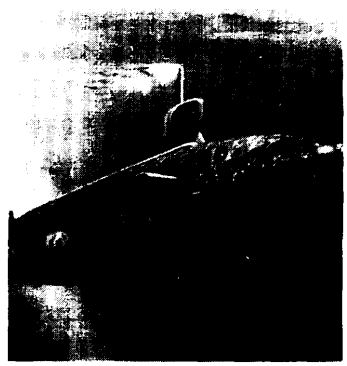
Continued Segregation 6

The future size and character of the segregated portion of the defense technology and industrial base (DTIB) will depend largely on the degree to which policy options discussed in chapters 4 and 5 are implemented. Even with dramatic changes in defense acquisition laws and regulations, however, a significant portion of the DTIB will continue to be segregated from the Commercial Technology and Industrial Base (CTIB). This segregated portion will include activities providing goods and services that: 1) have no commercial counterpart, 2) largely use noncommercial processes, and 3) involve highly classified and controlled technologies and weapon systems.

Secretary of Defense Perry has stated that the government must plan to preserve certain militarily unique capabilities. The Secretary and others have suggested that this might include shipyards that build nuclear submarines and aircraft carriers, production plants for tanks and other armored vehicles, facilities that design and produce high-performance fighter aircraft and bombers, ammunition plants, and nuclear weapons facilities.[1]

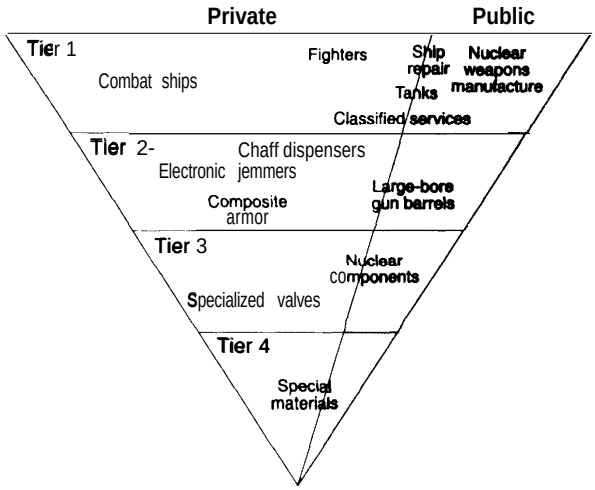
The future segregated portion of the DTIB will also likely include divisions of private firms or small vendors that develop and manufacture militarily unique subsystems, components, and materials that go into larger systems.

The portion of the DTIB that resides in public facilities is segregated by definition. These public sector facilities include military



[1] See, for example, Office of the Under Secretary of Defense for Acquisition, Defense Science Board repon on *Defense Acquisition Reform,* June 1993; and Anthony L. Velocci, Jr.. "Perry Forges New Shape for Industry," *Aviation Week& Space Technology), Nov. 15, 1993,* pp. 52-57.

FIGURE 6-1: The Segregated DTIB



SOURCE Off Ice of Technology Assessment, 1994.

depots, arsenals, Navy shipyards, and defense research, development, and testing facilities.

Although civil-military integration (CMI) is at odds with the preservation of the critical military technologies in the segregated portion of the DTIB, it can still have a positive effect on management efficiency, and promote cost reduction and technology transfer.

This chapter considers the size and nature of the future segregated portion of the DTIB—analyzes CMI policies that might increase management efficiency within the segregated DTIB, reduce costs, and promote process and product technology transfer with the CTIB.

THE CURRENT AND FUTURE DEGREE OF SEGREGATION

A substantial amount of the DTIB is currently segregated from the CTIB. Some of the segregation is the result of acquisition laws and regulations developed during the Cold War. But substantial segregation results from decisions to establish a public sector capability to fulfill some DTIB missions. The Services, for example, have an array of government laboratories to develop military technology, specialized plants to produce ammunition and military equipment, and a network of depot-level facilities to conduct maintenance and repair.

This section describes the segregated portion of the DTIB. It provides an estimate of its current and potential size, and briefly discusses trends affecting this portion of the base.

Description of Segregated Portion of the DTIB

Like the bulk of the DTIB, most of the segregated DTIB is in the private sector. Much of the current segregation in the private sector occurs at the highest tiers of industry, including the major systems integrators who conduct the research and development on complex weapons systems, perform the final assembly of those weapon systems, or produce other militarily unique items. (See figure 6-1.)

For example, as a result of the almost total collapse of the U.S. commercial shipbuilding industry, large naval vessels are built for the most part in segregated private-sector facilities. High-performance fighter aircraft and armored vehicles are also assembled in segregated, private-sector facilities dedicated to the production of these specialized systems. The activities in these facilities may account for 30 to 50 percent or more of the total value added in a large weapon system. (See table 6-1 .)

A great deal of anecdotal evidence suggests that some segregation exists at the lower industrial tiers. OTA interviewed firms in the gear, electronics, aircraft parts, and power systems industrial sectors. OTA found that as a result of defense acquisition laws and regulations, firms often produced military and commercial components in separate facilities even though the components were similar.

Segregation can take a variety of forms. Some firms may concentrate their defense production on a dedicated line, separated from their commercial operations. These same firms may also maintain special parts tracking (including maintaining sep-

TABLE 6-1: Estimated Value-Added by the Prime Contractor for Selected Weapons Systems*

Naval ships	35- 40%
Fighter aircraft	40- 50%
Combat helicopters	40- 50%
Armored vehicles	>50%

'Estimates exclude the government-furnished equipment supplied to the contractor

SOURCE Off Ice of Technology Assessment, 1994

arate capabilities for government parts even though these are the same as the commercial parts) to ensure cost accountability.[2]

Although most of the DTIB is in the private sector, public sector activities in R&D, testing, manufacturing, maintenance, and other services are extensive and, by definition, segregated from the CTIB. The total number of government employees involved in these activities is estimated to be about 369,000 people. (See table 6-2.) In some cases, these government facilities provide unique capabilities. In other cases, they duplicate private-sector capabilities.

The degree of actual government involvement in these activities varies. There are two types of government ownership structures: government-owned/government-operated (GOGO) and government-owned/contractor-operated (GOCO).

The government directly controls GOGO facilities. and the workforce is composed of government employees. GOGO facilities include Service R&D laboratories, Service maintenance depots, air logistics centers, shipyards, and manufacturing facilities, such as Watervliet Arsenal (which makes large caliber gun tubes) and the Rock Island Arsenal (which makes portions of large caliber guns and repairs military equipment).

