Reorganized Military for a
New Global Role*

Full Disclosure

Time for the Naked Truth About Health Care

—By Elizabeth A. McGlynn and Robert H. Brook

Power to the Cities

A Homegrown Way to Recharge California

—By Mark Bernstein, Paul Dreyer, Mark Hanson, and Jonathan Kulick

Message from the Editor

Three of the most heated national debates throughout the spring and summer of 2001 have revolved around military transformation, health care, and energy policy. Herein we try to place each of those issues in a fuller context and describe some strategies that should remain valid long after the current legislative sessions and budget battles have subsided.

Pentagon planners, in the wake of lengthy reviews of the U.S. defense establishment, will soon release their recommendations for transforming the armed forces to meet the challenges of a post-cold war world. Regardless of what specific changes might occur in the next fiscal year or two, a decade of RAND research argues for a series of ambitious global reorganizations that reach across the armed forces of the United States and sometimes across those of the allies. The unifying thread that runs through the various strands of research is that the armed forces of the United States face a much broader role than before, which requires much greater integration among friendly forces, which in turn requires sweeping reorganizations across those forces.

The most recent debate about health care has focused on patients' rights, or the lack thereof, in managed care organizations. Related debates have focused on Medicare coverage of prescription drugs and on expansion of health insurance to the uninsured. All of these debates reflect persistent doubts about the quality of care provided in America, but the chronic irresolution of the debates also reflects an inability to agree on better alternatives. A major part of the problem, according to Elizabeth McGlynn and Robert Brook, is that we don't even know how bad our system really is. They propose a way to find out, and then they propose a way to keep public pressure on health care providers to improve their services.

A winter and spring of dire warnings about California's energy crisis have been followed by a summer of exceptional content. But neither the state nor country is yet out of the untamed woods of electricity deregulation. Myriad legal, political, and financial proposals have been made to resolve the crisis, but perhaps no proposal is as intriguing as the one outlined here by a team of RAND researchers: Rely more on municipal power generation to serve local needs. There will be no single solution to the energy crisis, but municipal power generation would be a smart addition to a balanced portfolio of energy investments.

—John Godges

RAND REVIEW

Summer 2001

Vol. 25, No. 2

3 News

Invisible women make themselves heard • Task force on Russia finds reasons for hope • Population of Russia shows signs of despair • Antidrug policy in Colombia misses the point

8 Full Disclosure

Time for the naked truth about health care
By Elizabeth A. McGlynn and Robert H. Brook

12 COVER STORY Shipshape

A reorganized military for a new global role

20 Power to the Cities

A homegrown way to recharge California
By Mark Bernstein, Paul Dreyer, Mark Hanson, and Jonathan Kulick

On the Cover

Ida Grigson, a builder constructionman from Naval Mobile Construction Battalion One, of Gulfport, Miss., paints a rebuilt bridge during Exercise Tandem Thrust in Queensland, Australia, on May 6, 2001. Tandem Thrust is a biennial exercise of air, land, maritime, amphibious, and special operations forces from the United States, Australia, and Canada. More than 18,000 personnel participated this year. The majority of U.S. forces involved were from Marine Corps units based in Hawaii and Japan. Sponsored by the U.S. Joint Chiefs of Staff and the U.S. Pacific Command, the month-long exercise focuses on the planning of combined operations and the interoperability of multinational forces. The exercise also demonstrates U.S. resolve to support the security and humanitarian interests of friends and allies in the Pacific region.

U.S. DEPARTMENT OF DEFENSE/SGT. BOB O'DONAHOO, AUSTRALIAN ARMY

RAND Review is published periodically by RAND, a nonprofit institution that helps improve policy and decisionmaking through research and analysis. Opinions are those of the authors and do not reflect positions taken by RAND, its board, or its sponsors. Although permission is not required to quote from articles, *RAND Review* should be credited. Submit letters to Editor, *RAND Review*, 1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138, or email godges@rand.org. For extra copies of *RAND Review* at no charge, contact RAND Distribution Services at (877) 584-8642 (toll free), (310) 451-7002, or send your name, request, and postal mailing address to order@rand.org.

Visit RAND at www.rand.org

Visit *RAND Review* at www.rand.org/publications/randreview

Report on “Invisible Women” Gains Conspicuous Visibility

A groundbreaking book that chronicles what it is like to be the wife of a junior enlisted soldier in the U.S. Army has attracted widespread attention from congressional leaders, national media, and army wives themselves.

The book, *Invisible Women: Junior Enlisted Army Wives* (RAND/MR-1223), by RAND analyst Margaret Harrell, focuses on individual stories rather than quantitative data and thus differs from the usual RAND report, perhaps because it wasn't produced from a RAND research project.

The stories were excerpted from Harrell's dissertation research, which involved interviews with over 100 army wives as well as discussions with army personnel and civilian employees of the army. Although highly personal, the stories of the three women featured in *Invisible Women* encapsulate the experiences of many of the other junior enlisted wives interviewed, said Harrell.

The author, who grew up in an army family herself, discovered a pervasive negative stereotype of the junior enlisted wives during her fieldwork. She found that the wives are perceived by many to be “young, immature, lower-class spouses who are in financial difficulty and who have difficulty controlling their reproductive tendencies.” The stereotype often implies that the problems faced by junior enlisted soldiers and their wives are self-imposed.

Harrell selected the three women in the book for both their similarities and dissimilarities to the stereotype. None of the women finished college directly out of high school. Two had experienced unintentional pregnancies. Two of the couples faced significant financial problems. All three families had received financial assistance. On the other hand, none of the wives indulged in extravagances. All were committed to their marriages and their husbands' careers. All had worked to support their households, and one was an older woman who had set aside her professional career to marry a soldier.

Harrell argues that pigeonholing the women into the stereotype ignores the systemic forces at work. Financial hardship, she explained, is endemic among enlisted families. Army posts are often located in depressed areas where wives have difficulty finding employment. The irregular schedules of soldiers make it harder for wives to find work. And when soldiers are deployed, the wives who have children find it extremely difficult to work and care for their families.

Invisible Women has garnered favorable reviews from *The Army Times*; the National Military Family Association; the United Armed Forces Association's publication, *The Communicator*; the *Midwest Book Review*; the *National Journal*; and *militarylifestyle.com*. In May, Harrell addressed the wives of two-star generals at a conference at Fort Leavenworth, Kan. In June, she briefed staff from the offices of the California congressional delegation.

The attention has provoked some contrary reactions as well. In July, *Time* magazine described a “Visible Women” web site, which encourages the wives of G.I.s to counter the negative portrayals of them featured in Harrell's book. Reviews on Amazon.com generally give the book either a one-star or a five-star rating—either the worst or the best.

Harrell believes that the experiences of military spouses differ considerably by rank and that military leaders and policymakers should consider the perspectives of junior personnel.

Pay increases are not necessarily the best way to solve the problems of enlisted families, according to Harrell.

She cites other potential solutions.

For example, the army could provide steady and dependable income for families by reducing fluctuations in separate rations payments when the soldier is away from home. Or the army could eliminate allotment payment agreements that encourage the accumulation of debt.

Harrell acknowledges that determining the most appropriate role for the military in solving the problems will be difficult. Nonetheless, the attention the book has received has opened a dialogue about the problems of junior enlisted personnel and their families, which was the author's original intent.

Pigeonholing the women into the stereotype ignores the systemic forces at work.

Bipartisan Task Force Tills Common Ground with Russia

Declaring that “we are at a dramatic turning point in history” that could herald the “transformation of the U.S.-Russian relationship,” a bipartisan task force convened by the nonprofit EastWest Institute has identified far-reaching opportunities for security, political, and economic cooperation between the two former cold war adversaries.

Three former U.S. senators—David Boren (D-Okla.), John Danforth (R-Mo.), and Alan Simpson (R-Wyo.)—cochaired the task force. Its report was coauthored by John Tedstrom, a RAND economist; John Mroz, president of the EastWest Institute; and Sherman Garnett, of Michigan State University. The senators and authors presented their findings to President George W. Bush, Vice President Dick Cheney, and National Security Adviser Condoleezza Rice at the White House on July 16, just days before the G-8 Summit in Genoa, Italy.

The task force examined the record of Russian President Vladimir Putin over the preceding 18 months and found reason for optimism, despite persistent problems in Russia, such as human rights abuses in Chechnya and widespread corruption. The report points to three areas of unprecedented opportunities for U.S.-Russian cooperation:

- a security relationship that goes beyond deterrence
- a political relationship that incorporates Russia into Europe

- an economic relationship that relies less on instruction and more on collaboration.

Regarding the security relationship, the task force argues that both the United States and Russia share a major stake in making progress on several fronts. Both countries should dramatically reduce their levels of nuclear weapons; reinvigorate their efforts to prevent the leakage of nuclear materials and know-how from Russia; and help other countries, such as India and Pakistan, to minimize the risk of nuclear accident or misunderstanding. The task force says that Russia should also be included in the research and development of a ballistic missile defense.

Regarding the political relationship, the task force proposes nothing less than the “transformation of NATO itself” to embrace Russia, Ukraine, and the other states of the former Soviet Union within a broader collective security mission. Two days after the release of the report, Putin himself urged Russia’s eventual inclusion in NATO or else its replacement with a new organization that would include Russia.

NATO has already begun to shift its focus toward broader roles of peacekeeping, disaster relief, and fostering political cooperation. Therefore, according to the bipartisan task force, “the logic that drives [NATO] enlargement to the east now will ultimately have to apply to even such states as Russia and Ukraine.” To argue otherwise would be “to declare a de facto permanent dividing line in Europe. This, obvi-

ously, is not in the interest of any of the countries involved.”

The task force believes that the Putin team has also planted the seeds of a potentially fruitful economic reform agenda, including legislative proposals in areas such as tax reform, welfare reform, property rights, and regulation of monopolies. “President Putin and his economics team have articulated a reform agenda that, finally, appears to take on many of the vested interests that prevented reforms from moving forward during the Yeltsin era.”

In the 1990s, U.S.-Russian economic relations were dominated by U.S. efforts to render technical assistance to Russia in hopes of accelerating economic reform. Russia also sought economic assistance from the International Monetary Fund and the World Bank. Today, the report urges, “it is time drastically to restructure those channels of engagement, to move from Russian dependence on foreign assistance to institutional collaboration.”

The report lists several ways to build stronger economic, commercial, and scientific bridges:

- exchanges that introduce Russian lawmakers, journalists, and educators to U.S. businesses, and vice versa
- expansion of educational exchanges of Russians studying in U.S. business schools
- “twinning” programs that match government officials in the United States with their Russian counterparts
- expansion of micro-credit programs for small businesses

- expansion of scientific and technological collaboration
- collaboration to fight global problems such as HIV/AIDS.

