

The Army's Organic Industrial Base: What is the Future for Depots and Arsenals?



SUMMARY

It may come as a surprise to many Americans that the U.S. Army owns — and in some cases operates — a number of industrial facilities employing nearly 20,000 people. Largely a legacy of World War II, this industrial base includes several manufacturing arsenals that date back more than a hundred years. The number of these industrial facilities has declined dramatically over the last few decades, beginning with the end of the war in Vietnam and culminating with the last official round of base closures in 1995.

The remaining elements of this industrial base — often referred to as the “organic base” — consist of an assortment of arsenals, maintenance depots and ammunition factories. They are operated, funded and modernized as one of the Army’s core activities, and governed by a series of legislative provisions beginning with the 1920 Arsenal Act.

Despite recent success in business management, such as adopting commercial practices and bringing in new tenants through partnerships with private companies, critics argue that by almost all accepted commercial standards these Army plants maintain too much capacity, inefficiency and overhead. Some argue for the wholesale privatization of the public base, turning over industrial functions entirely to the commercial marketplace where inefficiencies would soon be eliminated. This seems particularly attractive during periods when spending on weapons systems is stagnant or declining, putting public facilities in direct competition with private companies for scarce business.

The debate on the proper sizing and most efficient manner of operating the public facilities has been going on for decades. It involves a complex set of tradeoffs with implications that reach into the heart of America’s ability to equip, sustain and support troops in contingency operations and times of war, mobilization and surge; implications that are not always apparent in peacetime. Many common criticisms of the organic base do not account for the unique requirements of operating military installations during war. Operations in Afghanistan and Iraq have tested the limits of some sectors of the commercial defense base and highlighted the value of the flexibility, responsiveness and dedication inherent in the organic base. These operations

have also revealed the extent to which the Army’s organic base has already evolved to suit the needs of a military operating in a new strategic environment, where maintenance, repair and upgrades are needed in real-time, in the theater of war.

The Defense Department, Congress and communities around the nation are preparing to debate the 2005 round of base closures (the Defense Secretary is required to submit a list of proposed closings to Congress in March 2005) that may include any of these Army industrial facilities. In this discussion over jobs, over-capacity and competition for defense resources, the overall objective of defining and preserving an *industrial capability necessary for national defense* must remain paramount.

The answer will not be found in black and white: private vs. public, arsenal vs. depot, over-capacity vs. efficiency, but rather in the continued evolution of the nation’s industrial base toward an integration that balances the best of what commercial companies and Army installations have to offer. Partnerships between the public and private sector need to be expanded and encouraged to an extent that transforms both elements. This will not be an easy task. It will require a shift in thinking among industrial managers — both public and private, and policy makers as well as legislators. The business environment must allow a genuine balance between the interests of the partners, so that both sectors see tangible, long-term benefits from the relationship.

The advantages of industrial partnerships have already been proven in several cases where they have been tried, but more needs to be done to encourage such arrangements. Congress has helped to create a more hospitable atmosphere for partnering over the past decade by passing legislation removing some barriers to long-term business relationships between the government and private companies. Other obstacles remain, however, including an overall reluctance to change, and most importantly, share work.

The continuing viability of the organic base, and ultimately the effectiveness of America’s defense industrial base as a whole, may well depend on whether these obstacles can be overcome. This is a challenge of transformation no less difficult and no less important than any other challenge facing the Army today.



Ground vehicle repair at Letterkenny Army Depot.

■ EVOLUTION OF THE ARMY “ORGANIC” BASE

The existence of an Army-owned manufacturing base is as old as the Army itself. When Congress created the Continental Army — the nation’s first professional military — there was no commercial industrial base to arm the force. To meet its new need for small arms, artillery and ammunition, the Army created its own sources. Emerging as it did out of the unique circumstances of America’s earliest days, this link between the Army and its in-house or “organic” industry is strongly engrained in the nation’s military culture.¹

THE 19TH AND EARLY 20TH CENTURIES.

The organic industrial base slowly expanded over the decades following independence. The oldest arsenal

still operating today — Watervliet — was established in 1813, primarily to manufacture the small articles supporting artillery, such as drag ropes, sponges, rammers and shot. By 1840 there were 22 arsenals supplying the U.S. Army with small arms and ammunition, and assembling and repairing artillery.

Meanwhile, a small private arms industry had begun to develop, encouraged by appropriations for long-term contracts that Congress began authorizing in 1808. This combination of public and private industries supplied the Army during the Mexican-American War, and for the first time American military units were adequately supplied with guns and ammunition during wartime.