As a group, the current GOGO facilities are oriented toward the development, production, and testing of specialized military systems or their repair and maintenance. The complex is inefficiently structured, large, and expensive to maintain. The public sector depot-level maintenance system, for example, employs about 181,000 personnel, and billions of dollars are invested in physical plants. On an annual basis, this complex may cost in excess of $5.5 billion in government salaries and several hundred million dollars in infrastructure upkeep costs.[3]

TABLE 6-2: Number of Employees in Government RDT&E, Manufacturing and Maintenance*

DOD RDT&E	
Army	33,000
Navy	68,000
Air Force	20,000
DLA	17,000
Total	138,000
DOE Weapons RDT&E and Production**	
DOE RDT&E	8,000
Production	42,000
Total	50,000
DOD Depot Level Maintenance	
Army	18,000
Navy/USMC	86,000
Air Force	36,000
DLA/Depot	41,000
Total	181,000
Total	369,000

'Rounded to nearest thousand

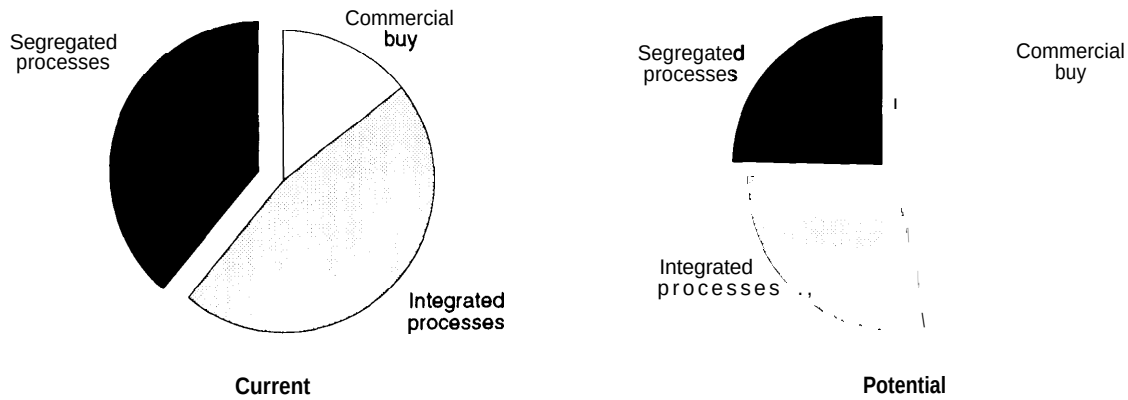
*' Personnel costs here are largely contained in the private sector DTIB totals

SOURCE Off Ice of Technology Assessment, 1994 from Information furnished by OSD, DLA, DOE, and the Military Services

[2] In this situation there is not only a cost for developing and using the accounting systems but also a cost for maintaining a larger inventory because parts cannot be transferred between programs as needed.

[3] *The Defense Science Board Tusk Force on Depot Maintenance Management,* April 1994, repented that "an organic depot with several thousand employees incurs fixed overhead costs in the range of $50 to $100 million annually," p. 17; also see U.S. Congress, Office of Technology Assessment, *Building Future Security: Strategies for Restructuring (he Defense Technology and Industrial Base,* OTA-I *SC-520 @lash* ington, DC: U.S. Government Printing Office, June 1992), pp. 131-132.

FIGURE 6-2: OTA Estimates of Current and Potential National Defense Spending at All Tiers on Private Goods and Services from the Segregated DTIB



SOURCE Industrial survey conducted by the Off Ice of Technology Assessment, 1994

GOCO facilities involve less government control. While the government owns and maintains these facilities, private sector contractors operate them. For example, private firms operating GOCO facilities usually perform the final assembly of conventional artillery rounds. The Department of Energy (DOE) weapon laboratories are operated and managed by the private sector or by a nonfederal government entity. For example, the Martin Marietta Corp. manages Sandia and Oak Ridge National Laboratories, and the University of California manages Los Alamos and Lawrence Livermore National Laboratories. Many of the DOE production facilities are also GOCOs.

OTA Estimates

OTA's industrial sector survey suggested that about 40 percent of the value added to defense goods and services is accomplished in segregated private sector facilities or operations. (See figure **6-2,** left.) This estimate includes direct and indirect purchases of goods and services, thus reflecting activities in all industrial tiers.

The OTA industrial sector survey asked respondents to estimate the percentage of their sectors that are likely to remain segregated even after significant procurement reform (i.e., implementation of policies like those discussed in chapters 4 and 5). Survey results indicated that about 25 percent of the private sector value added might still come from segregated facilities (figure 6-2, right)—about two-thirds of its present size.

This estimate does not include the value added in the public sector DTIB. OTA estimates that about $13 billion is spent on salaries for government employees in largely segregated public-sector facilities.[4]

The policies in this chapter address both the private portion of the DTIB that is likely to remain segregated in the future and the public sector portion of the DTIB.

Relevant Trends

A number of trends will affect the segregated portion of the base. The most important is the ongoing reduction in defense budgets. This spending

[4] Uses a $40,000/year average compensation level provided by the DOD comptroller.

cut is driving a second trend—the consolidation and rationalization occurring in both the private and public sectors of the DTIB. A third trend encompasses the advances occurring in product and process design and development. Increased centralization of planning in DTIB management is the fourth and final trend.

Effects of Falling Budgets

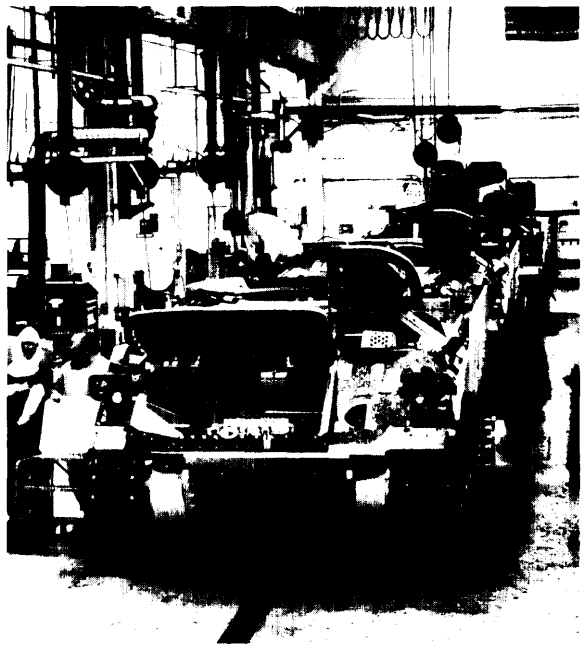
In real terms. defense procurement fell 66 percent between fiscal years 1985 and 1994, including a 51 percent drop between fiscal years 1990 and 1994 alone.[5] R&D fell by 15 percent during that latter period. Procurement of fewer major weapon systems has been a factor in driving up unit costs and driving down the number of vendors willing or able to compete for fewer total defense dollars.