Although the burden will ultimately depend on Russia to make the changes it needs, “the United States and the West must provide support,” the report concludes. “In our view, support no longer means endless advice or limitless doses of foreign aid. It means sustained and pragmatic engagement between our citizens, our societies, our businesses, and our governments.”

Multiple Causes Cited for Russian Population Decline

A new RAND study cites the long-standing desire for smaller families and the penchant for heavy drinking as two of the leading causes of population decline in Russia.

Since the fall of the Soviet Union nearly ten years ago, the number of deaths in Russia has exceeded the number of births each year (see figure). The Russian population has declined from 148 million to 145 million since 1992. Demographers project a further drop to 142 million by 2010, when Russia is likely to drop in the ranking of the world’s most populous countries from sixth to ninth, falling behind Pakistan, Nigeria, and Bangladesh.

Julie DaVanzo and Clifford Grammich, authors of *Dire Demographics: Population Trends in the Russian Federation* (RAND/MR-1273-WFHF/DLPF/RF), point out that the declining birth rates in Russia precede the fall of the Soviet Union and are not unique among

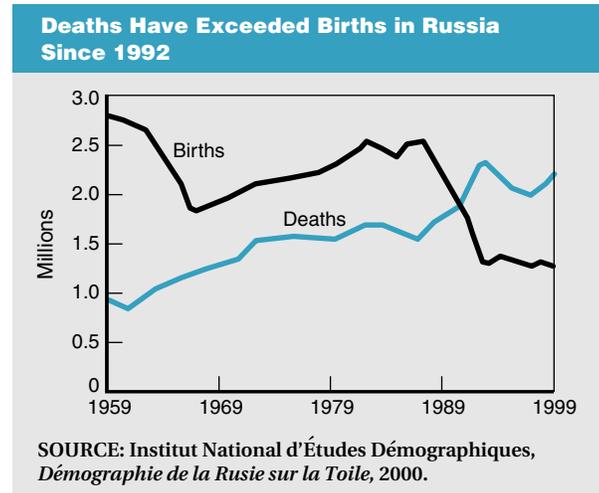
developed countries. Russia’s low fertility rate, however, has been accompanied by one of the highest abortion rates in the world, which has led to substantial health problems among women. According to some Russian estimates, one in ten Russian women is left sterile by the operation, further contributing to the population decrease by preventing future births.

In recent years, a freer market for contraceptives has led to a decline in abortions. Since the late 1980s, more births have been prevented through contraception than by abortion. Even today, however, seven in ten Russian pregnancies end in abortion, compared with three in ten in the United States.

Rising death rates have been especially apparent among working-age men. Alcohol-related accidents, poisoning, and violence have been strongly correlated with these higher death rates. There has also been an increase in cardiovascular disease among both genders in Russia, which could be related to stress after the breakup of the Soviet Union. Unlike the declining birth rates, the rising death rates were particularly evident in the wake of the breakup.

In the coming years, Russia can expect its elderly population to grow while its working-age and youth populations shrink. Population aging will present severe challenges to a health system facing myriad other problems. The government has few resources to strengthen the safety net for the elderly, and the elderly have few resources from which to draw.

The most promising short-term measures that Russia can take to reverse its demographic decline have to do with improving its health care system. Continued improvements in contraceptive access can help Russian women lead healthier reproductive lives, help reduce maternal mortality, and help devote maternal health resources to intended pregnancies. Health education campaigns, similar to those undertaken in the United States, could reduce smoking and drinking, improve dietary habits, and increase physical activity, especially among men. Neighboring countries can also offer Russia many lessons about restructuring its health care system.



In the long term, many demographic problems may prove intractable without substantial economic improvement, say the authors. Until the Russian economy and society are able to support not just an increased number of people but also an improvement in the quality of their lives, the dire demographic trends that we now see in Russia may persist.

Colombia Watchers Point to Minefield of Drugs, Politics

Even seasoned analysts of international policy are daunted by what's happening in Colombia today. The key players in the country have remained the same for decades: the government; the leftist guerrillas, who seek to overthrow the government; and the right-wing paramilitary groups, who seek to protect citizens from the guerrillas. Yet the violence has escalated in recent months, the result of a complex three-sided civil war over drugs, money, and politics.

Threats to democracy and stability in Colombia “could confront the United States with its most serious security crisis in this hemisphere since the Central American wars of the 1980s,” said Angel Rabasa, a RAND analyst and co-author, with Peter Chalk, of a new book about the crisis.

Colombian Labyrinth: The Synergy of Drugs and Insurgency and Its Implications for Regional Stability (RAND / MR-1339-AF) comes at a time when the United States is debating its policy toward Colombia. Traditionally, U.S. assistance programs aimed at the coun-

try have sought primarily to stanch the flow of narcotics into the United States. But given the growing incidence of murder, violence, and kidnapping, Rabasa suggests that the United States should do more to help Colombia improve its conventional military capabilities. Other observers call for humanitarian intervention or other international strategies as well.

The dominant guerrilla group, known as the Revolutionary Armed Forces of Colombia (FARC), has been operating since the 1960s. During the last decade, the guerrillas' power has been fueled by money from international drug trafficking. Today, the guerrillas are neither just a leftist insurgency nor a criminal drug cartel; rather, they are a sophisticated organization that incorporates elements of both.

The right-wing paramilitary groups, formed in the early 1980s to protect villages from left-wing guerrilla attacks, are also funded by drug profits and have become a formidable presence. According to the Center for International Policy in Washington, “the paramilitaries are responsible for about 75 percent of all politically motivated killings and the vast majority of forced displacements in Colombia.”

The Colombian government, led by President Andres Pastrana, has initiated peace talks with the FARC, but progress is slow. Meanwhile, antagonism between the paramilitary groups and the government has intensified.

The paramilitary groups have become key players in Colombia, according to Ana Maria Salazar,

former deputy assistant secretary of defense for drug enforcement in the Clinton administration. “The new [paramilitary] leadership believes that the previous leaders had been too soft—too soft with the guerrillas and too soft with the government,” she said during a July seminar at RAND headquarters in Santa Monica, Calif. “I believe things are going to get worse.”

She cited next year's presidential election in Colombia as an opportunity for political groups to strengthen their position with whatever new government comes into power. The election, along with increased paramilitary power, will raise the stakes, she said. “I think we'll be shocked at how bad it will get.”

The violence has already begun to fray the fabric of Colombian society, according to Rabasa. “The economy, historically one of the strongest in Latin America, is experiencing its worst recession since the 1930s,” he said. “The violence has generated 1.5 million internal refugees, a figure larger than the number displaced in the Balkan conflicts, and has severely strained social institutions.”

The United States has been relatively laissez-faire in Colombia's affairs except in terms of anti-narcotic initiatives. “When we look at what the United States is actually doing in Colombia, the Pentagon's role is minimal,” said Salazar. “Now that the United States has trained the counternarcotics battalion, our role is actually very small compared to what many people imagine.”

Caught in the crossfire between left-wing guerrillas and right-wing paramilitary groups, villagers in La Caucana, in the Antioquia state in northwestern Colombia, view the body of a man killed on April 16, 2001. Guerrillas of the Revolutionary Armed Forces of Colombia (FARC) attacked the village, killing at least nine people and accusing the residents of supporting the paramilitary groups.



AP/WIDE WORLD PHOTOS/LEON MONSALVE

But this could change. In July, the U.S. House of Representatives approved foreign aid legislation to eradicate drugs and also to bring political stability to Colombia and its neighbors. At press time, the U.S. Senate was debating the Andes antidrug initiative. According to proponents of the bill, it reflects a necessary balance between social and economic development on the one hand and, on the other hand, drug eradication, drug interdiction, and law enforcement programs.

But such proponents are careful to avoid words like “military intervention” or “increased military assistance,” which call to mind images of tanks and soldiers. When the Andes initiative was being considered in the House, Rep. John Conyers (D-Mich.) called for a combined limit of 800 U.S. military and civilian workers in Colombia, saying the restrictions are necessary to prevent Vietnam War–like “mission creep.” His amendment was approved by a voice vote.

Salazar is quick to point out the similar hesitation of U.S. military leaders. “Given my experience in the Pentagon, there’s no way that anyone there would advocate for military intervention,” she said. “They are already nervous about the situation.”

How, then, should the United States proceed? According to Rabasa, the current U.S. policy, which emphasizes counternarcotics operations, misses the point. “Drugs and insurgency in Colombia are intertwined in complicated and changing ways, but the former

cannot be addressed without the latter,” he said.

“The United States ought to rethink whether the distinction between counternarcotics and counterinsurgency can be sustained—and whether Colombia and its allies can be successful in the war against drugs if the Colombian government fails to regain control of its territory and population.”

The United States has taken the lead in mustering international support for “Plan Colombia,” the Colombian government’s blueprint for restoring stability. This plan gives priority to moving against the drug producers and traffickers, thereby also sapping the guerrillas’ funding. The plan relies on peace negotiations to end the insurgency.

If that strategy falters, according to Rabasa, the United States would be confronted with a dilemma: Either escalate the U.S. commitment or scale it down. Scaling down could lead to a loss of credibility and a decreased ability to protect U.S. interests in the region. Escalating could be even more dangerous.

To avoid either outcome, he said, the United States should step up its support now for the Colombian government and military. The United States should assist Colombian efforts to reform its military forces, to improve antiguerrilla operations, and to regain control of the major roads and rivers. Meanwhile, the United States should work with neighboring countries to contain the risk of regional spillover and destabilization and to pave the way for



DIANE BALDWIN

Ana Maria Salazar, professor at the Instituto Tecnológico Autónomo de México and former U.S. deputy assistant secretary of defense for drug enforcement, says it may be time to consider humanitarian interventions and other international strategies to manage the deepening crisis in Colombia.

a multilateral response if containment efforts fail.

“The United States is the only realistic source of military assistance on the scale needed to redress the currently unfavorable balance of power,” said Rabasa. “Strengthening the state and its security forces—which bear the brunt of the struggle to reestablish the state’s authority—should be the focus of U.S. policy toward Colombia.”

Salazar concurs with Rabasa, but she also maintains that a broader range of multilateral options be considered. She suggested that the United States and other nations consider imposing an international criminal court or tribunal against the warring parties in Colombia. Other strategies could be to convene a multinational civil protection force or to provide humanitarian relief for the displaced. Still another option is for the United States to do nothing. “The United States may just have to step away,” she conceded.

“In the end, it is up to the Colombian government and society to win or lose the conflict,” said Rabasa. “U.S. support will be important, but it cannot substitute for Colombian political will and clear strategic thinking.” ■

Full Disclosure

Time for the Naked Truth About Health Care

By Elizabeth A. McGlynn and Robert H. Brook

Elizabeth McGlynn is the director of RAND's Center for Research on Quality in Health Care. Robert Brook is a RAND vice president, director of the RAND Health program, and professor of medicine and health services at UCLA's Center for Health Sciences.