In the latter decades of the 19th century a more robust commercial armaments base began to develop based on ongoing projects in ship building and coastal defenses. Army ordnance production and design, however, remained concentrated in the public arsenals, with the increasingly active support of the Congress. Army attempts to broaden sources of ordnance prior to World War I were blocked by legislation in 1915 and 1916. This concentration continued through the inter-war period, with what little activity there was taking place entirely at the Army's arsenals and proving grounds.²

EMERGENCE OF THE MODERN ORGANIC BASE.

The mobilization of the American industry during World War II is legendary. In a few short years the United States equipped an Army of more than 8 million men, and manufactured 96,000 tanks, 78 billion rounds of small-arms ammunition and nearly 7 million tons of aircraft bombs. This massive effort yielded a strong new relationship between the Army and commercial industry at the same time as the Army's organic base was rapidly expanding.

One of the most notable results was the creation of a hybrid form of production designed to capture the strengths of both the commercial and organic bases: the government-owned, contractor-operated (GOCO) facility. There were 77 of these GOCOs in 26 states by 1942. Another was the emergence of large-scale maintenance depots where Army combat systems were maintained, repaired and upgraded. These, like the arsenals, were government-owned, government-operated (GOGO).

During the 1960s and 1970s — after the end of the Korean War and as the Vietnam War wound down — the Army's organic base gradually declined. In 1967 the nation's oldest manufacturing arsenal, the Springfield Armory, closed, followed within a decade by three others. By the mid-1970s, only 25 of the GOGOs and 10 maintenance depots remained.



Tank repair line at Anniston Army Depot.

THE ORGANIC BASE TODAY.

The end of the Cold War and the accompanying rapid decline in defense spending left America with a defense industrial base far too large for its needs. Soon commercial defense companies were well on their way to a massive rationalization of the private sector, including a rash of mergers and acquisitions that concentrated defense business within a much smaller universe. But the organic base was bound by tradition, politics, and legislation; the Department of Defense (DoD) found it impossible to close excess facilities of any kind, including industrial.³

Nevertheless, something clearly had to be done. Congress and the Defense Department found the answer in the base closure and realignment (BRAC) process, a complex interaction between DoD, Congress, and an independent commission charged with making final closure and realignment recommendations.⁴

THE ARMY-OWNED INDUSTRIAL BASE		
GOVERNMENT-OWNED, GOVERNMENT-OPERATED		
DEPOTS	ARSENALS	AMMUNITION PLANTS/DEPOTS
Anniston (AL)	Rock Island Arsenal (IL)	McAlester Army Ammunition Activity (OK)
Letterkenny (PA)	Watervliet Arsenal (NY)	Red River Munitions Center (TX)
Corpus Christi (TX)	Pine Bluff Arsenal (AR)	Letterkenny Munitions Center (PA)
Red River (TX)		Anniston Munitions Center (AL)
Tobyhanna (PA)		Crane Army Ammunition Activity (IN)
Sierra (CA)		Hawthorne Army Depot (NV)
Tooele (UT)		
Blue Grass (KY)		
GOVERNMENT-OWNED, CONTRACTOR-OPERATED		
DEPOTS	ARSENALS	AMMUNITION PLANTS/DEPOTS
	Joint Systems Manufacturing Center (OH)	Lone Star Army Ammunition Plant(TX)
		Milan Army Ammunition Plant(TN)
		Iowa Army Ammunition Plant
		Riverbank Army Ammunition Plant(CA)
		Mississippi Army Ammunition Plant
		Radford Army (VA)
		Lake City Army Ammunition Plant (MO)
		Kansas Army Ammunition Plant
		Scranton Army Ammunition Plant (PA)
		Louisiana Army Ammunition Plant
		Holston Army Ammunition Plant (TN)

Four rounds of BRAC closures and realignments — in 1988, 1991, 1993 and 1995 — have yielded today’s organic industrial base. These facilities are listed in the table above, according to categories assigned by the Army for budgeting purposes.

The other military services also have some organic industrial capability, but the Army’s is the largest and most complex.⁵ Due to the range of capabilities that cut across so many technology areas and industrial processes, most of the Army depots do work for other Services to varying degrees. For example, Tobyhanna does all of the Air Force’s ground-based communications and electronics repair. Letterkenny supports ground and air missile systems for the Navy, Air Force and Army. Anniston supports Marine Corps tracked vehicles.

None of the other services have arsenals or GOCOs, each of which is treated differently than depots and shipyards when it comes to legislation, planning, budgeting and acquisition regulation. This distinction — particularly in the case of depots and arsenals — is a continuing source of difficulty for Army managers. The table highlights in yellow the facilities that are the focus of our discussion — those that engage in “depot level maintenance,” and major manufacturing of non-ammunition items. The ammunition base itself is the subject of a separate Lexington Institute White Paper.⁶

■ LAWS GOVERNING DEPOTS AND ARSENALS

A series of acts and amendments to procurement law over the last 85 years governs the organic industrial base today. The following four are among the most important:

The Arsenal Act (1920).