As the number of potential vendors for an item decreases to the point where only one source exists, or the production volume becomes uneconomical, the prospect for using competition to assist in establishing price information begins to disappear. The Department of Defense (DOD) is then faced with maintaining controls over that portion of the DTIB, thus ensuring its segregation.

Consolidation and Rationalization

The extensive consolidation and rationalization occurring in the private and public sectors of the DTIB has had several adverse consequences. DOD planners have been forced to eliminate some of their surge and mobilization hedges, and to make choices between a redundant capability in one area and no capability in another.

There are numerous instances of consolidation among first tier aerospace and defense electronics companies. Loral Corp. has purchased LTV's Missile Division, Ford Aerospace, and IBM Federal Systems. Martin Marietta has purchased GE Defense Systems. General Dynamics sold its aircraft capabilities to Lockheed, its tactical missile capabilities to Hughes, and its space-launcher operations to Martin Marietta. Northrop recently won a bidding war for Grumman Aerospace Corp. Lockheed and Martin Marietta have just announced plans to merge into Lockheed-Martin. More aerospace consolidations are expected as the industry slims down in anticipation of reduced commercial and defense sales. (See figure 6-3.)


UNITED DEFENSE

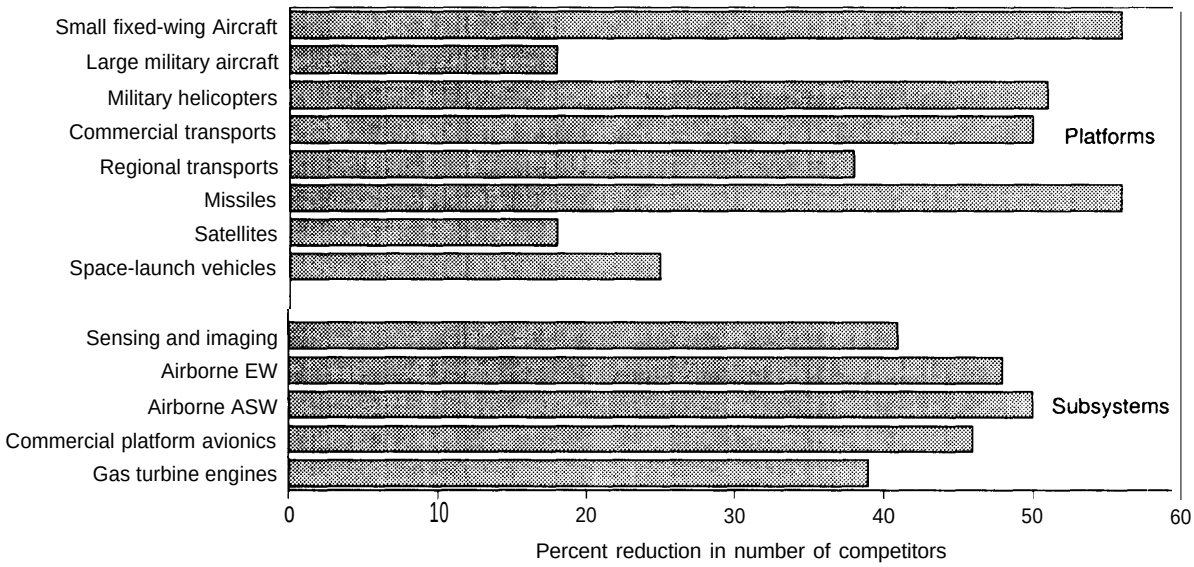
The joint partnership of FMC's defense division and *HARSCO's BMY Combat System Division provides an opportunity for higher utilization rates of facilities and personnel in the face of declining defense sales*

In the armored-vehicle sector, FMC Corp. and HARSCO Corp. recently formed a joint partnership, United Defense. The partnership, which consists of all FMC's defense business and HARSCO's BMY Combat System Division, is consolidating much of its armored-vehicle production at a single site.

Consolidation among the large defense firms is mirrored among the smaller subtier producers, as prime contractors move to reduce the number of their suppliers. Estimates of the aerospace supplier base, for example, indicate a reduction of 60 to

[5] Steven Kosiak, *Analysis of the Fiscal Year 1995 Defense Budget Request*, Defense Budget Project, February 1994, table 7.

FIGURE 6-3: Potential Reduction in the Number of Competitors by Industrial Sector



SOURCE Aviation Week& Space Technology, 1993

70 percent in the number of companies supplying production parts and services.[6]

Some of these smaller firms are leaving the defense business. Others are being purchased by larger firms that are vertically integrating their operations. One result of this consolidation is a reduction in potential competitors in the defense marketplace.

Some observers have argued that necessary consolidation in the private sector of the defense base has been inhibited by the threat of antitrust action on the part of the Justice Department and the Federal Trade Commission (FTC). The August 1992 decision blocking a merger between Alliant TechSystems and Olin Corp. 's Ordnance Division has been cited as an example of inhibiting action by regulatory agencies. There have been only a few cases in which the Justice Department or the FTC has blocked a defense industry merger or charged a violation of antitrust laws. Aerospace executives nevertheless have argued that even though the government may not have actually blocked many proposed mergers, possible consolidations have not proceeded due to concerns over the potential reaction of regulators. Some commentators have argued that U.S. national security objectives may sometimes be diametrically opposed to the competition objectives that underpin U.S. antitrust laws.[7]

Partly in response to these concerns, the DOD formed a Task Force on Antitrust under the auspices of the Defense Science Board "to provide the background that will enable [the DOD] to give the Justice Department and the FTC informed advice on the specific issues that come up."[8] The

6 Anthony L. Velocci, Jr., "U.S. Shakeout Tests Suppliers' Flexibility," *Aviation* Week& *Space Technology,* Feb. 14, 1994, p. 48.

7 Anthony L. Velocci, Jr., "Industry Plight Driving Antitrust Policy *Review,*" *Aviation Week& Space Technology,* Aug. 30, 1993, pp. 45-47.

8 Ibid.

Task Force issued a report on April 4, 1994. It concluded:

> . . . that competition among firms in the defense industry is significantly different from competition among firms in other sectors of the economy, but that the Antitrust Merger Guidelines are flexible enough to take into consideration the special circumstances of downsizing in the defense industry.[9]

The report concluded that DOD must take a more active role in the consolidation process. The Department should provide antitrust regulators with the information required to make informed decisions that will not adversely affect national security.