Medical mistakes kill up to 98,000 Americans every year.

Tens of millions of Americans receive treatment that is inadequate, incompetent, or unnecessary.

The problems will almost surely worsen as the U.S. population ages.

Yet we still don't know how bad our health care system really is—or, therefore, how to fix it.

Media reports of shoddy health care in this country provoke either mass denial or a collective yawn.

Occasional revelations of health care problems here incite a day or two of media commotion—but no sustained policy action to fix the problems.

In contrast, Congress took immediate action to identify and rectify the problems that produced defective Firestone tires in the past few years. And the Federal Aviation Administration ordered Boeing to redesign the faulty rudders on its 737s after a series

of crashes in the past decade. So how is it that a danger as widespread as poor health care can receive only passing notice while isolated problems—defective auto tires, faulty airplane rudders—can preoccupy journalists and policymakers until the problems are

fixed? Given the public outcry over a few deaths from bad tires, the lack of public outrage over thousands of medically preventable deaths is astounding.

We've investigated what makes the health care system impervious to improvement and also what makes Americans indifferent to incriminating evidence about their system. We've concluded that the quality of care cannot improve until physicians and hospitals nationwide are held accountable to common measures of performance. We've concluded further that patients and politicians cannot readily grasp the need for improvements—and thus advocate for change—until the information about quality of care is communicated clearly and consistently.

We recommend nothing short of a war on poor quality of care in the United States. This war would require the same level of public commitment as the war on cancer or the campaign to put a man on the moon. The primary weapon in such a war would be a national system to measure the quality of care everywhere. The cost would be a few billion dollars a year, but that is just a fraction of the current \$19 billion budget of the National Institutes of Health and just a drop in the bucket of the nation's total annual health care bill of more than \$1 trillion.

A Clogged System

Several factors make the health care system—in the United States as well as in every other country in the world—uniquely resistant to change compared with other economic sectors. Strategies to improve the quality of care must account for these peculiarities:

- *Diffuse responsibility.* Poor quality of care is rarely the fault of a single company, like Firestone or Boeing. Instead, responsibility is diffused across

The lack of public outrage over thousands of preventable deaths is astounding.

thousands of hospitals and private practices. The diffusion of responsibility means that nobody takes responsibility. There is rarely a credible threat that poor-quality providers will be driven out of business or even suffer a significant loss of revenue. Therefore, solutions must also apply across the board.

- *19th-century clinical practices.* Despite amazing advances in medical equipment, drugs, and surgical techniques, most physicians and hospitals rely on illegible handwritten notes to track a patient's progress and to prescribe medications. Meanwhile, doctors are expected to remember the diagnoses and treatments for a multitude of diseases that afflict an infinitude of types of people. Much of the medical establishment dismisses attempts to introduce standard practice guidelines as "cookbook" medicine, as if consistent delivery of best practices were a bad thing.

- *Cognitive dissonance.* Most people assume that their doctor is excellent and that any problems identified by researchers, accreditors, the media, or malpractice lawyers apply to other doctors. Most doctors assume that they deliver good care and that bad care is the domain of other doctors.

- *Shoot-the-messenger attitude.* Doctors and health system administrators typically spend more energy undermining the findings about poor quality than seeking solutions. A typical response to quality-of-care studies is to claim that the data are inaccurate or unrepresentative of specific hospitals or practices. Another typical response is to refuse to gather good information.

- *Information vacuum.* There is no national tracking system to identify where defects lie and to correct them before patients die. There are few early warning systems to nip defects in the bud, no systems to ensure the consistent exercise of best practices, and little information about what strategies for improvement might work on a large scale.

Clear the Clog

Improving the quality of care will require, first and foremost, strong leadership from both the public and private sectors. The leadership must establish a national tracking system and sustain public support for it. We need to do the following:

- *Exercise leadership.* The role of government is particularly critical, a fact that has been recognized in all Western countries except the United States. In this country, Medicare could become a driving force for

improvement. The government could stipulate that the recipients of Medicare payments meet higher standards of reporting on the quality of care they provide. Meanwhile, advocacy organizations that have been dedicated to curing specific diseases, such as HIV or breast cancer, could demand that private companies, public agencies, and other health insurance providers pay only for high-quality care that is consistent with best practices. We have walks to cure cancer and AIDS; but until there are cures, people are still getting mediocre care.

- *Develop a computerized information system.* No serious advances in quality of care can be made without a computerized system for receiving and transmitting information. Computerized ordering systems have been shown to reduce errors in filling prescriptions. Computers are also necessary to gather and compare national data on quality. For the 70–100 procedures that dominate what physicians do, we need a computerized system to ensure that doctors ask patients the right questions. The patients would need to verify their responses. The answers from patients, combined with clinical information, would indicate the appropriateness of any medical procedure administered.

Private insurance companies should lead the way by making the investment in computer systems an allowable expense in calculating health insurance premiums. The government should evaluate tax incentives and other rewards that might further spur the use of computers in medical offices. Computer hardware and software for clinical management could become a condition of licensure, contracting, malpractice insurance policies, and reimbursements. With the help of government- and private-sector financial incentives, a system could be in place within five years.

- *Monitor and report on performance routinely.* An independent group, funded by the government, should compile information on average levels of quality, varying levels of quality, and increases or decreases in quality. There have been scattered attempts to do this, but the funding has been grossly inadequate. For an example of the potential payoffs, consider New York state's Cardiac Surgery Reporting System. Three years after the system was introduced in 1989, mortality rates after coronary artery bypass surgery in the state

A visitor from Mars might conclude that the purpose of the U.S. health care system is to spend money.

declined by 41 percent, which was considerably better than the national average. In the future, similar public reporting systems should gauge the quality of health care administered nationwide.

- *Ensure adequate funding for quality measurement.* Sustained investments of a few billion dollars per year must be made to set national standards, promulgate scientifically valid measures for monitoring improvement, provide information to physicians on best practices, and make the results easily accessible to decisionmakers and the broader public. This is not a trivial enterprise.

These achievements are within our grasp within the next five years. We spend more money on health care than any country in the world.

One of every seven dollars we spend goes to health care. We have sophisticated physicians and social scientists. We have a set of quality assessment tools. However, a visitor from Mars might conclude that the purpose of the U.S. health

care system is to spend money—and that most of health policy is about who gets the money: doctors, lawyers, or administrators. We have the resources we need, but we have lacked the political and professional will to improve the system.

Health care report cards should follow basic rules of communication.

Quality Reporting on Quality

Once a system is in place to monitor the quality of care, the results need to be communicated in a way that is useful to consumers. Otherwise, providers will face little demand for improvement.

In the past decade, several “report cards” have been issued on the quality of care administered by hospitals, health plans, and physicians (see table). The purpose has been to stimulate quality improvement. The assumption is that health care providers will compete for the highest grades, because consumers who see the report cards will flock to the providers with the highest grades.

Unfortunately, consumers haven’t been convinced. Consumers, be they employers or individuals, rarely use the report cards to make decisions. Only a few employers even check accreditation data before buying corporate health plans. And only one study—of the New York reporting system on bypass surgery—has shown any significant effect of report cards on the decisions of individual patients. Similarly, few

physicians use the report cards to make patient referrals.

The good news is that hospitals seem to be using the report cards to improve their quality of care. But this good news may not last. Hospitals will improve their care either in response to consumer demand or out of fear that consumers will take their business elsewhere. If hospitals detect that consumers are indifferent to the report cards, then the hospitals may become indifferent as well.

We’ve examined how the information for report cards is gathered, why people don’t use them, and what could make them more useful. We suspect that the problem lies as much with the report cards themselves as with lackadaisical consumers or providers.

In 1998, we helped the “Big Three” U.S. automobile manufacturers and the United Auto Workers create a single reporting system to evaluate the health plans of autoworkers. Originally, two of these clients had created separate reporting systems, both of which had compiled data on quality of care, access to care, treatment outcome, and patient satisfaction. As far as we could tell, the gathering and organizing of the data had gone well.

However, when we reviewed how the data had been summarized into categories that compared health care providers, we discovered wide variations. Although each method of summarizing the data was valid, the different methods that used different criteria led to very different conclusions about the same data. When multiple report cards with conflicting information are issued in the same geographic area, they merely confuse the public and generate mistrust of the entire process.

Even when report cards are consistent, consumers cite other reasons for ignoring them. The report cards are often difficult to understand because of their technical nature or poor design. They are often irrelevant to the decisions at hand or unavailable when needed. There is often too much information with too little time to review it. And information furnished by health plans and providers is often considered untrustworthy anyway. In making health care decisions, consumers say they rely on anecdotal evidence from family and friends more than empirical evidence.

To increase the utility of report cards, they should follow some basic rules of communication:

- Provide a context—or a good reason why consumers should care about the information.

Most Report Cards Have Measured Local or Regional—Not National—Quality of Care^a

Organization	Quality Measurement	Reporting Entity	NOTES:
Hospital	Overall mortality	HCFA	HCFA: Health Care Financing Administration PBGH: Pacific Business Group on Health JCAHO: Joint Commission on the Accreditation of Healthcare Organizations NCQA: National Committee for Quality Assurance UAW: United Auto Workers ^a This list is not exhaustive but is illustrative of the efforts to date. SOURCE: "Public Release of Information on Quality," 2001.
	Mortality by specific procedure	State of New York State of Pennsylvania PBGH (California only)	
	Mortality by specific disease	California Hospital Outcomes Project Cleveland Quality Choice	
	Accreditation	JCAHO	
	Rankings by specialty area	<i>U.S. News & World Report</i>	
Health Plan	Process of care	NCQA	
	Patient experience with care	NCQA	
	Accreditation	NCQA	
	Categorical rankings	Combined Autos/UAW Reporting System <i>U.S. News & World Report</i>	
Medical Group	Process of care	PBGH (California only)	
	Patient experience with care	PBGH (California only)	
Physician	Mortality rate for coronary artery bypass graft surgery	State of New York State of Pennsylvania	

- Give top billing to the information that is most important to consumers.
- Organize the information hierarchically under clear headings and subheadings.
- Build redundancy into the presentation as a way to reinforce the message.

A national tracking system to assess the quality of care, therefore, will be a necessary but insufficient weapon to wage a war on poor quality. We also need a national strategy to communicate the results of the

assessments. Along with better report cards, we need to educate the public about them through the mass media, inform health professionals about them during their training and continuing education, and deliver pointed messages about them to providers. A coordinated communications strategy would decrease the likelihood of conflicting information and increase the likelihood that people will use the information to improve the quality of care. ■

Related Reading

Creating a Coordinated Autos/UAW Reporting System (CARS) for Evaluating Health Plan Performance, Elizabeth A. McGlynn, John Adams, Jennifer Hicks, David Klein, RAND/DRU-2123-FMC, 1999, 76 pp., no charge.