Intended by Congress to keep the public arsenals thriving, this act requires the Secretary of the Army to have “supplies needed by the Department of the Army” made in arsenals so long as the manufacturing is on “an economical basis.” This law applies only to the Army, and only to arsenals and factories. The entire statute is only six lines long, and has been subject to numerous interpretations over the years. There is still debate on whether depots are considered to be “factories” under this act. (10 U.S.C. 4532)

Core Logistics (1984).

This statute requires DoD to maintain a “core” organic industrial capability to provide depot-level maintenance and repair. “Core” is defined in the law as “capabilities that are necessary to maintain and repair the weapon systems and other military equipment...that are identified by the Secretary, in consultation with the Chairman of the Joint Chiefs of Staff, as necessary to enable the armed forces to fulfill the strategic and contingency plans...” (10 U.S.C. 2464)

Limitation on the Performance of Depot-Level Maintenance of Materiel (The 50/50 Rule) (1988).

Under this law, at least 50 percent of funds appropriated for “depot-level maintenance and repair” in any fiscal year must be performed by employees of the federal government. Prior to the 1997 amendment the requirement was 60 percent. (10 U.S.C. 2466)

Definition of Depot-Level Maintenance and Repair (1997).

This amendment to procurement law made clear that the definition of “depot-level” activities is not limited by source of funds or by location of the work. It is defined as “material maintenance or repair requiring the overhaul, upgrading, or rebuilding of parts, assemblies, or subassemblies...”⁷ (10 U.S.C. 2460)

Taken together, these laws indicate a long-standing and consistent effort by Congress to sustain an organic national defense industrial base of significant capability. Legislators have consistently supported the Army’s view that this base is unique; that it provides services and goods different from commercial industry, and that it deserves protection. Broad definitions of the requirements, along with a guaranteed workload, appear to support this goal even at the expense of competition and potential savings.

But the story of legislative support for a strong organic base does not stop with protective measures. In the last decade or so, and especially since the 1995 BRAC, a new series of legislation has been enacted to enhance the vitality of the organic base. These changes have enabled unprecedented cooperation between the public and private industrial bases, and in the process enhanced the effectiveness and efficiency of both.



Aircraft repair at Corpus Christi Army Depot.

KEY EXAMPLES INCLUDE:

Working Capital Funds (Subcontracting) (1991).

Allows facilities in the organic base to sell products or services to the private sector. (10 U.S.C. 2208(j))

Authority to Sell Outside the Department of Defense (1993).

Permits depots and arsenals involved in the manufacture of certain items⁸ to sell them outside the Department of Defense. The proceeds from such sales are returned to the Working Capital Fund rather than to the facility that made the sale. (10 U.S.C. 4543)

Centers of Industrial and Technical Excellence (CITE Statute) (1997).

Grants authority to depots now designated “centers of industrial and technical excellence” (CITE) in their respective core competencies, to enter into partnerships with private industry. These partnerships offer unprecedented flexibility to the depots to perform subcontract work for private industry (and possibly vice versa), and for private companies to use facilities or equipment at the depots for either military or commercial purposes. (10 U.S.C. 2474)

Enhanced Use Leases (2000).

Creates incentives for both organic facilities and the private sector to negotiate long-term leases of public property in return for cash or in-kind investments in the facilities. (10 U.S.C. 2667)

Arsenal Support Program Initiative (2001).

Permits arsenals to enter into cooperative agreements with private companies, in which the company may use arsenal facilities and/or equipment in exchange for investing in the maintenance or upgrade of arsenal property. Through annual



Pennsylvania National Guard operations in Afghanistan.

appropriations, Congress provides funds for arsenals to renovate or adapt their unused facilities for potential users. (Public Law 106-398, Section 343)

Cooperative Activities Pilot Program (2004).

Authorizes all Army industrial facilities (arsenals, ammunition plants, depots or “a manufacturing plant”) to enter into a variety of cooperative arrangements with “non-Army” entities. Cooperation can include direct sales or subcontracting by the Army facility, work share arrangements, and teaming to jointly bid on new federal contracts. The pilot program provides additional flexibility by allowing the Army facilities to enter into fixed-price and multi-year contracts to deliver goods and services, and allow the non-Army entity to make incremental and in-kind payments. This statute does not include any provisions for accounting for the proceeds of any of these cooperative arrangements. (10 U.S.C. 4544)

■ THE COMPLICATIONS OF WAR

Strong Congressional support for maintaining the organic base and the introduction of these more flexible business practices did provide for a fair degree of stability in the Army's industrial base during a time of turbulent restructuring within private industry. But, until September 11, 2001, downsizing and transforming the military were still the dominant themes, and most of the industrial policy and legislative initiatives of the 1990s were focused on reducing and reorienting the organic base to make it more efficient in the face of significantly reduced demand.