Consolidation is occurring in the public sector too. Consolidation in DOD research, development, test, and evaluation (RDT&E) agencies has been underway since at least 1989. This process has been reinforced by congressional direction to cut back the civilian acquisition workforce (including RDT&E personnel) by 20 percent between 1991 and 1995, and by the Base Realignment and Closure (BRAC) process.[10] Congress also created the Federal Advisory Commission on Consolidation and Conversion of Defense Research and Development Laboratories to recommend ways to improve their operation. The Commission recommended that: some or all DOD laboratories be converted to GOCO laboratories; the missions and functions of some or all the laboratories be modified; and some of the laboratories be consolidated or closed.[11]

The Army has created a corporate Army Research Laboratory, consolidated several laboratories, and closed others. The Service has eliminated 4,000 to 6,000 positions, leaving a total of 32,579 personnel in its RDT&E activities for fiscal year 1992.[12] The Army funds a federated network of university laboratories and plans to make greater use of civilian developments. Further, it and the other Services have a growing list of cooperative research and development agreements (CRADAs), as well as other activities, directed at increasing technology transfers between the public and private sectors.

There were 67,552 personnel engaged in Navy RDT&E activities in fiscal year 1992. The Navy plans to close several R&D facilities and expects several thousand positions to be eliminated. The Service is examining which technologies might be sourced from the private sector and which will need to be fostered in the defense sector.

The Air Force has reorganized its 14 laboratories into four "super-laboratories," and eliminated more than 2,000 RDT&E positions since 1991. There are now an estimated 20,188 personnel involved in RDT&E activities. The super-laboratories correspond to the Air Force Materiel Command's four product divisions: Aeronautical Systems, Electronic Systems, Space Systems, and Human Systems.

All three Services are pursuing inter-Service consolidation activities through the Defense Science and Technology Reliance Program, which seeks to leverage increasingly scarce science and technology funds through formal agreements that govern planning and research, and designate a lead Service and agency in technology development.

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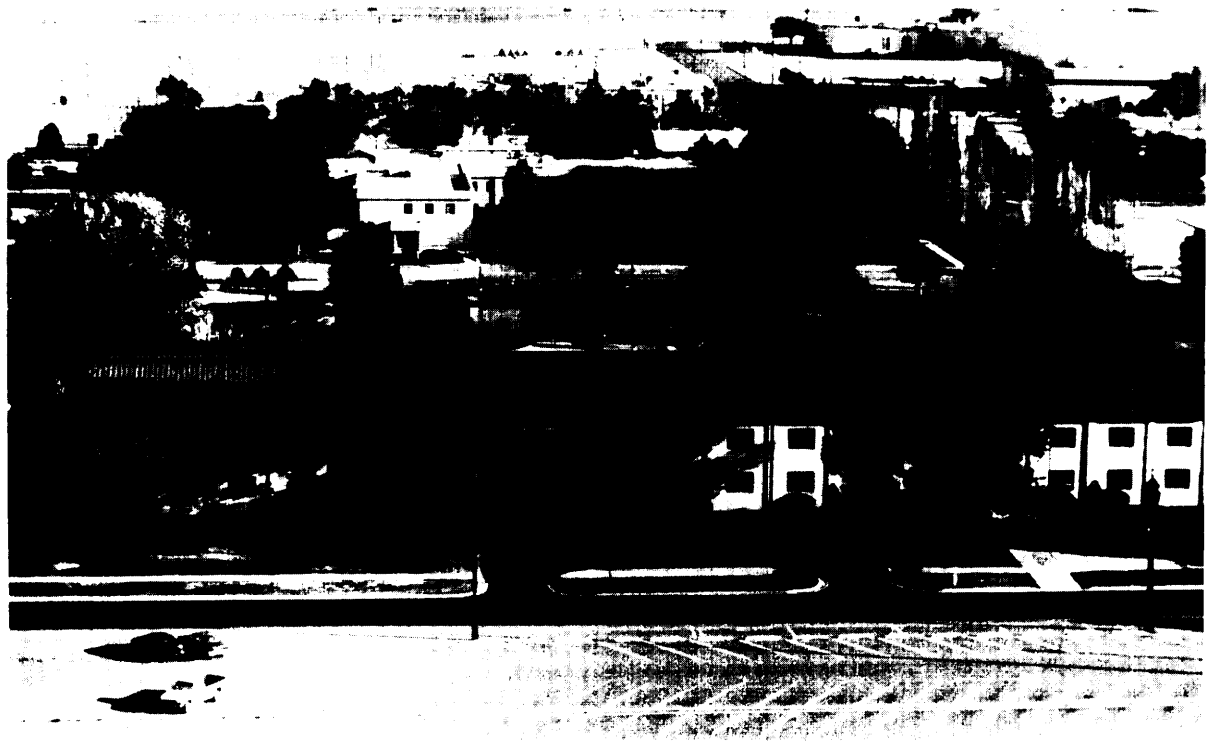
9 Paul C. Kaminski, Defense Science Board, Memorandum for the Under Secretary of Defense (Acquisition & Technology), *Report of the Defense Science Board (DSB) Task Force on Antitrust Aspects of Defense Industry Consolidation,* Apr. 4, 1994.

10 The 1989 DOD Defense Management Review directed the Services to increase efficiency and reduce unwarranted overlap in their RDT&E activities. The congressional action came in U.S. Congress, National Defense Authorization Act for Fiscal Year 1991, conference report to accompany H.R. 4739, Oct. 23, 1990, p. 143.

11 Federal Advisory Commission on Consolidation and Conversion of Defense Research and Development Laboratories, report to the Secretary of Defense, September 1991.

12 U.S. Department of Defense, Office of the Secretary of Defense, Director, Defense Research and Engineering, *Department of Defense in-House RDT&E Activities Report*, (able 1, pp. 1-2, 1993.



One of the Air Force's four super laboratories, Phillips focuses on the transition of space research technologies into operational systems

The Reliance Program has established six categories of inter-Service and interagency cooperation: coordination, joint efforts, collocation, consolidation, competition, and Service-unique. Thirty-one broad technology areas have been identified as important to two or more participants. Program officials have reported a number of successes in eliminating duplication of effort and in coordinating research. The Services report they have moved beyond coordination in many research areas to joint efforts and collocation, The percentage of DOD science and technology funds managed under the Reliance Program reportedly grew from 34 percent in fiscal year 1993 to 46 percent in fiscal year 1994.13

Critics of the Reliance Program argue that the program allows the Services to show cooperation while avoiding real consolidation. The Aerospace Industry Association, for example, has argued that although the program has been billed as:

> . . . one of the most comprehensive restructuring efforts involving the technology base in over 40 years, few have crossed Service boundaries, and virtually none of the Reliance Panels have coordinated their plans with relevant industry R & D.[14]

DOE laboratories involved in nuclear weapons research and development are consolidating and moving toward more interaction with the com-

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13 Joint Directors of Laboratories, *Defense Science and Technology,* December 1993, p. 5. Reliance also includes the Defense Nuclear Agency, the Ballistic Missile Defense Office, and coordination with Advanced Research Projects Agency.