"Defining and Measuring Quality of Care: A Perspective from U.S. Researchers," *International Journal for Quality in Health Care*, Vol. 12, No. 4, 2000, pp. 281–295, Robert H. Brook, Elizabeth A. McGlynn, Paul Shekelle. Also available as RAND/RP-897, no charge.

Developing Health Plan Performance Reports: Responding to the BBA, Elizabeth A. McGlynn, John Adams, Jennifer Hicks, David Klein, RAND/DRU-2122-HCFA, 1999, 214 pp., no charge.

Dying to Know: Public Release of Information About Quality of Health Care, Martin Marshall, Paul Shekelle, Robert Brook, Sheila Leatherman, RAND/MR-1255, 2000, 137 pp., ISBN 0-8330-2891-X, \$25.00.

"Evaluating the Quality of Care," Elizabeth A. McGlynn, Robert H. Brook, and "Public Release of Information on Quality," Elizabeth A. McGlynn, John L. Adams, in Ronald M. Anderson, Thomas H. Rice, Gerald F. Kominski, eds., *Changing the U.S. Health Care System: Key Issues in Health Services, Policy and Management*, San Francisco, Calif.: Jossey-Bass, 2001.

"Keeping Quality on the Policy Agenda: How Many More People Have to Die Before We Accept That Quality Is Everyone's Problem?" *Health Affairs*, Vol. 20, No. 3, May/June 2001, pp. 82–90, Elizabeth A. McGlynn, Robert H. Brook.

"The Public Release of Performance Data: What Do We Expect to Gain? A Review of the Evidence," *Journal of the American Medical Association*, Vol. 283, No. 14, April 12, 2000, pp. 1866–1874, Martin N. Marshall, Paul G. Shekelle, Sheila Leatherman, Robert H. Brook. Also available as RAND/RP-907, no charge.

Quality of Care for Cardiopulmonary Conditions: A Review of the Literature and Quality Indicators, Eve A. Kerr, Steven M. Asch, Eric G. Hamilton, Elizabeth A. McGlynn, eds., RAND/MR-1282-AHRQ, 2000, 342 pp., ISBN 0-8330-2921-5, \$25.00.

Quality of Care for Children and Adolescents: A Review of Selected Clinical Conditions and Quality Indicators, Elizabeth A. McGlynn, Cheryl Damberg, Eve A. Kerr, Mark A. Schuster, eds., RAND/MR-1283-HCFA, 2000, 566 pp., ISBN 0-8330-2922-3, \$35.00.

Quality of Care for General Medical Conditions: A Review of the Literature and Quality Indicators, Eve A. Kerr, Steven M. Asch, Eric G. Hamilton, Elizabeth A. McGlynn, eds., RAND/MR-1280-AHRQ, 2000, 498 pp., ISBN 0-8330-2916-9, \$30.00.

Quality of Care for Oncologic Conditions and HIV: A Review of the Literature and Quality Indicators, Steven M. Asch, Eve A. Kerr, Eric G. Hamilton, Jennifer L. Reifel, Elizabeth A. McGlynn, eds., RAND/MR-1281-AHRQ, 2000, 294 pp., ISBN 0-8330-2920-7, \$25.00.

Quality of Care for Women: A Review of Selected Clinical Conditions and Quality Indicators, Elizabeth A. McGlynn, Eve A. Kerr, Cheryl Damberg, Steven M. Asch, eds., RAND/MR-1284-HCFA, 2000, 446 pp., ISBN 0-8330-2923-1, \$30.00.

SHIPSHAPE

A Reorganized Military for a New Global Role

By the end of summer, U.S. Secretary of Defense and former RAND Trustee Donald Rumsfeld could propose sweeping changes in U.S. defense policy. Under his stewardship, more than 20 Pentagon panels have been scrutinizing different aspects of that policy since February. By late September, a new defense strategy will be promulgated, along with the defense budget proposal for fiscal year 2003 and an outline of the defense plan for five years thereafter.

Underlying the current Pentagon reviews are fundamental questions about the military's role in the world today and the ability of military organizations to fulfill that role. RAND researchers have been grappling with these questions since the breakup of the Soviet Union in 1991. Since then, RAND has been trying to help the U.S. Department of Defense (1) define the roles that U.S. military power should play in the world and (2) outline the types of reorganization that U.S. forces should undergo internally so that they can successfully carry out the ambitious missions assigned to them. The ideas have figured prominently in some of the recent Pentagon reviews.

David Ochmanek, a RAND defense analyst, says the role of U.S. military forces goes far beyond fighting and winning the nation's wars. "U.S. forces during the cold war never fought 'the big one' against the Soviet Union," he explains, "but this does not mean that they failed to fulfill their purpose. Far from it: Deterring wars is generally a higher mark of success than winning them."

Others at RAND concur that U.S. forces should be ready to accomplish the full range of missions that might be required today, because that would be the best deterrent against being drawn into a major war. The full range of potential missions includes deterring and defeating

large-scale aggression, terrorist attacks, and attacks on the United States; preventing the use of weapons of mass destruction; protecting Americans abroad; projecting stability abroad in peacetime; conducting humanitarian operations; and countering the production and smuggling of illegal drugs.

The role of U.S. military power today, therefore, can be defined broadly: to protect and promote American and allied interests and values virtually anywhere in the world. Sometimes that role requires fighting wars; more often, it involves preventing wars. Whether the United States extends a security guarantee overseas, remains engaged in hot spots like the Middle East, enforces order in unruly places like Kosovo, or responds to humanitarian crises, the overarching goal is to promote the common interests and values of America and its allies.

To advance the national agenda in today's globalizing world, the United States typically must secure the cooperation of other international actors—national governments, international institutions, transnational entities, and subnational groups—in the pursuit of common objectives. "America's unique capability to project military power rapidly to distant regions is a distinct asset in building international coalitions to tackle common problems," says Ochmanek.

Most observers agree that future military success will depend on the ability of U.S. forces, allied forces, and other international partners to better integrate their operations for greater speed and effectiveness. In other words, success will depend on integration, and integration will require reorganization. RAND researchers have delineated some of the organizational changes that will be necessary. The most comprehensive recommenda-

tions available from RAND at this time pertain to four types of global reorganization that are currently under way: (1) the expeditionary aerospace force, (2) rapidly employable ground forces, (3) allied interoperability, and (4) coordinated humanitarian operations.

The Expeditionary Aerospace Force

Currently, the U.S. Air Force operates largely from permanent overseas bases that were inherited from the cold war. The bases are concentrated in the two regions of the world that were of greatest concern back then: Western Europe and Northeast Asia. Today, 13 of these bases remain. However, as shown in the map on page 14, the bases are located far from many of the highly unstable regions of the world today. Since 1990, these regions have sparked many major deployments, notably Operation Desert Storm, subsequent duties in the Persian Gulf, peacekeeping and humanitarian relief missions in Africa, and counternarcotics operations in Latin America.

These deployments have placed a heavy strain on the air force personnel stationed permanently at the overseas bases. To spread its burden more evenly among its squadrons, the air force began reorganizing into an Expeditionary Aerospace Force in 1998. The goal is to help the force respond quickly—ideally within 48 hours—to crises anywhere in the world without requiring even more personnel to reside permanently overseas.

In practice, the U.S. Air Force has divided itself into ten forces of roughly equal size, each containing fighters, bombers, tankers, and other supporting aircraft. At any given moment, two of these ten forces (called Aerospace Expeditionary Forces) are on call for 90 days at a time, available either to initiate overseas deployments or to fill in for current deployments. After 90 days, the rotating forces spend 12 months in routine training and exercises before going on call again. There are also two Aerospace Expeditionary Wings, which can provide tailored support to the rotating forces as necessary.

RAND researchers laud this reorganization but point to some remaining problems—and possible solutions. Above all, the Aerospace Expeditionary Forces still must manage an immense amount of global uncertainty, based as they are in just the United States and two clusters of overseas bases that were situated to contain the former Soviet Union. If the air force is to fulfill its mission of quickly projecting substantial power to austere and unanticipated locations anywhere in the world with sufficient resources for indefinite periods of time, then a new basing strategy will be needed. RAND researchers

have proposed a strategy that would rely on continuous access to a global network of overseas locations. The air force would maintain these locations for potential use as regional hubs on an as-needed basis. RAND researchers have dubbed this strategy “flexbasing.”

The flexbasing hubs could be allied military bases, international airports, or unused airfields. They would take advantage of host-nation funding and commercially available products and services. As illustrated in the map on page 15, these regional hubs would be the “forward support locations” (FSLs) that would vastly extend the global reach of C-17 cargo aircraft to a multitude of even farther-flung potential crisis zones.

Typically, Aerospace Expeditionary Forces would deploy from their permanent, main operating bases in the United States, Europe, or East Asia to relatively austere bases somewhere in a developing crisis zone. The FSLs would serve as the storage sites for each region’s anticipated requirements, such as munitions, spare parts, or humanitarian supplies. During operations, the FSLs might also serve as repair facilities or transportation hubs. Moreover, each of the U.S. military services, not just the air force, could use the FSLs for supplies, equipment, and shelter.

For the flexbasing strategy to work, two other changes are required. First, there need to be centralized planning and coordination of global logistics and transportation. Second, there needs to be more attention given to comprehensive protection of U.S. personnel deployed at all locations.