By the time of the September 2001 attacks, Army depots had reduced capacity by more than half since the beginning of the BRAC process, and were at 82 percent utilization. Furthermore, capabilities were consolidated so that all repair and overhauls of similar equipment were concentrated in one location.⁹ Initially, the relatively limited scope of operations in Afghanistan suggested few new implications for the organic base. But this quickly changed with the war in Iraq and growing understanding of the long-term nature and intensity of the Global War on Terror. The new national security imperatives have changed the business and political environments and raised questions about *efficiency versus effectiveness*.

Since late 2001, the workload at Army depots and arsenals has grown by 25 to 40 percent, creating a new set of challenges. Additionally, the depot workload began to include a significant role in retrofitting equipment required by deploying troops. In many cases adding work shifts has provided the additional volume of production required where stockpiles were low and demand unexpectedly high, for example, small-arms ammunition and light illumination rounds.

In other cases, simple volume has not been the problem. Instead, for a few highly critical items such as M2 .50 caliber machine guns and armored HMMWVs, the

Army had little or no production capability left after the downsizings of the 1990s. In both these examples, Army industrial managers have scrambled to accommodate unanticipated and urgent requirements from the field.

- The M2 machine gun went out of production in the 1970s, and by the early 1990s the capability to manufacture the machine gun barrel had virtually disappeared from the American industrial base. In addition to the modest complement of guns assigned to active and reserve components, the Army kept an inventory of 13,000 "unserviceable" guns that required some level of repair or maintenance before they could be used. Until recently, there were no plans to address this unserviceable stockpile. But when the Army identified a requirement for an additional 8,000 M2s,¹⁰ the Anniston Depot quickly expanded its very small existing repair capability to process as many M2s as possible without new parts. During the summer of 2004, Anniston began to repair M2s at the rate of 100 per month, with plans to ramp up to 700 per month by early 2005, once new barrels and other parts become available from the private sector.

- Like machine guns, the demand for armored HMMWVs by units in Iraq was unexpected. Meeting the demands has posed a multi-layered challenge for both the organic and private industrial bases. The initial requirement in the forward area was for 600 up-armored vehicles — a special version of the HMMWV produced by one private company at a rate of about 15 per month. When the requirement for up-armored vehicles in theater escalated to more than 8,000, the company was able to bring its production up to 450 per month.

Meanwhile, another urgent requirement emerged for armoring other versions of the HMMWVs in Iraq. Steel purchased from private companies was sent to two arsenals, a GOGO ammunition plant and three depots. At these facilities the steel has been made into



armor plates and assembled into kits, then sent on to the theater where they are applied to vehicles by depot teams.

Finally, with all these vehicles in a combat theater where they face constant and often harsh use, requirements for depot-level maintenance, repair and upgrades has increased dramatically. After the 1995 BRAC directed all Army wheeled vehicle repair to be concentrated at the Red River Depot as a matter of efficiency, the repair line at Letterkenny Depot was shut down. But the equipment at Letterkenny remained, and several years ago the depot began to work on small batches of specialized vehicles for non-Army military customers. Fortunately, this small capability at Letterkenny now provides a base for that depot to join Red River as they ramp up to overhaul an anticipated 4,600 HMMWVs in 2005, compared to a baseline of 200 just two years ago.

Tank repair at Anniston Army Depot.

- Depots also played a major role in improving command and control capabilities for American warfighters. As the start of Operation Iraqi Freedom (OIF) approached, teams of civilian technicians from Tobyhanna Army Depot rushed to install the latest technology into HMMWVs and other vehicles around the globe. Blue Force Tracking (BFT) kits would guide units through blinding sandstorms and emerge as one of the technological superstars of the war. With BFT's communications network, commanders and troops received near real-time data on their locations, the location of allied forces, and the location of enemies — thus enhancing situational awareness and reducing “friendly fire” incidents.

One of the operational surprises of OIF has been the intensity of the threat from enemy mortar fire. In order to support the resulting, but unanticipated, requirements from the theater, Tobyhanna has also completely reorganized its capability to repair the Fire Finder radar. This is a 1970s vintage system that detects incoming mortar rounds. Before OIF about 10 radars a year went through the depot; in 2004 it will be close to 80.

One of the most important lessons learned from the industrial response to the war in Iraq is that the “depot” is not a site but rather a capability. The geographic home of each Army depot now provides a base for the deployment of the depot’s capability to the operational theater where it is urgently needed, often located directly with combat units. This experience in turn serves as an incubator for the skills required by each depot.

This trend toward an “expeditionary” depot capability has developed most fully in the case of ground systems

and communications and electronics system support. Tobyhanna Army Depot has nine communications and electronics support activities in Iraq and two in Afghanistan; this is in addition to their 16 other forward-deployed satellite locations throughout the world. These depot employees work directly with combat units to maintain critical systems such as Fire Finder and secure communications gear.