14 Aerospace Industry Association, background paper, undated, *Nationalization of (he Aerospace Industry "R&D Laboratories. '*

mercial sector.[15] Although weapons research remains a high priority, other missions, such as economic competitiveness and environmental cleanup, are gaining in importance. Proposals recommend that as much as 20 percent of these laboratories' R&D budgets be allocated to technology transfer.[16] In addition, the laboratory directors have indicated that as much as 20 percent of the funding will be allocated to the pursuit of common commercial and defense--dual-use--objectives.

Budget cuts are forcing changes in the DTIB maintenance structure. The Services have begun to reduce the size and number of government facilities and to focus similar technologies or systems for all Services at a single site. To reduce and control costs, a greater emphasis is being placed on competition.

Some of these changes may have a direct impact on CMI, The Navy's announced Aviation Depot Policy, for example, has reduced inhouse work and transferred it to private industry. The Navy anticipates closing excess depots as rapidly as possible, consistent with the 1993 BRAC guidelines. It will retain a minimum core capability to maintain fleet readiness.[17]

But other changes may not increase the use of the commercial sector. For instance, Air Force commanders believe that open competition for depot-level maintenance will result in the transfer of much of the military aviation work to Air Force Air Logistics Centers, which Air Force commanders have claimed are the most efficient providers of such maintenance work.

There are a number of obstacles to increasing private-sector maintenance. Fluctuations in the size of workload and the need to retain a capability to repair items long after they had ceased being produced are two of these.

Depot consolidation also faces challenges in Congress. The Services have argued that the legislatively mandated workload limit (no more than 40 percent of the workload can be accomplished by nonfederal employees) has reduced DOD's ability to eliminate inhouse capabilities and to rationalize the private/public base. The DOD Task Force on Maintenance Management, established in the 1994 Defense Authorization Act, recommended retention of a required "core" capability that is not tied to any mandated workload limit. Congress, however, has continued to support a mandated federal workload of 60 percent.

Advances in Product and Process Technology

New product and process technologies with both defense and civilian applications are being developed and perfected at a rapid pace. Commercial companies are making large advances in many product and process technologies, including rapid design and prototyping, quality control, and flexible manufacturing. But current organization and funding arrangements make it difficult to incorporate many of these technologies into the operations of the segregated DTIB. For example, the general lack of available funds (the 1980s were an exception) and the lengthy government acquisition cycle has often inhibited the public sector from updating its process technology in a timely fashion. It often takes at least two budget cycles to justify a request, get the Service authorization, acquire congressional funding, let a competitive bid, evaluate that bid, buy the equipment, and, finally, install it. Incorporation of new manufacturing technology in the private sector has been inhibited partly by a cost-based accounting system that linked profits with total costs and by short contracts that provided few incentives to make such investments.

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[15] These include Lawrence Livermore National Laboratory, Sandia National Laboratory, Los Alamos National Laboratory, Savannah River Technical Center, and Savannah River Ecology Laboratory.

[16] "Energy Labs' Fate, "Al *iation Week & Space Technology,* Apr. 25, 1994, p. 17.

[17] /,l,$,(/t, *the Pentagon,* May 3, 1993.

The private and public sectors have started to remedy these problems. The Technology Reinvestment Project (TRP), for example, seeks to promote the transfer of process and product technology into the segregated DTIB. CRADAs and consortia also aim to foster technology transfer.

Both the Navy and the Air Force have expressed interest in dual-use programs, modeled on the TRP program, that bring together industry, universities, and Service laboratories for research on selected topics. But, ultimately, widespread adoption of new product and process technology by the segregated portion of the DTIB will require changes in acquisition approach and in the government incentive system.

Changes in Government Management

Government management of both private and public sector DTIB resources continues to be criticized as too decentralized and uncoordinated. One result is a DTIB filled with redundancies. Yet here, too, change is occurring. For example, although the Reliance Program still only affects part of R&D funds spent by the Services ($3.6 billion of a total $7.9 billion DOD science and technology investment), there has been an increase in the percentage of such funding in the last year. Service planners now acknowledge that funds "to go it alone" are simply not available and that they must find ways to leverage funds in areas of common interest.

It is unclear how much unwarranted redundancy of research exists among the Services. Because DOD's Director of Defense Research and Engineering (DDR&E) has had only limited involvement, the Reliance Program has been criticized as a "rule of committee" effort in which Service interests, rather than overall DOD interests, are served. [18] Further, even those who support the Reliance Program and believe that it has succeeded in eliminating redundancies criticize its lack of a mechanism for developing a longer range science and technology strategy. They have called for better investment planning. To address this issue, the DDR&E has established a number of boards to identify future defense technology needs and ways to meet them.

Similar inter-Service management problems inhibit consolidation and rationalization in maintenance. Despite efforts to consolidate and provide cross-servicing, the amount of inter-Service maintenance remains small. In 1989, less than 6 percent of the total work was conducted on an inter-Service basis, while it is estimated that 60 percent of maintenance could be conducted across Services. [19] The effort toward more centralized management of depot-level maintenance inched forward with the report of the Depot Maintenance Management Task Force and the publication of a DOD finding that "a DOD-wide core provides greater flexibility to eliminate duplicate resources, increase cross-servicing, and implement efficiency measures." [20] DOD said that it had decided to maintain a DOD-wide core maintenance capability.

Government oversight of the private sector of the DTIB also remains concentrated along Service lines. This results in numerous inefficiencies and redundancies, and leaves DOD without a coherent view of the DTIB as a whole. What appears necessary is a government management structure with good oversight not only across Services, but also across the private and public sectors.

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18 Michael E. Davey, Library of Congress, Congressional Research Service, memorandum, "Current Status of Project Reliance," May 4, 1993.

19 OTA, *Building Future Security*, op. cit., footnote 3, p. 128.

20 John Deutch, Deputy Defense Secretary, letter to Congress, reported in *Defense Daily*, "Task Force Recommends Lifting Rule on 60/40 Depot Split," Apr. 11, 1994, p. 51.

BOX 6-1: The AMRAAM Part III: Segregation

Previous discussions (boxes 4-1 and 5-1) noted that the manufacture of the AMRAAM is largely segregated from commercial production and that segregation is likely to continue at the system-assembly level for the AMRAAM. At the next tier, segregation is likely to continue for militarily unique components such as rocket motors, propulsion systems, and explosives, However other components, subcomponents, parts, hardware, and materials may be produced on integrated production lines and some of these components and subcomponents will probably be commercial.