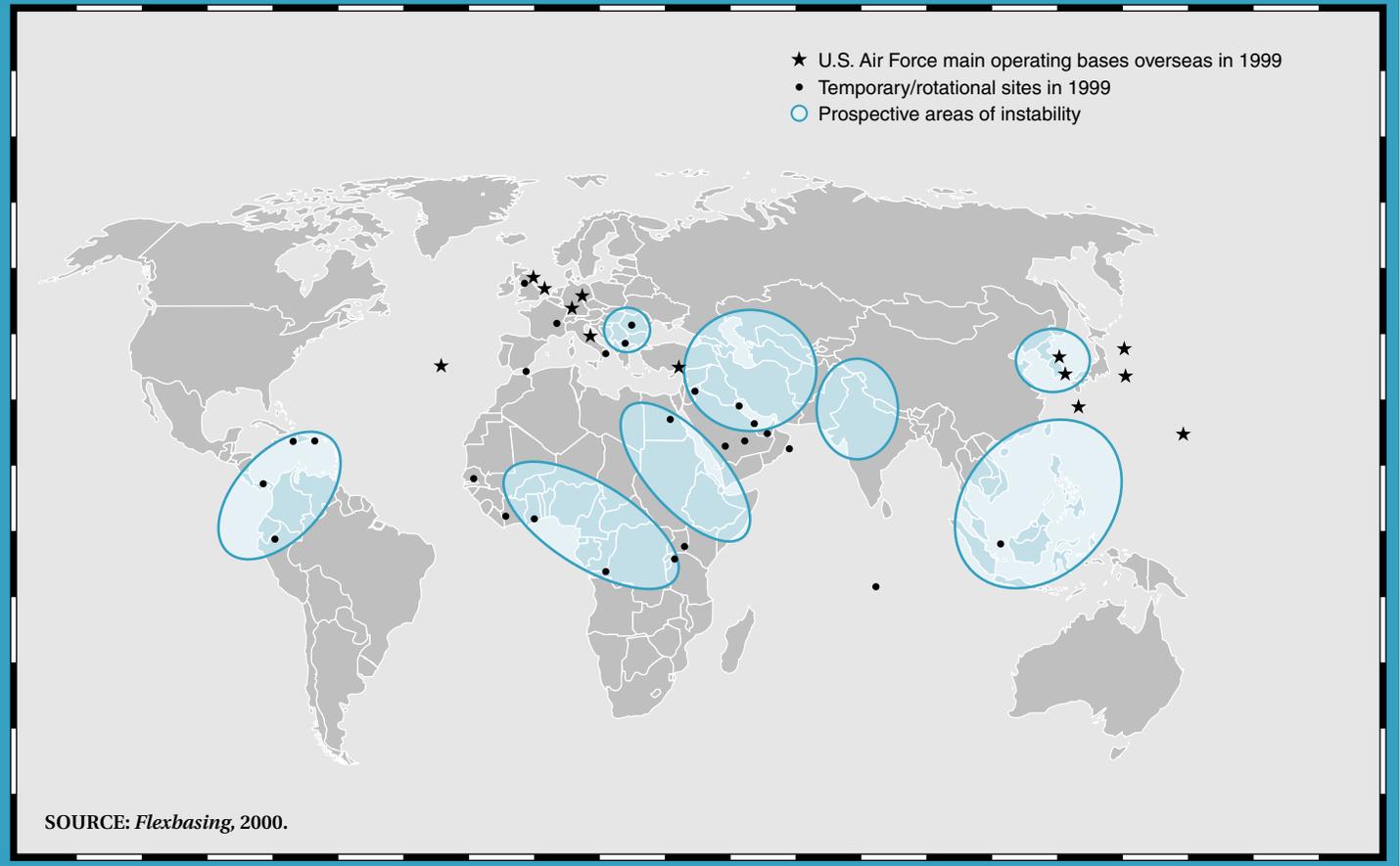
Centralized planning will be needed to ensure that each FSL in the entire global network remains accessible, equipped, and prepared. Centralized coordination is crucial for ensuring that resources can be moved both from FSLs to operating bases and *between* FSLs under rapidly changing circumstances. Yet even with centralized planning and coordination, current logistics

and transportation systems will not allow the air force to reach its stated goal of arriving anywhere in the world within 48 hours without prepositioning huge amounts of supplies and equipment at the far-flung forward operating locations.

RAND analyses reach a sobering conclusion: With today’s logistics and technologies, deploying even a

SUCCESS WILL DEPEND ON INTEGRATION, AND INTEGRATION WILL REQUIRE REORGANIZATION.

OVERSEAS BASES ARE MOSTLY IN THE WRONG PLACES



modest air force to a bare forward operating location (with just a runway, water supply, and fuel) would take at least a week. Although the 48-hour goal could be met by prepositioning supplies at such a location, the increased risk and cost might not justify the increased speed. One compromise would be to supply only those forward operating locations that are expected to be under the heaviest threat. Elsewhere in the world, where conflict is less likely or where humanitarian missions will be the norm, the prepositioned supplies could be relatively meager.

Regardless of the timelines involved, U.S. personnel deployed at all locations need to be able to detect and defeat a range of enemy attacks. Potential attacks could involve conventional weapons, ballistic missiles, cruise missiles, chemical or biological agents, and information warfare. An absence of capabilities to protect U.S. forces would limit their access to the operating locations and thus undermine the flexbasing strategy altogether.

Rapidly Employable Ground Forces

The 1999 war in Kosovo laid bare the limitations of relying on air power alone. Yet the war also showed the

inability of ground forces to act fast enough to thwart adversaries on short warning. To defeat an enemy invasion of a friendly region, the United States would benefit greatly if it could employ—within *days* rather than weeks—a joint force from air, land, and sea. The joint force would combine long-range fires—from aircraft, ships, and land-based missiles—with maneuvering ground forces equipped with attack helicopters and shorter-range fires. Such a joint force could be very useful for certain types of contingencies.

An early version of such a force is feasible within the next five years, even without heroic technological advances. However, military leaders need to (1) revise their prevailing strategies and doctrine that emphasize massive ground wars and (2) rethink how ground troops and equipment are currently prepositioned around the world.

Currently, few U.S. ground troops could arrive almost anywhere in the world within a few days. Other than very small groups of Special Operations Forces, the only U.S. ground troops that could arrive so quickly are perhaps a Marine Expeditionary Unit (MEU) and a ready brigade of

FLEXBASING COULD ALLOW A RAPID RESPONSE AROUND THE GLOBE



the army's 82nd Airborne Division (see figure on next page). An MEU, consisting of helicopters and a landing team stationed aboard an aircraft carrier, can arrive quickly—if the aircraft carrier is already deployed in a crisis region. Larger Marine Corps units, called Marine Expeditionary Brigades (MEBs), take at least a week to arrive and usually much longer. MEBs consist of a larger contingent of ground forces, some mechanized vehicles, helicopters, and air support from aircraft carriers. Although the equipment for MEBs is prepositioned aboard ships, the U.S. Marines themselves are airlifted to the ships to assemble the equipment and commence operations.

Similarly, the U.S. Army today prepositions its equipment aboard ships for large and highly capable mechanized brigades, but the soldiers could arrive only after a week or so under the best conditions. Two other kinds of army divisions face their own limitations. At one extreme, elements of the 82nd Airborne Division can be airlifted to crisis zones within a few days, but these paratroopers are not intended to operate for long on their own. They would not have enough trucks and jeeps to

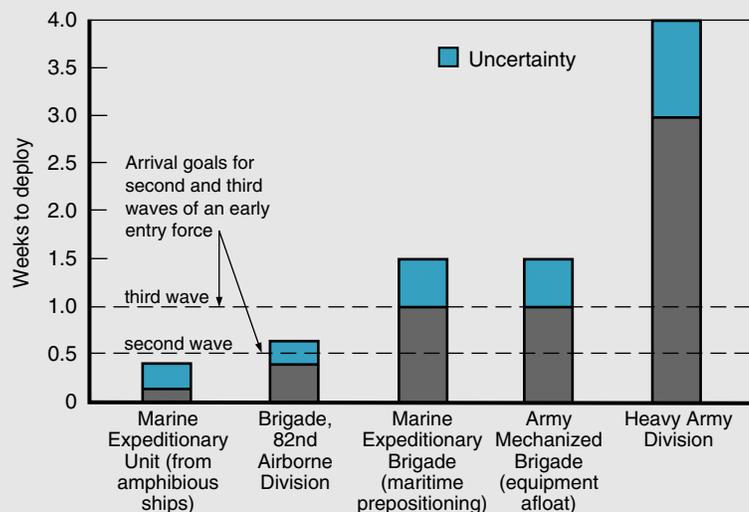
move around effectively. At the other extreme, today's heavy army divisions are simply too bulky to deploy quickly, requiring at least three weeks. A big part of the problem is that today's heavy army divisions were designed to fight a protracted ground war characteristic of the cold war.

RAND researchers propose that the U.S. Department of Defense rethink

- what kinds of missions might be assigned to future ground forces
- what kinds of modern equipment should therefore be prepositioned aboard ships
- what configurations of troops should therefore be airlifted to meet the equipment.

Time could be saved in three ways. First, the prepositioned ships could be deployed preemptively to a region of impending crisis—in the same way that the navy has maneuvered aircraft carriers for decades. Second, the storage of modern, lighter equipment aboard the ships could make any ensuing deployment much more agile. And third, smaller units of highly effective ground troops could be airlifted more rapidly to the

Currently, Few U.S. Ground Troops Could Arrive on Short Notice



SOURCE: *Ground Forces for a Rapidly Employable Joint Task Force, 2000.*

deploying ships. This early, “lightweight,” and nimble response could reduce the time required to deploy all ground forces to about a week. The overall plan envisions three distinct waves of ground troops.

Typically, the first wave would be an “allied-support force” of a few hundred U.S. personnel. This small, specialized force would link allied forces already in place to advanced U.S. systems for command and control, long-range fires, information, communications, surveillance, and reconnaissance. Using high-tech sensors and access to remote weapons, this initial force would gather intelligence and deny an encroaching enemy control of the terrain.

The second wave would be a “light mobile-infantry force” of 3,000–5,000 U.S. troops who would deploy about two days later. This force would resemble the army’s 82nd Airborne Division but with upgraded weapons, vehicles, and communications. Initially, this force would defend key positions and facilities; later, it might advance further forward, perhaps behind enemy lines, to direct long-range fires and to ambush the enemy.

The third wave, a “light (or medium-weight) mechanized force,” would arrive two to three days after the second wave, drawing equipment from the prepositioned ships. In the near future, this mechanized force would rely on the current generation of heavy tanks; in the longer run, the force would use the much lighter tanks and fighting vehicles that are now in development. The force would include 3,000–5,000 U.S. troops who would be capable of fighting the enemy’s armored vehicles and

armored forces, presuming those enemy forces had already been weakened by the long-range fires and ambushes conducted by the prior two waves of allied forces. Soldiers in the third wave would also field their own long-range missiles, shorter-range weapons, line-of-sight weapons, and attack helicopters.

All three waves would depend on agility, dispersal, networking, and precision fires. But none of the waves would depend on quantum leaps in speed and technology or require massive new procurements. Much could be accomplished within the next five years with the technologies already available or within reach. Reorganization is more essential than new technology. In the longer run, to be sure, the lighter mechanized forces would exploit technological advances, but waiting for those advances is not necessary. Moreover, the experience gained by a first version of such a force would be invaluable.

At the same time, funding would need to increase for some weapons, such as guided antitank missiles (which could hit tanks tens of miles away) and “loitering” missiles (which, in the longer term, could soar above the battlefield for half an hour or more). Improved information technologies would also be needed to safeguard the survival of dispersed troops by providing them with timely target locations and safer entry and exit routes. And, in the long term, air and ground robotic vehicles and unattended ground sensors would be unmanned to reduce casualties.