Most of the in-theater work on ground systems, including the armoring of HMMWVs, is being done by forward-deployed depot personnel. For example, there are five HMMWV service centers in Iraq, where all levels of maintenance and repair are available on an as-needed basis. These centers represent an innovative way to meet the immediate needs of operational units without red tape or delay.

In another innovation, the Army Materiel Command has sent a “Mobile Parts Hospital” or Rapid Manufacturing System (RMS) to Kuwait for forward repair support in Iraq. These units (manned by civilian contractors) are comprised of two 20-foot long trailers crammed with state-of-the-art manufacturing machinery. When one-of-a-kind or a small number of parts are needed for any purpose, the RMS can make them quickly based on electronic data packages received from a central data base, or by reverse engineering the part(s). Additional RMSs are scheduled to deploy to Southwest Asia by March 2005.

RESETTING THE FORCE.

Once the task of sustaining current operations begins to wind down, the capabilities of the industrial base will turn toward re-equipping the force for the next conflict. Current policy requires anything on the “critical items list” be replenished within three years of a major conflict. The Army’s goal, however, is to return active units to their pre-deployment readiness within six to eight months and reserve units within one year.



Engine repair at Red River Army Depot.

Termed “resetting” the force, this goal will require new equipment as well as repair of damaged or worn equipment. The sheer volume and anticipated condition of material returning from Iraq suggest that the Army depots must be prepared to maintain a wartime work tempo for up to two years after actual Army operations in Iraq stabilize at a low level.

“The reset program will repair major items used in OIF and OEF...The workload for this comprehensive effort is immense: about 1,000 aviation systems; 124,400 communications and electronics systems; 5,700 combat/tracked vehicles; 45,700 wheeled vehicles; 1,400 missile systems; nine Patriot battalions; and approximately 232,200 items from various other systems.”

*~The Honorable R.L. Brownlee,
Acting Secretary of the Army,
the Army Posture Statement, February 2004*

All this means that for the foreseeable future, the load of work for depot level maintenance and repair will continue to be unusually high. Of course, it will begin to moderate over time, but is unlikely to return to pre-2001 levels for years. In the meantime, occasional spikes in workload, perhaps even on the order of the current one, should be expected as American military forces continue to wage the War on Terror.

■ THE ARGUMENT FOR ENHANCED PUBLIC-PRIVATE PARTNERSHIPS

The experiences of the organic industrial base during the past several years offer unique and invaluable insights. The unexpected scope and nature of the war in Iraq came immediately on the heels of a deliberate and significant downsizing of the industrial base. It has brought into sharp relief the consequences of decision making that placed a heavy emphasis on efficiency when risk appeared low.

But at the same time, the seeds of flexibility that were sown through innovative business practices and legislation of the post-1995 BRAC period have grown into their own under the stresses of wartime demand on the organic base. The performance of the organic base during Operation Iraqi Freedom has shown not only that it can provide goods and services when private industry cannot or will not, but that it can most effectively adjust to the work surge by working more closely with private industry to meet the demands of war. Among the lessons learned from surging workload requirements is the value of applying more aggressive partnering practices and temporary staffing tools to supplement personnel needs during periods of increased demand for the depot services.

For example, private companies have more flexibility in hiring for surge requirements. They can take advantage of various hiring mechanisms, such as limited-term contract employment, and can circumvent time-consuming advertising and applications processes. They generally also have much more flexibility to downsize a workforce. On the other hand, the depots and arsenals are in a better position to send their employees directly to a conflict area to support operations. Public employees are trained and prepared for this possibility. Many private employers avoid or prohibit sending employees into combat areas. Costs of insurance and other support to such employees is high and difficult to predict in preparing bids and proposals.

Merging the hiring flexibility of the private base and the deployability of the public base has long-term advantages. Tobyhanna Army Depot is using private employees to meet surge demands for labor within its depot operation in the United States, while deploying organic personnel to support in-theater activities. There are about 500 contractor personnel, provided under a personnel services contract with Lockheed, at Tobyhanna working side-by-side with the government employees to complete the depot’s wartime requirements.

In another example, the public base has proven more flexible in accepting work that is ill-defined, or subject to considerable change once underway. Contracts held by private industry must be pre-negotiated based on some set of assumptions about the scope and content of the work. Spontaneous changes to those assumptions often result in significant penalty fees or other premiums for the government. At the same time, if the assumptions change dramatically, private companies may not find the associated risk to profit to be acceptable. The organic facilities, however, are not bound by any obligation to shareholders. Additionally, given the large variety and volume of “legacy” systems still in active use within the Army, the organic industrial base is a guaranteed source of repair when original equipment manufacturers have moved on to other systems or gone out of business. Without the organic base, the cost in time and money of re-creating that full capability in the private sector would be significant.