While the expansion of the use of commercial items or Integrated processes in the AMRAAM may be limited, future missiles may have greater potential for integration. A government-sponsored study group examining the technology and Industrial base for missiles concluded that there were several commercial product and process technologies available for missiles. But many of the necessary technologies are likely to remain segregated.

TABLE 6-A: Commercial Availability of Critical Technologies and Manufacturing Processes

	Critical technology	Critical manufacturing process
IR / radar domes	❑	
Warheads	❑	□
S&A devices	1	□
Fuzes	El	❑
Rocket motors	❑	❑
Control activation system	□	○
Thermal batteries	□	□
Composites	○	○
Microwave devices/ assembles	❑	○
TWTs	○	0
IR detectors	□	□
VHSIC / ASIC	■	■
Multichip modules	■	■
MMIC / MMIC modules	❑	0
Fiber optics	■	■
Displays	■	■
Low observable	❑	□
Counter stealth technology	❑	❑
Image processing		
Homing guidance autopilots	0	
ECCM	❑	
Data fusion	□	
Simulation / modeling	○	
Ada software	❑	
Super computers	■	

■ Available O Somewhat available Not available

TABLE 6-3: Sources of Continued Segregation

- Militarily unique product or process.
- Insufficient demand.
- Highly classified product or process.
- Specialization on core competencies.
- Public sector facility.

SOURCE Office of Technology Assessment, 1994

The need for a more centralized oversight and planning for the use of available technology and industrial resources, however, should not be mistaken for a general demand for greater centralization in the execution of decisions. As chapters 4 and 5 indicated, a key to further CMI includes the willingness to decentralize contracting and oversight authority and to allow personnel in the field more latitude in implementing policy.

WHY SOME DTIB SEGREGATION WILL CONTINUE

No matter how successful commercialization and integration of processes may prove to be, a portion of the DTIB is likely to remain segregated. Key reasons for continued segregation are listed in table 6-3.

Militarily Unique Product or Process

While commercialization or integration of military production may make economic sense for the base as a whole, sound business practices may dictate, in at least some cases, segregated R&D, production, and maintenance regardless of changes in acquisition laws and regulations. This is especially true where military needs are unique, and the products required to meet them substantially differ from those necessary to fulfill commercial requirements.

The conventional ammunition industry, for example, is likely to remain segregated. Most military ammunition is significantly different from what is sold commercially. The associated military tooling and processes are also dissimilar. The manufacture of military ammunition, for example, requires working with exotic materials (e.g., boron alloy and depleted uranium); mixing, blending, drying, and packaging energetic (e.g., TNT, RDX, HMX); and melting, pouring, and pressing explosives.[21] Further, firms that deal with explosives and propellants face very stiff safety and environmental requirements. Large real estate investments are needed to ensure adequate safety in case of accidental explosions, special buildings are required to mitigate the effects of any accidents, and an increased investment in environmental control equipment is necessary. The combination of unique products and specialized processes makes it unlikely that either commercialization or process integration can succeed in this sector.

Other systems and operations likely to remain segregated because of their uniqueness are the production and final assembly of major combat systems such as submarines, aircraft carriers, and other large naval combat vessels, and the assembly of high-performance fighter aircraft, combat helicopters, and ground-combat vehicles (tanks, armored personnel carriers, and their follow-on systems). Although many of the components and subcomponents of these systems can potentially benefit from the use of commercial items and commercial buying practices, the systems integration and final assembly of these expensive items are sufficiently costly and unique to demand continued oversight. The adoption of Activity Based Cost Accounting might reduce some of these problems.

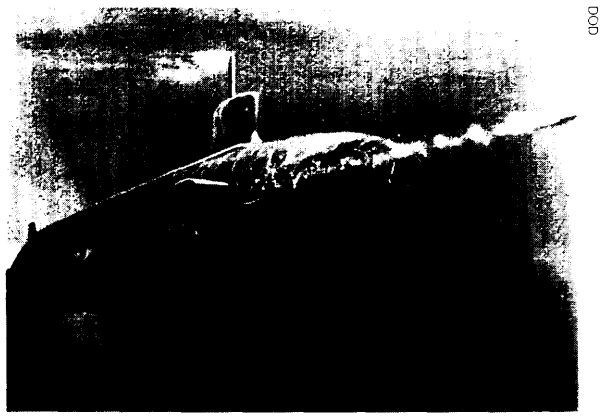
Insufficient Demand

The tremendous reduction in defense items likely to be developed and produced in the foreseeable future lessens the opportunities for competition to

[21] James Blackwell, *Munitions industrial Base Forecast*, a study prepared for the Munitions Industrial Base Task Force, Science Applications International Corp., October 1993, p. 25.

control costs in many areas. Even now, many military systems are procured in such low numbers that multiple producers do not exist.

Once a system is fully developed, the government might buy it on a firm fixed-price contract, and thus reduce the need for oversight. But the combination of high cost, large technological risk, and low demand make it likely that the government will continue to require the type of cost-accounting and oversight for these systems that interfere with commercial work and prompt continued segregation.



Although final assembly operations on systems such as nuclear submarines are likely to remain segregated, subsystems and components may come from integrated firms and facilities

Highly Classified Product or Process

In some cases, segregation will continue because the national interest would not be served by making certain products or processes openly available. One of the most obvious examples is nuclear weapons. Not only are nuclear weapons militarily unique, but also their development, production, and maintenance involve technologies over which the government needs to retain tight control.

Other technologies likely to remain highly classified and therefore segregated, include those relating to the fabrication of stealth materials and electronic warfare computer codes. Although some of these technologies could be developed and produced in a commercial firm, the classified portions of the process would need to be segregated from nonclassified activities.

Specialization on Core Competencies

Segregation may not always be due to the nature of the products and processes. In some cases, segregation may result from a manufacturer's *choice* to concentrate on defense work, to the exclusion of commercial, nondefense activities.

Studies indicate that the diversification patterns of successful businesses stress the exploitat ion of similar "core capabilities" for both new and old products.[22] Accordingly, firms tend to focus on developing a core of similar technical competencies, rather than on manufacturing disparate products. These competencies might include a detailed knowledge of military threats and missions, something a commercial firm is less likely to have.

Even with increased use of flexible manufacturing and diversification into dual-use sectors, this situation is likely to continue. From the perspective of some firms, there are advantages to dealing mainly with government customers—the DOD or others. These advantages include the ability to focus marketing efforts on a narrow range of potential customers and to exploit customer contacts developed over years or decades. Loral Corp., for example, appears to be successful in using a strategy of specialization.