Additional changes would be required in military doctrine and training. Some of the concepts outlined here call for more U.S. forces to operate behind enemy lines and, in any case, to be much more dispersed and less dependent on large and vulnerable supply bases than in the past. Logistics might be provided largely from the sea. In training, U.S. units dispersed across army bases would need to link “virtually” so they could train while separated and learn to coordinate their actions before trying to do so in a distant land.

Allied Interoperability

Both the U.S. Army and U.S. Air Force want to improve the “interoperability” of their forces with those of the allies. Interoperability refers to the ability of different militaries to coordinate information, troops, and services so that they can operate together effectively. One obstacle to interoperability today is the technological gap between U.S. and allied forces. Perhaps an even greater obstacle is the organizational difficulty of managing multiple military organizations.

Among NATO armies, the technological disparity has less to do with weapons and hardware than with the information software systems of command, control, communications, computers, and intelligence. The U.S. Army is now “digitizing” the force in a way that could give everyone—from commanders down to individual soldiers—a computerized picture of battles as they unfold. The army’s modernization appears to be unmatched by the allied armies that are likely to deploy alongside it in the future. Some fear that the widening gap will only exacerbate current incompatibilities and undermine future coalition operations.

On the one hand, RAND researchers point out that technological incompatibilities among allied armies are nothing new. In the past, the allies have worked around their technological differences through tried-and-true methods that should continue to work in the future. These methods include geographic separation of national contingents, loans of sophisticated equipment to less sophisticated armies, phased deployments that send the most capable forces first, and preplanning by the allies to devise a strategy that minimizes their incompatibilities.

On the other hand, these methods can go only so far. In the long term, the U.S. Army should take the lead in eliminating the multiple root causes of allied army incompatibility, according to Michele Zanini, a RAND researcher and Italian national. He explains that the root causes are both technological and organizational. In fact, greater allied use of sophisticated technologies would not guarantee compatibility with U.S. forces. To work together, ground force coalitions should also learn how to use and operate similar equipment in a coordinated fashion. Therefore, the U.S. Army should push for these coordinated, long-term steps to improve interoperability:

- a common doctrine, or set of guidelines, for planning, executing, monitoring, and assessing coalition operations
- technological cooperation on research and development programs, especially for allied communications and information systems
- joint procurement of weapons systems and logistics equipment
- regular training exercises to coordinate multinational command posts
- improved planning within the U.S. Army itself to coordinate its own interoperability efforts.

Researchers studying the interoperability of allied air forces have reached similar conclusions. A RAND team led by policy analyst Myron Hura emphasized the

need to improve the organizational aspects of interoperability as well as the technical aspects.

Today, many European allies are upgrading their aircraft. However, unlike the Americans, the allies are focusing on peace operations and crisis response. The allies are investing little in U.S.-style advanced weapons systems, such as stealth aircraft, all-weather precision-guided bombs and missiles, and the improved targeting systems that are essential for conducting precision strikes during war while minimizing collateral damage and ensuring aircraft survivability.

Therefore, in a financially constrained environment, efforts to enhance allied interoperability in the air should emphasize non-materiel items. These items include common strategy and doctrine, common standards for sharing information, improved procedures for identifying friends and foes, and combined training of expert personnel. Efforts to enhance allied interoperability through hardware should be selective and focus primarily on compatible systems for command, control, communications, intelligence, surveillance, and reconnaissance. For example, tactical digital data links would be a major improvement over the allies’ current reliance on radio and voice communications networks.

The allied air forces have at least one opportunity to reorganize their weapons systems as well. A separate RAND study of potential allied air campaigns in the Persian Gulf found that the allied air forces could coordinate, if not replicate, their existing fleets of aircraft and other resources. In fact, inefficient duplication of resources should not necessarily be the goal. Rather, the allies could reorganize their resources into a functional division of labor.

Most NATO allies have complementary “niche” capabilities. The allies are strong in areas where the United States faces shortfalls—areas such as tactical reconnaissance and airborne early warning (for tracking enemy aircraft from a great distance). The allied air forces also contribute regional infrastructures, such as airfields and depots, which are crucial for projecting power beyond NATO.

Because the allies can make only limited contributions to an air campaign, the United States should encourage them to hone their niche capabilities. In short, the United States should concentrate on what it

**MOST NATO ALLIES
HAVE COMPLEMENTARY
“NICHE” CAPABILITIES.**

does best, and willing allies should do what they do best. This approach would not only exploit the comparative advantages of each country. It would also be politically sustainable, militarily feasible, and fiscally affordable for each country.

A functional division of labor could, for example, help ensure Western access to Persian Gulf oil. Among the European allies, Britain and France are the most committed to projecting military power abroad and protecting their interests outside Europe. Therefore, the United States should encourage these two countries to invest heavily in modernized forces.

Germany could contribute by moving troops and equipment to the Gulf, perhaps by earmarking part of the German civilian air fleet. Germany, Italy, and other allies could also supply aircraft for tactical reconnaissance, thus helping to compensate for U.S. shortfalls.

Many smaller members of NATO could contribute in smaller ways. Some Dutch, Danish, and

Belgian F-16 fighters have been modified for reconnaissance, while Poland flies the MiG-21R reconnaissance aircraft. The Dutch, Danes, Belgians, Norwegians, Canadians, and other allies possess impressive mine warfare capabilities that could help keep ports, shipping lanes, and the Strait of Hormuz open to Western forces. Collectively, the NATO allies have roughly 300 medium-range airlifters, compared with about 200 in the U.S. Air Force.

Because of their geographic location, southern members of the alliance—Spain, Portugal, Italy, Turkey, and Greece—would be the springboards for Gulf deployments. Rather than prodding these nations to modernize their fleets, the United States should seek to ensure their approvals for basing and overflight rights. Italy could also supply reconnaissance aircraft and airlift.

Two of the newest NATO members—Hungary and the Czech Republic—could pitch in with credible capabilities to detect and decontaminate nuclear, biological, and chemical weapons. These are areas where the United States and other allies are relatively unprepared.

Overall, this strategy of task specialization would be a realistic way for the allies to share the burden of collec-

Coordinated Humanitarian Operations

Since the end of the cold war, U.S. military forces have conducted humanitarian operations in Somalia, Rwanda, Bosnia, and Kosovo. Humanitarian operations pose extremely complex organizational challenges because they involve so many disparate actors: the armed forces, donor countries, host countries, international organizations, regional organizations, and nongovernmental organizations (NGOs). At times, everyone and no one may be in charge. The military mission might not be entirely clear. Military personnel may be compelled to improvise, or they may see their mission change in disconcerting ways.

U.S. military leaders could improve the coordination of humanitarian operations substantially, say political scientist Daniel Byman and others at RAND. At a minimum, military commanders should become familiar with the organizations that are most relevant to humanitarian operations. These organizations include United Nations agencies, the International Committee of the Red Cross, and important NGOs. Officers in the unified commands—such as the U.S. Central Command and U.S. Southern Command—should maintain regular contact with the key organizations in their areas of responsibility. Simultaneously, the leaders of the unified commands and armed services should inform relief agencies about the military's capabilities.

Military leaders should also bring officials of major relief agencies into the planning process. The agencies should be encouraged to develop relief packages that could be quickly deployed by military personnel, and the personnel should transport agency workers during crises as necessary. Closer ties between relief agencies and the armed forces would increase speed and efficiency throughout a crisis and would pay particular dividends at the beginning of a crisis, when delay can cost many lives.

Just as allied militaries can leverage their strengths in battle by training together and sharing information,

CLOSER TIES BETWEEN RELIEF AGENCIES AND THE ARMED FORCES WOULD PAY PARTICULAR DIVIDENDS AT THE BEGINNING OF A CRISIS.

the U.S. military services and the relief agencies can leverage their strengths in humanitarian operations by training together and sharing information. Training exercises for humanitarian operations should include relief agencies more extensively. And the military services should exchange information regularly with the agencies, minimize the classification of data that they need, share after-action reports with the agencies, and solicit their responses.

RAND researchers again propose a functional division of labor: The armed forces should coordinate relief efforts until the NGOs and U.N. agencies can arrive on the scene to take over the job. Only the U.S. Air Force can quickly conduct a massive airlift early in a crisis. The military services and unified commands also possess a logistics expertise often lacking among relief agencies. But once the initial capacity for providing relief is in place, the relief agencies would know better how to establish relief priorities.

Byman and his coauthors believe that Washington should place transatlantic cooperation in humanitarian crises high on the agenda of consultations between NATO and the European Union. The United States should try to take advantage of French facilities and European relationships in and around Africa to support relief operations there. And the United States should encourage representatives from European NGOs to enroll in relevant courses at U.S. and NATO war colleges.

U.S. military forces cannot manage all aspects of humanitarian operations. But military leaders can work on those aspects that fall within their sphere of responsibility. Within that sphere, military leaders can make considerable improvements and act as a catalyst for broader organizational reform. The recommendations proposed here would make future humanitarian operations run more smoothly and thereby mitigate the suffering caused by humanitarian crises. ■

Related Reading

Military Roles and Reorganization

"Getting the Quadrennial Defense Review Right," David Ochmanek, and "Transforming Military Forces," Paul K. Davis, in Frank Carlucci, Robert Hunter, and Zalmay Khalilzad, eds., *Taking Charge. Discussion Papers: A Bipartisan Report to the President-Elect on Foreign Policy and National Security/Transition 2001*, RAND/MR-1306/1-RC, 2001, 366 pp., ISBN 0-8330-2957-6, \$25.00.

Transforming U.S. Forces: Lessons from the Wider Revolution, David C. Gompert, Irving Lachow, RAND/IP-193, 2000, 12 pp., no charge.

The Expeditionary Aerospace Force

Flexbasing: Achieving Global Presence for Expeditionary Aerospace Forces, Paul S. Killingsworth, Lionel Galway, Eiichi Kamiya, Brian Nichiporuk, Timothy L. Ramey, Robert S. Tripp, James C. Wendt, RAND/MR-1113-AF, 2000, 119 pp., ISBN 0-8330-2777-8, \$15.00.

Supporting Expeditionary Aerospace Forces: A Concept for Evolving the Agile Combat Support/Mobility System of the Future, Robert S. Tripp, Lionel Galway, Timothy L. Ramey, Mahyar Amouzegar, Eric Peltz, RAND/MR-1179-AF, 2000, 49 pp., ISBN 0-8330-2852-9, \$8.00.

Supporting Expeditionary Aerospace Forces: An Analysis of F-15 Avionics Options, Eric Peltz, Hyman L. Shulman, Robert S. Tripp, Timothy Ramey, Randy King, John G. Drew, RAND/MR-1174-AF, 2000, 159 pp., ISBN 0-8330-2895-3, \$15.00.