Finally, public facilities often enjoy access to large tracts of land with extensive infrastructure. Activities on this public property are largely immune from real estate taxes and other burdens associated with private property. But they often also lack the modern processes and advanced technology of the private base where investment in new approaches and future capabilities has long been the only way to stay competitive.

SUCCESSFUL PARTNERING.

In practice, several of the Army’s installations have experienced significant benefits from partnering with private industry. Private industry in turn has benefited as each partner exploits the advantages offered by the other.

The most notable examples of true integration of capabilities and work share arrangements involve the Anniston Army Depot, where some of the first public-private partnerships were crafted in the mid-1990s. As the Army’s industrial center for heavy combat systems

such as tanks and artillery, Anniston had long considered the private manufacturers of these systems to be competitors for increasingly scarce upgrade and modification work, and vice versa.

But, encouraged by the twin prospects of no new production of tanks and further rounds of base closures, Anniston and General Dynamics reached agreement in 1996 on a joint program to refurbish and upgrade tanks. That foundation grew to include United Defense L.P., with a joint program to upgrade the M-113 infantry fighting vehicle, and Honeywell, which is producing new parts for the tank’s turbine engine in a building just a few doors down from where the depot’s organic workforce is overhauling those engines.

Nearly 10 years after first discussing partnering possibilities with General Dynamics and continuous growth in the type and nature of partnering programs, the Anniston Depot has now embarked on an unprecedented partnership as a sub-contractor on that company’s new production combat vehicle program, the Stryker. Together, the team was able to deliver new production vehicles within six months of the initial contract award, under an arrangement that included sharing infrastructure, resources and personnel. This example particularly illustrates how the availability of government industrial infrastructure can be an important element in the private sector’s ability to be responsive in very short periods of time to new requirements. Today Anniston has more than 30 partnering and teaming arrangements including co-production, subcontracting and facility use.

In another key example, the Corpus Christi Army Depot has developed a partnership with General Electric focused on engineering support and logistics services. Through a direct contract negotiated in 2000, GE has provided technical and engineering assistance to substantially improve the performance of the T-700 helicopter engine overhaul line at the depot. Through the suc-



successful application of GE innovations, Corpus Christi can now rework an engine in about one-third the time it took four years ago.

Tobyhanna Army Depot has partnered with Engineering Professional Services, Inc., and several other private firms to upgrade the communications capabilities of the AN/PRC-112D, a survival radio critical to soldiers in Southwest Asia and other theaters. Through a combination of Tobyhanna's technical expertise with the entire family of PRC radios, and the private sector's accelerated supply chain, hundreds of radios were upgraded and delivered to troops on schedule and under cost. In this public-private partnership, Tobyhanna will provide repair services on these radios warranted for a ten-year period. Tobyhanna also provides warranted repair in combat zones for commercial computers in partnership with companies such as Dell. These partnerships allow the Army to enjoy the original warranty and companies to avoid sending technicians into harm's way.

Welders on the Stryker production line at Anniston Army Depot.

Letterkenny Army Depot was the site of the first successful public-private partnership including depots. The program involved, Paladin, was moved as part of the BRAC transfer of artillery maintenance to Anniston, but Letterkenny is still engaged in several public-private partnerships which include depot maintenance subcontracting (to the Javelin Missile Joint Venture), and facility use agreements with various companies. Letterkenny also serves as a supplier, manufacturing UAV components for AAI Corp., and biological agent detection units for Lockheed Martin.¹¹

At Red River Army Depot, several successful partnerships are ongoing. These include direct sales to Lockheed Martin for maintenance on the Multiple Launch Rocket System and components for the Patriot

Missile System. Lear-Seigler and Stewart & Stevenson have also contracted to Red River to support maintenance of their production items. In each of these cases, the private companies have sought out the depot to provide unique capabilities. This, in turn, has provided additional work for key depot employees.

The sites that have moved towards more integration of the public and private sectors capabilities at the depot level have been able to provide to the DoD a capability that is more robust, responsive and deployable. It has enabled the Army to build capacity into its industrial operations by leveraging the capabilities offered by both sectors.

■ STEPS TO MORE EFFECTIVE MANAGEMENT OF THE BASE

Further integration of the organic and private industrial bases will provide the additional flexibility demanded by an uncertain future. By combining the best elements of each, a national industrial base can be created that is agile, responsive *and* efficient. But additional changes in the regulatory, policy and legislative environments are necessary to allow this to happen.

FINANCIAL PRACTICES.