Public Sector Facility

Another reason for continued segregation of some facilities is a deliberate government decision to maintain separate government capabilities for activities that could otherwise be conducted in the private sector. In particular, the military has argued that a core maintenance capability, sufficient to support a crisis or conflict, should be retained within the Services, rather than depend entirely on

22 David p.Leech, "Conversion, Integration and Foreign Dependency: Prelude to a New Economic Security Strategy} '," *GeoJournal*,31.2 (Boston, MA: Kluwer Academic Publisher, October 1993), pp. 193-206.

private contractors. This core includes Service air logistics centers, depots, and shipyards.

While industry has generally supported the retention of a core Service capability, it has favored a smaller capability than that proposed by the Services. The congressionally mandated Depot Maintenance Management Task Force's April 1994 report recommends a general reduction in the size of the retained core and a reduction in the excess depot capacity that would result from this smaller core.

DOD RDT&E centers provide a valuable service exploring militarily relevant technology. They offer the expertise to make DOD a "smart buyer" of technology. In the past, DOD laboratories have used about 30 to 40 percent of their funds in-house, while the remainder has flowed to the private sector. That split is unlikely to change radically. Although many of these facilities are likely to be closed or reduced, and the rest will probably conduct more business with the private sector, it remains likely that a significant, segregated public sector capability will remain.

CMI POLICY OPTIONS FOR THE SEGREGATED BASE

CMI policies might help reduce costs within the segregated portion of the DTIB and promote technology transfer with the larger CTIB. Indeed, because weapon systems are likely to be developed and assembled within the segregated portion of the DTIB, CMI policies in this segment of the base are critical in determining both the character of future forces and the overall size of CMI cost savings that can be realized.

Many of the acquisition reforms (discussed in the preceding chapters) that allow for increased commercial purchases (elimination of military specifications) and integration of processes (elimination of military standards) could be applied to the segregated DTIB. Moreover, an emphasis on CMI could help guide DTIB rationalization and consolidation, producing added benefits.

This section examines three broad CMI policy areas. They are policies aimed at: eliminating redundancies and rationalizing capabilities within the segregated DTIB, and between the segregated and integrated portions of the DTIB; applying the acquisition reforms discussed in chapters 4 and 5 to the segregated DTIB; and promoting technology transfer into and out of the segregated portion of the DTIB.

Eliminate Redundancies

As the defense budget declines, DOD may realize some of the biggest cost savings in eliminating redundancies in the segregated portion of the DTIB. The value added in the private and public portions of the segregated DTIB may have totaled about $56 billion in 1992.[23] Cost savings could be achieved if redundant operations were eliminated, facilities closed, personnel reduced, and future infrastructure investments avoided. The 1993 Defense Science Board Task Force on Acquisition Reform estimated that a 25-percent reduction in DTIB government personnel might be possible. This degree of reduction, if applied to the public sector RDT&E, manufacturing, and maintenance base, might eventually result in a savings of several billion dollars per year.[24]

The moves to consolidate and eliminate redundancies in the DTIB mirror changes in the national economy. The broader CTIB is undergoing extensive restructuring. This involves eliminating layers of management, closing redundant manufacturing facilities, and cutting overlapping R&D programs. As a result of these changes, firms are stronger and more globally competitive.

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23 Based on Department of Commerce data and a 1992 level of $314 billion on all national security. OTA'S industry survey estimated that about $43 billion of the approximately $180 billion spent for national security in the private sector in 1992 might remain segregated. In addition, another $13 billion might be spent for the public sector workforce involved in R&D, production. and maintenance activities.

24 When such savings might appear is not clear since there is a significant up-front cost associated with personnel reductions and facilities closures. Critics, for example, argue that the current BRAC is fiscally unexecutable.

DOD can guide the DTIB consolidation process. The Reliance Program, for example, has allowed the Services to turn over research responsibilities for selected topics to lead Services or collocate personnel working on these topics. Changes at the Services' depot-level maintenance facilities have increased cross-servicing of selected items, although this activity is still taking place on a small scale in comparison to its projected potential. The Services also plan to increase reliance on selected elements of the private sector for production and maintenance.

But DOD efforts at consolidation are only beginning. They will have to increase significantly if a viable capability is to be retained. Otherwise, there will be too many facilities, with the bulk of funding spent on infrastructure and salaries rather than on R&D and maintenance.

Congress has given little support to most of DOD's consolidation efforts. DOD facilities represent high-paying jobs in many parts of the United States, and the loss of employment is a matter of congressional concern. Wartime readiness is another concern. The principal justification for a strong, redundant, in-house maintenance base is the need for a quick-response capability. This justification is explicitly stated in the fiscal year 1994 Defense Authorization Act in a "Sense of Congress" statement supporting in-house DOD depot-level maintenance and repair activities as "uniquely suited to responding to the increased need for repair and maintenance of weapon systems and equipment which may arise in times of national crisis."[25]

The upcoming 1995 BRAC review appears to be particularly important for the consolidation effort. The BRAC review helps raise the defense reduction effort from a local to a national effort. The Services appear to be working hard to prepare for it. Several officers predicted, however, that the necessary base closures and realignments (expected to be far greater than in previous efforts) would not be made in 1995.

These concerns appear warranted. Newspaper accounts in May 1994 indicated a reluctance in both the White House and Congress to make major closures. Deputy Defense Secretary John Deutch announced that delay of some planned closures for two years is under study. Some in Congress have recommended delaying all 1995 base closings until 1997. Reasons cited include the immediate costs associated with closings, such as environmental cleanup and severance pay, and concerns about the loss of jobs at a time when alternative employment appears unavailable. However, any delays would adversely affect projected long-term cost savings.

Private sector mergers, acquisitions, and bankruptcies, especially in manufacturing, are eliminating redundancies more rapidly than activities in the public sector. Here too, however, there is resistance to the rapid loss of jobs. One of the responses has been to fund the manufacturer of weapon systems that no longer have military mission requirements. And, as mentioned earlier, antitrust action or the threat of such action, may have slowed consolidation within the private sector.

The process of eliminating redundancies between the private and public sectors is just beginning. DOD and the Services are attempting to identify private R&D capabilities that can be used in lieu of government capabilities. Studies aimed at identifying such capabilities must be accelerated.

Not all redundancies can or should be eliminated. Some overlap in R&D, manufacturing or maintenance ensures that the government does not become dependent on a single source for support, has the capability to respond to crisis, and can promote innovation. Redundancy in research, for example, can promote innovative solutions to technical problems. Scientists see the resulting "competition of ideas" as key to arriving at the best solution. Yet budgetary constraints are forcing a reevaluation of acceptable changes.