Supporting Expeditionary Aerospace Forces: An Integrated Strategic Agile Combat Support Planning Framework, Robert S. Tripp, Lionel Galway, Paul S. Killingsworth, Eric Peltz, Timothy L. Ramey, John G. Drew, RAND/MR-1056-AF, 1999, 145 pp., ISBN 0-8330-2763-8, \$15.00.

Supporting Expeditionary Aerospace Forces: New Agile Combat Support Postures, Lionel Galway, Robert S. Tripp, Timothy L. Ramey, John G. Drew, RAND/MR-1075-AF, 2000, 66 pp., ISBN 0-8330-2801-4, \$7.50.

Rapidly Employable Ground Forces

Agility by a Different Measure: Creating a More Flexible U.S. Army, Thomas McNaughter, David Johnson, Jerry Sollinger, RAND/IP-195, 2000, 5 pp., no charge.

Ground Forces for a Rapidly Employable Joint Task Force: First-Week Capabilities for Short-Warning Conflicts, Eugene C. Gritton, Paul K. Davis, Randall Steeb, John Matsumura, RAND/MR-1152-OSD/A, 2000, 142 pp., ISBN 0-8330-2797-2, \$15.00.

Joint Operations Superiority in the 21st Century: Analytic Support to the 1998 Defense Science Board, John Matsumura, Randall Steeb, Ernest Isensee, Thomas Herbert, Scot Eisenhard, John Gordon, RAND/DB-260-A/OSD, 1999, 72 pp., ISBN 0-8330-2714-X, \$30.00.

Lightning over Water: Sharpening America's Light Forces for Rapid-Response Missions, John Matsumura, Randall Steeb, John Gordon, Tom Herbert, Russell Glenn, Paul Steinberg, RAND/MR-1196-A/OSD, 2000, 245 pp., ISBN 0-8330-2845-6, \$40.00.

Allied Interoperability

The Army and Multinational Force Compatibility, Michele Zanini, Jennifer M. Taw, RAND/MR-1154-A, 2000, 93 pp., ISBN 0-8330-2793-X, \$8.00.

Improving Army Planning for Future Multinational Coalition Operations, Thomas S. Szayna, Frances M. Lussier, Krista Magras, Olga Oliker, Michele Zanini, Robert D. Howe, RAND/MR-1291-A, 2001, 346 pp., ISBN 0-8330-2960-6, \$25.00.

Interoperability: A Continuing Challenge in Coalition Air Operations, Myron Hura, Gary McLeod, Eric Larson, James Schneider, Daniel Gonzales, Dan Norton, Jody Jacobs, Kevin O'Connell, William Little, Richard Mesic, Lewis Jamison, RAND/MR-1235-AF, 2000, 269 pp., ISBN 0-8330-2912-6, \$22.00.

Mind the Gap: Promoting a Transatlantic Revolution in Military Affairs, David C. Gompert, Richard L. Kugler, Martin C. Libicki, Institute for National Strategic Studies/National Defense University, Washington, D.C.: U.S. Government Printing Office, 1999.

Persian Gulf Security: Improving Allied Military Contributions, Richard Sokolsky, Stuart Johnson, F. Stephen Larrabee, eds., RAND/MR-1245-AF, 2000, 165 pp., ISBN 0-8330-2819-X, \$20.00.

Coordinated Humanitarian Operations

Strengthening the Partnership: Improving Military Coordination with Relief Agencies and Allies in Humanitarian Operations, Daniel Byman, Ian Lesser, Bruce Pirnie, Cheryl Benard, Matthew Waxman, RAND/MR-1185-AF, 2000, 260 pp., ISBN 0-8330-2868-5, \$18.00.

Power to the Cities

A Homegrown Way to Recharge California

By Mark Bernstein, Paul Dreyer, Mark Hanson, and Jonathan Kulick

The authors presented these findings to the California municipalities of Burbank, Glendale, and Pasadena, which sought to determine the likely value of their electricity generation to the state.

California's experiment with electricity restructuring began to fail last summer when wholesale electricity prices skyrocketed, partly because electricity supplies in the state had failed to keep pace with steadily growing demand. Since last summer, the state has endured power shortages and rolling blackouts. Today, rolling blackouts are a continuing threat, and power shortages have been projected through the winter of 2002 and possibly until 2004.

But there are signs of relief. Demand for electricity has waned this summer, thanks to statewide conservation efforts and cooperative weather. Meanwhile, supply has begun to wax with the opening of three new private power plants. Fortunately, there is an

additional way to increase supply that has received little attention to date: expanded power generation by the municipal utilities in the state that were never deregulated. Upgrading some of the municipal power plants with reasonably clean generators would help the state diversify its energy portfolio for the future.

About one-quarter of all electricity demand in California is still met by publicly owned utility companies. Three of these utilities—owned by the contiguous cities of Burbank, Glendale, and Pasadena—are planning to generate more of their own power as a way to insulate their residents, at least somewhat, from the turmoil that now plagues the deregulated market.

The three utilities enjoy a couple of unique advantages. First, the utilities could generate power near the source of demand—a strategy known as load-centered generation (LCG)—as opposed to relying on remote power plants. Second, the utilities already own and operate power plants on the land that they need. The utilities plan to replace their aging steam and combustion turbines with state-of-the-art, natural gas-fired generators. The new generators could allow the cities not only to meet their own needs but also to sell surplus power to the state at marginal cost. In return, the cities hope the state will help to finance the new plants and bring them quickly into service.

We examined the potential benefits to the state. The most persuasive argument in favor of the new plants is that they would help to reduce California's wholesale power costs by increasing the overall supply of electricity, promoting competition, and thus lowering prices. Under plausible conditions, the new municipal plants could save the state between \$467 million and \$585 million over ten years by providing electricity that the state might otherwise have to buy from wholesale markets at probably higher prices.

There would be other benefits as well. Because the power would be generated close to the consumers and transmitted along low-voltage distribution lines, it would reduce the strain on California's already overstressed transmission grid. Local consumers would be less vulnerable to distant natural disasters, transmission line failures, or other power losses along the grid. Californians generally would be less vulnerable to sudden power recalls by out-of-state generators. The locally owned generators, meanwhile, would keep a greater portion of capital and investment within the state and would raise state revenue through taxes and

An additional way to increase supply has received little attention to date.

employment. The new generators would also be much cleaner than the turbines that they would replace. Therefore, the utilities could save money on pollution permits, while the new power plants could be acceptable to an environmentally sensitive public.

For these reasons, LCG can become an important part of a balanced energy portfolio. Conceivably, investments in LCG could work for private plants as well as for public plants. For now, the benefits to the state seem attractive enough to encourage the publicly owned utilities in Burbank, Glendale, Pasadena, and elsewhere to proceed with LCG. For example, the state could

- offer financial incentives, such as low-interest loans, state-backed bonds, and long-term state contracts for LCG power
- streamline the approval process to bring LCG plants into service more rapidly
- guarantee state purchase of excess municipal supply.

Prospects for Local Power

Burbank, Glendale, and Pasadena combined can generate almost 600 megawatts of electricity today. However, much of this aging capacity can run only part time and can produce energy only during peak periods or emergencies.

The cities propose to build 12 new generators. Four of them would run nearly full time; eight would run during peak periods, mostly in winter and summer. The eight peak-period units could be in service by June 2002. They would be highly efficient gas turbines with a capacity of about 50 megawatts each. The four full-time units could be in service by June 2004. They would be larger gas turbines with a capacity of about 250 megawatts each. The 12 new units would have a total capacity of 1,400 megawatts (see table). One megawatt powers about 10,000 homes.

We estimated the future savings to the state under various conditions, including these:

- growth in electricity demand ranging from 1 to 4 percent per year
- wholesale electricity prices varying by 10 or 20 percent above or below the cost of generation
- natural gas prices ranging from \$2.50 to \$10 per million British thermal units (Btus)
- costs for nitrous oxide emissions permits ranging from \$5 to \$50 per pound.

A reasonable set of assumptions for the near future would put demand growth at 2 percent per year,



Downtown Glendale, Calif., appears in the foreground, as downtown Los Angeles looms in the southern distance. The cities of Los Angeles and Glendale own two of only four public utilities in the state that still control their own distribution systems. The other two utilities are the Burbank Public Service District and the Imperial Irrigation District.

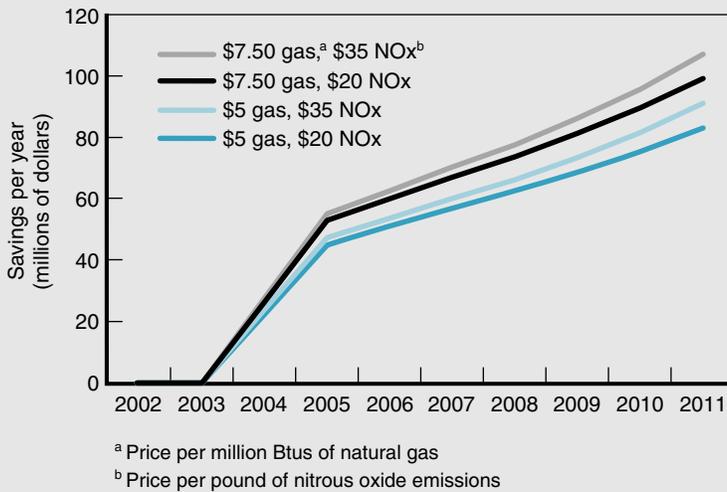
AP/WIDE WORLD PHOTOS/MARK J. TERRILL

wholesale electricity prices at cost, natural gas prices between \$5 and \$7.50 per million Btus, and the cost of emissions between \$20 and \$35 per pound. Under these assumptions, the new municipal power would save California between \$467 million and \$585 million over the ten-year period from 2002 through 2011. These savings translate to about \$5.30 to \$6.64 per megawatt-hour of new electricity generated. The savings would grow substantially from year to year, because little new generation is planned to come online in California after 2003.

Proposed Generators Would More Than Double the Output of Existing Generators		
City	Current Local Generation (total capacity)	Proposed Local Generation (total capacity)
Burbank	2 steam units 3 combustion turbines (161 megawatts)	2 GE 7FA units ^a (500 megawatts)
Glendale	2 combined cycle plants 3 steam units 2 gas turbines (250 megawatts)	1 GE 7FA unit 5 LM 6000 Sprint units ^b (500 megawatts)
Pasadena	3 steam units 2 combustion turbines (183 megawatts)	1 GE 7FA unit 3 LM 6000 Sprint units (400 megawatts)
Combined total	594 megawatts	1,400 megawatts

^a GE 7FA units are full-time gas turbines.
^b LM 6000 Sprint units are part-time gas turbines for peak periods.