Several current practices impose considerable inflexibility on the organic base. These include Congressionally mandated rules limiting “carry over,” or what would generally be considered “work in progress” in private industry. Since depots and arsenals cannot carry over more than a moderate amount of work from one fiscal year to the next, they are faced with a quandary when unanticipated surge work is presented. Either the surge and planned workloads must be accomplished simultaneously, or the planned workload will be reprogrammed to another facility or contracted to private industry. In addition, carry over rules ignore the realities of acquisition lead times and the common practice among military customers of sending unanticipated

workload to the depots just before the end of the fiscal year. These rules need to be adjusted so that industrial planners can make workloading decisions based on each particular situation rather than on an arbitrary time line.

Other financial reforms are needed to allow a more balanced flow of business in both directions, from public to private customers as well as private to public customers. Mechanisms for the efficient procurement by the government from private companies, such as multi-year procurements, variable pricing¹² and elimination of advance payments, need to be put in place to encourage private companies to buy from the public facilities. Without such mechanisms, direct contracting with the organic base is both costly and risky.

Finally, although procurement law allows the organic base to sell products to commercial and foreign military customers under certain circumstances, it does not allow the seller to keep any of the proceeds. This flaw in the system limits incentives to find new customers and, most importantly, fails to reward those facilities that are already operating both efficiently and effectively. In a similar manner, the existing Capital Investment Program gives control over the “profits” made by any organic facility to higher authorities, thus taking investment decisions out of the hands of those who best understand their customers and markets. The organic base certainly will not realize its full potential to support the military customer until financial incentives and investment controls are adjusted to reward the successful government managers.

MANAGEMENT POLICIES.

As the business environment for the depots and arsenals has changed, so too must the way these facilities are managed. Several important changes have been made in recent years, including shifting management responsibility of the depots from Headquarters, Army Materiel Command, to the individual industrial commands that serve as their customers.¹³ Tank-automotive

and Armament Command (TACOM), which manages the arsenals as well as the Anniston and Red River Depots, has taken this concept a step further and combined all its industrial activities into one organization to facilitate cooperation and coordination.¹⁴

Policy at the DoD level still limits what the Army can do with the arsenals, however. Beyond the legislative distinctions discussed below, policy tradition considers the arsenals as a separate category of industrial activity for purposes of budgeting, planning and oversight. While this has led to a certain measure of independence for the arsenals — for example, they can negotiate one-on-one with potential customers — neither do they have the benefit of workload planning that the depots enjoy. Most importantly, the institutional differences between depots and arsenals often prohibit rational work sharing and other forms of cooperation.

Changing the metrics for measuring the performance of the depots from labor hours to productivity is another way policy makers could encourage innovations that would ultimately lead to both effectiveness and efficiency. With the current emphasis on labor hours in all aspects of depot planning, budgeting and evaluation, depot workers receive a “mixed message” regarding the importance of maximizing production or output by finding ways to do the same amount of work in less time.

There are long term advantages to be gained from applying more aggressive temporary staffing tools to supplement core staff levels. The tools can include enhanced partnerships with defense companies to supply contractor support teams on a broad and substantial scale to meet large surges in labor requirements within the depot community. These tools have been proven effective and should become a business strategy of choice within the Army depots.

Finally, it may be time for the Army to consider changing its traditional approach to leadership at its industrial



Aircraft repair at Corpus Christi Army Depot.

facilities. Managing these complex sites, including labor requirements, infrastructure maintenance, capital planning, community relations and environmental stewardship requires the same leadership skills as running any large scale business. It also requires continuity. The current practice of rotating a military Commander in and out of the top leadership position — usually on a two-year cycle — compromises the long-term viability and strength of the local depot or arsenal, regardless of the strengths of any given Commander. Instead, the chief civilian executive, who now functions as the Commander’s deputy and may stay in the job through the rotation of ten or more Commanders, could be given the Chief Operating Officer position. The deputy position would then be given to the military officer functioning primarily as liaison to the Army command structure. The importance of this liaison job will grow as organic sites evolve toward more “joint operations.”

LEGISLATIVE BARRIERS.

One of the most important obstacles for efficient management of the Army’s industrial base is the legislative



Electrical work on armored vehicle, Anniston Army Depot.

distinction between depots and arsenals. With the exception of the Arsenal Act — which applies only to arsenals — the legislation outlined above applies only to depots. Thus, the definitions of “core”, the workloading requirements, and the public-private partnership opportunities, exclude a significant portion of the Army’s organic base.

The artificial distinction between depots and arsenals is a uniquely Army problem (because only the Army has arsenals), and is one that has proven expensive in peacetime and challenging in time of war. In theory, the arsenals engage in heavy manufacturing, while the depots perform systems-level maintenance. In practice, this distinction has blurred over time. But

Congressional attention — and top-level DoD attention — has focused on the depots thus leaving the arsenals behind. This problem could be addressed substantially by integrating arsenals into key depot legislative provisions, such as the Core Logistics Statute.