Figure 1—Projected Annual Savings from New Municipal Generation



SOURCE: Bernstein et al., 2001.

Figure 1 shows how the savings would accrue each year under different assumptions.

We did not quantify the other benefits—such as increased reliability, tax revenue, or employment. We quantified savings from just two sources: (1) the lower electricity rates that municipal utilities expect to be able to charge, thanks to low-interest state loans, and (2) the avoidance of transmission losses over the statewide grid, which typically range from 2 to 5 percent of the power transmitted. We also used optimistic projections of the supply of new private generating capacity.

Our best estimates assume that demand for electricity will grow by 2 percent per year. We compared what the savings would be if demand were to grow instead at 1 percent or 4 percent annually. If demand were to grow by just 1 percent a year, the total savings could be as low as \$312 million. If demand were to grow by 4 percent a year, the savings would swell to \$1.5 billion over the ten-year period.

Beyond the Bottom Line

If load-centered generation were expanded into a statewide strategy beyond these three municipalities, it could offer California unique benefits in addition to the dollar savings. Today the state relies on large power plants that are located far from the customers served. Siting large plants in remote areas takes advantage of lower land costs and easier compliance with environmental regulations in rural areas compared with densely populated areas. But remote power plants also place a heavy burden on the transmission system. In contrast,

LCG relies on moderate-sized generating units close to the source of demand.

An enormous benefit of LCG would be reduced dependence on the transmission grid. Much of California's grid of 26,000 miles of transmission lines is under great strain. The grid is part of the 115,000-mile western grid that stretches from British Columbia to northern Mexico and links more than 700 power plants. Several major transmission corridors operate dangerously close to capacity, including the widely publicized Path 15 that links Northern and Southern California.

This past January, Northern California, which was unable to secure its standard supply of electricity from the drought-stricken hydroelectric plants of the Pacific Northwest, suffered rolling blackouts when excess capacity from Southern California could not squeeze through Path 15. An overstrained grid could jeopardize service at any point along the grid. In early April, for example, a windstorm knocked out a transmission line in the Northwest, depriving Los Angeles of 3,000 megawatts of capacity for ten days and causing a Stage 2 emergency.

By easing the strain on the grid, LCG would make the transmission lines less prone to failure and thus improve the reliability of power everywhere. LCG would prevent power outages both *inside* the local service area by insulating it from failures anywhere on the grid and *outside* the service area by improving the reliability of the grid as a whole. LCG would also allow the state to defer costly investments in transmission lines.

There may or may not be unique costs of LCG. Urban areas have higher land, operating, and maintenance costs than rural areas; however, these costs would not be a huge issue for an urban site that is already owned, operated, and maintained by a municipal utility. The smaller generating units proposed might cost more per megawatt produced than larger units; however, the smaller units might also allow for gradual expansion to match demand, reducing the upfront costs of industrial expansion. Pollution permits may be more expensive in urban areas because of the possible health and environmental impacts on larger populations; however, cleaner plants would need to purchase fewer permits for the same amount of power generated.

LCG cannot be the answer to all of California's energy problems. For example, power shortages may bedevil the regions where LCG is least likely to be an option. Or a natural disaster could knock out a municipal

utility and thus render its customers as dependent as ever on remote power. No matter what, the state needs to upgrade its transmission grid. But LCG is one of several strategies that the state should pursue.

Not Always a Welcoming Environment

New LCG power plants would not be immune to environmental disputes. Before any plants can be approved, they must satisfy the provisions of the Warren-Alquist Act and the California Environmental Quality Act. Issues examined during these yearlong proceedings include public health and safety, air and water quality, hazardous materials, environmental impacts, land use, and engineering design. The laws require staff analysis as well as public participation.

California Governor Gray Davis has declared the construction of more power plants to be a top priority during the current energy crisis. He has issued several executive orders intended to boost generation in the state and to streamline the approval process. Yet neighborhood concerns about air pollution and health have been voiced vigorously in recent public hearings on power plants.

Despite strict environmental standards and the approval from relevant authorities, at least one proposed power plant has been nixed by neighborhood activism: the Nueva Azalea plant in South Gate. In contrast, the Metcalf Energy Center, which is proposed for south San Jose and now under review by the California Energy Commission, has been welcomed by many of its neighbors, even on environmental grounds. These two cases illustrate the range of uncertainties involved in gaining approval for new power plants.

When Sunlaw Energy Company proposed the South Gate facility, the company promised \$1 million in neighborhood improvements, \$150,000 per year in community scholarships, and \$6 million in annual tax revenue to the city. Opponents conceded that the plant probably would have emitted less air pollution than the diesel truck depot it would have replaced. The South Coast Air Quality Management District gave the project preliminary approval. Yet claims of “environmental racism” in the predominantly Latino working-class community, plus a hunger strike by the mayor of South Gate, led Sunlaw to withdraw its plans.

Metcalf Energy Center has also met with opposition. Cisco Systems Incorporated and the mayor of San Jose complain about the possible health and safety effects, particularly on workers at a neighboring office

complex that is proposed for 20,000 Cisco employees. However, the board of the Silicon Valley Manufacturing Group supports the project, as do local chapters of the Sierra Club, the American Lung Association, and the state’s mainstream environmental groups. Much of the support stems from the fact that the plant would be much cleaner than existing plants.

The new power plants proposed for Burbank, Glendale, and Pasadena would be much cleaner than the plants now operating in those cities. Many of the existing turbines are 25 to 50 years old, have poor fuel efficiency, and pollute heavily. Figure 2 compares the average nitrous oxide emissions from the proposed generators with the average emissions from the existing generators.

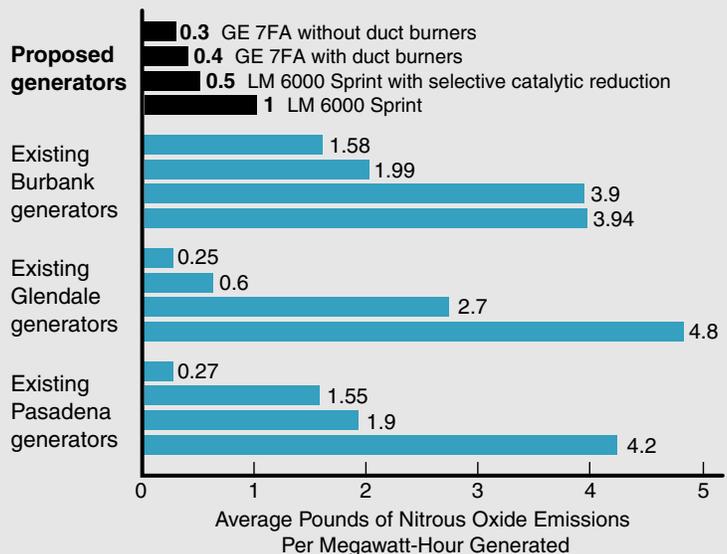
LCG holds great promise for California. We studied only three of the state’s municipally owned utilities, but it is fair to assume that municipal utilities across the state could generate thousands of megawatts of new, inexpensive, and clean electricity. State leaders should encourage cities to explore this new kind of public power as one component of a prudent energy strategy. ■

An enormous benefit would be reduced dependence on the transmission grid.

Related Reading

Load-Centered Power Generation in Burbank, Glendale, and Pasadena: Potential Benefits for the Cities and for California, Mark Bernstein, Paul Dreyer, Mark Hanson, Jonathan Kulick, RAND/IP-214-BGP, 2001, 14 pp., no charge.

Figure 2—Emissions from New Generators Would Be Relatively Minimal



SOURCE: Bernstein et al., 2001.

RAND REVIEW

Editor-in-Chief

John Godges

Assistant Editor

Christina Pitcher

News Editor

Brett Grodeck

Proofreader

Miriam Polon

Art Director

Ronald Miller

Designer

Peter Soriano

Production Editor

Christopher Kelly

Circulation

Christine Troncoso

Editorial Board

Dominic Brewer

David Chu

Paul Davis

Jerrold Green

Bruce Hoffman

James Hosek

James Kahan

Iao Katagiri

Kevin McCarthy

Elizabeth McGlynn

C. Richard Neu

Mary Vaiana

Recent reports identified in this issue may be purchased from RAND's Distribution Services, 1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138. To place credit card orders, telephone toll free (877) 584-8642; send a fax to (310) 451-6915; or send email to order@rand.org. National Book Network (NBN) carries selected RAND titles. Contact NBN at (800) 462-6420 to determine availability. Selected bibliographies of current research are available at no charge. Abstracts of RAND documents are available for review at www.rand.org/Abstracts

The RAND Policy Circle

Discretionary support for RAND research is provided by membership contributions to the RAND Policy Circle. Members of the RAND Policy Circle are invited to participate in seminars featuring top analysts and special guests who discuss their latest research on current public policy and social issues. To learn how to participate in the RAND Policy Circle, contact James W. Osterholt, executive director of development, at (310) 393-0411, ext. 7098.

RAND is a nonprofit institution that helps improve policy and decision-making through research and analysis. Chartered in 1948, RAND carries out its mission through contracts and grants from government agencies, foundations, and corporations worldwide, as well as with its own funds and gifts from individuals. RAND also operates the RAND Graduate School.

RAND Board of Trustees

Ronald L. Olson, *chairman*

Ann McLaughlin Korologos,
vice chairman

Peter S. Bing

Frank C. Carlucci

Lovida H. Coleman, Jr.

Pedro Jose Greer, Jr.

Rita E. Hauser

Karen Elliott House

Jen-Hsun Huang

Bruce Karatz

Philip Lader

Lloyd N. Morrisett

Amy B. Pascal

Patricia Salas Pineda

John Edward Porter

John S. Reed

Donald B. Rice

Kenneth I. Shine

Jerry I. Speyer

James A. Thomson

James Q. Wilson

RAND Offices

Corporate Headquarters
1700 Main Street
P.O. Box 2138
Santa Monica, CA 90407-2138

Washington Office
1200 South Hayes Street
Arlington, VA 22202-5050

Pittsburgh Office
201 North Craig Street, Suite 102
Pittsburgh, PA 15213-1516

New York Office
215 Lexington Avenue, 21st Floor
New York, NY 10016-6023

Leiden Office
Newtonweg 1
2333 CP Leiden
The Netherlands

Berlin Office
Uhlandstrasse 14
10623 Berlin
Germany

Cambridge Office
36 Regent Street
Cambridge CB2 1DB
United Kingdom

CP-22-0108

RAND

1700 Main Street, PO Box 2138, Santa Monica, CA 90407-2138

NON-PROFIT ORG.
U.S. POSTAGE
PAID
THE RAND
CORPORATION