INTEGRATING INDUSTRIAL BASE PLANNING.

While these changes would go a long way toward improving the effectiveness and efficiency of both the organic and private industrial bases, real transformation will require a management philosophy that considers these two bases as one. Enhanced public-private partnerships through the steps outlined here will encourage this way of thinking over time. But in the meantime, opportunities and capabilities will be lost. The most significant single set of decisions impending about the industrial base — the 2005 BRAC — will consider the organic base in almost total isolation from its private counterpart.

The Army should avoid making this mistake itself, and instead adopt its own successful approach to the ammunition base as a model for the other industrial sectors. For planning purposes, the ammunition base is considered an integrated whole of government-owned and operated facilities, government-owned and privately-operated facilities, and privately-owned and operated facilities. Integrated Program Teams that include representatives of both the public and private ammunition facilities meet each year to address critical issues facing them as a community.

This approach could be applied to other Army industrial sectors. With the depots identified as “Centers of Excellence” for their respective weapons systems, and reporting to their primary acquisition customers, the sector-oriented management infrastructure already exists. A more explicit consideration of private sector capabilities as well as limitations in planning public sector workloads can only improve the overall performance of the base. As is the case with ammunition, such considerations need to take place during the planning and development phases of new weapons programs, and not be limited to maintenance, repair or upgrade.

The Army will have the ideal opportunity to put these concepts into action while implementing the decisions of the next BRAC. The transition plan for the transfer or realignment of missions should include a strengthened emphasis on partnering and public and private integration.

CONCLUSION

Industrial *efficiency* is naturally a prime consideration of policy during peacetime, when the cost of national defense is measured primarily in dollars. But in wartime, when this cost expands to include many more

complex factors, industrial *effectiveness* is essential. As America looks toward a future defined by a long period of undefined conflict in the Global War on Terror, it must be able to count on a defense industrial base that has both attributes.

The positive experience of industrial partnerships proves this is possible. A more aggressive policy to combine the core competencies of the organic base and private companies through an expanded set of partnerships can:

- **Create efficiency** by bringing in business to underutilized organic facilities;
- **Enhance effectiveness** by providing the means to maintain a critical skill base and infrastructure that might otherwise atrophy; and
- **Introduce flexibility** through on-going contractual relationships with private companies that can be amended as needed.

The result can be an industrial base that is responsive to the needs of the warfighters *and* to the interests of the taxpayers.

Aircraft repair at Corpus Christi Army Depot.



- ¹ See Hix, et.al., Rethinking Governance of the Army's Arsenal and Ammunition Plants, RAND, 2003, Chapter Two, for a more complete history of the organic industrial base.
- ² Aircraft were an exception. During the interwar periods the Army Air Corps developed a strong relationship with the private aviation industry, upon which it relied for modern designs.
- ³ A 1977 law required the Secretary of Defense to submit any requests for base closures to Congress for approval. As a consequence, no major closures occurred between 1977 and 1991.
- ⁴ For a discussion of the BRAC history and process, see Taxpayers for Common Sense, available at: www.taxpayer.net/nationalsecurity/learnmore/BRAC; and the Department of Defense at: www.defenselink.mil/BRAC.
- ⁵ The Air Force operates three aviation depots and one aerospace depot; the Navy and Marine Corps operate three aviation depots, four shipyards and two Marine Corps depots. In 2003 the total U.S. Government-owned industrial base employed 77,000 people.
- ⁶ Lexington Institute, Supplying Ammunition: the Lifeblood of the Military, November 2004.
- ⁷ Exceptions are the procurement of major modifications or upgrades designed to improve program performance, or the nuclear refueling of aircraft carriers.
- ⁸ Large caliber cannons, gun mounts, recoil mechanisms, ammunition, munitions, or components thereof.
- ⁹ Helicopters: Corpus Christi; Combat vehicles, artillery and small arms: Anniston; Communications, electronics and tactical missile guidance/control: Tobyhanna; Bradley Fighting Vehicles and Multiple Launch Rocket Systems: Red River; Tactical missile ground support equipment: Letterkenny.
- ¹⁰ Requirement for fielding in fiscal year 2005.
- ¹¹ These units, DFU1000A, successfully detected ricin in a U.S. Senate office building in February 2004. Letterkenny was immediately asked to produce 100 additional units, which they delivered in five days.
- ¹² Variable pricing allows the producer to offer a product at its marginal cost without folding in a pro-rated share of overhead.
- ¹³ Operational command and control of the depots is now exercised by TACOM, Aviation and Missile Command, and the Communications-Electronics Command. These Commands are also responsible for developing and procuring weapons systems.
- ¹⁴ The organization is the Ground Systems Industrial Enterprise (GSIE).

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Printed February 2005 in The United States of America



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