25 10 USC 2466, Sec 345.

Direct Consolidation

During the Bush Administration, the stated DOD consolidation policy was to allow market forces to shape the private sector defense base. The Administration acknowledged, however, that some sectors—for example, nuclear submarines—might require direct government intervention. The Clinton Administration has been more expansive in its concerns about special sectors, including armored vehicles and high-performance fighter aircraft. It has favored taking action to ensure the viability of important defense industrial sectors.

DOD influences the DTIB through the award of contracts. DOD may wish to place greater weight on DTIB preservation issues in contracting. To foster maximum CMI, however, these efforts should be selectively applied to the industry in question. DOD must also be prepared for bid protests, particularly in those situations where one bidder will be awarded an entire contract and the other will be put out of that business. "Managed competition" between two producers is an alternative. But this would require a coordinated policy with several product lines. Split awards of varied percentages might serve as an incentive for lowering costs. Congressional support for DOD decisions is essential.

DOD has yet to provide convincing arguments for much of its spending on the technologies or industrial sectors it decides to support. Despite several years of requests and directives from Congress to outline the Nation's DTIB needs and to develop an investment plan to serve those needs, DOD has failed to respond. Not only are key sectors only hazily identified, but there are few metrics for determining how much should be spent to retain a required capability.[26] DOD has several study groups assessing the problem, but their progress may be too slow to affect the consolidation significantly.

As noted earlier, the Justice Department and the FTC also have direct interest in private sector industrial consolidation, particularly in the area of antitrust policy. Antitrust policy is particularly important to the consolidation of the segregated portion of the DTIB. Monopolies are more likely to arise in cases where militarily unique systems are procured in low numbers.

The Justice Department and the FTC have argued that current merger guidelines are adequate to protect national security and the public's financial interests. The Deputy Assistant Attorney General in the Justice Department's Antitrust Division, for example, has stated that "[c]urrent guidelines are fully flexible enough to deal with defense industry mergers."[27] This attitude is echoed in the FTC, which argues that "[t]he flexible approach of the current Merger Guidelines is adequate and appropriate for analyzing defense industry mergers in a reasonable and informed manner."[28]

The Defense Science Board Task Force on Antitrust Aspects of Defense Industry Consolidation supported these conclusions. Although the report argued that competition among firms in the defense industry is significantly different from competition in other sectors, it concluded that the merger guidelines are flexible enough to take into consideration the special circumstances of downsizing in the defense industry. The Task Force also argued that the enforcement agencies are receptive

[26] Some work has been done to assess the relative value of closing or mothballing a facility versus keeping a production line warm despite a lack of a current requirement for the product.

[27] Velocci, "Industry Plight Driving Antitrust Policy Review," op. cit., footnote 7, p. 46.

[28] Laura A. Wilkinson and Steven K. Bernstein, "Mergers in the Defense Industry: Application of the 1992 Horizontal Merger Guidelines." draft paper provided OTA, p. 19.

BOX 6-2: Alliant TechSystems/Olin Corp. Ordnance Division

Many in Industry cite the FTC's decision to block a merger between Alliant TechSystems and Olin Corp.'s Ordnance Division as an example of the impediments facing defense industry acquisitions and mergers The two contractors planned to merge before the DOD concluded a competitive multiyear contract for the procurement of 120mm tank ammunition The contract was designed to eliminate one of the two as a supplier of that ammunition to the Army

The FTC attorneys argued that even though the tank ammunition in question could be purchased in Germany, DOD policy made such purchases unlikely; therefore, in practice the market was limited to the United States Because of declining DOD needs, a new producer was unlikely to enter the market and a merger of the two firms would effectively eliminate competition, The attorneys also reported that there was some evidence that the cost of the rounds might Increase as a result of the merger, Although some of DOD witnesses testified in support of consolidation on the grounds of efficiency, DOD took no formal position on the merger The FTC argued that, based on all the expert Information available, "[T]he overwhelming conclusion from all of these sources was that DOD would obtain the best quality and prices for ammunition under a competitive scenario versus the proposed merger,'"

The court eventually decided not to allow the merger to proceed It found that the elimination of competition between Alliant and Olin could "raise the cost of the contract for the Army between 5 percent and 23 percent, or $25 million to $115 million."[2] Moreover, the court rejected the claim that national security might be Impaired if the merger were stopped,

The potential increase in cost and the lack of solid DOD support appear to have been key reasons for the decision.

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1 **Defense Science Board Task Force on Antitrust Aspects of Defense Industry** Consolidation, p 5

2 FTC v Alliant TechSystems **Inc** 808F, Supp 9 (D D C 1992)

to information from DOD on national security and other special concerns .29

The Task Force concluded that the DOD did not have to take a position on every transaction, but it recommended establishing an "institutional capacity to assemble and transmit information."[30] The Task Force argued that DOD could work with enforcement agencies to ensure that its national security views on proposed mergers or joint ventures are known. The consensus among DOD and enforcement agencies appears to be that legislative changes on defense antitrust are not required.

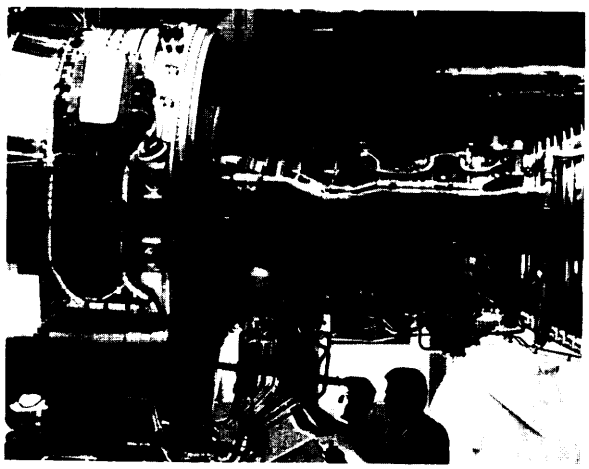
Still, anecdotal evidence suggests that many industrialists have come to a different conclusion. They see a significant risk that mergers will be halted on the basis of antitrust concerns. This could make corporate merger attempts less attractive. DOD will need to work more closely with industry to promote flexibility in this area.

Government vs. Private Ownership Issues

Eliminating redundancies between private and public sectors will inevitably force decisions concerning the public sector's role in defense. It is here that an emphasis on CMI may have its greatest effect on consolidation of the segregated DTIB. A consolidation strategy designed to maximize the benefits of CM I would tend to favor private over public ownership and operations. The

29 Office of the Under Secretary of Defense (Acquisition), *Report of the Defense Science Board Tusk Force on Antitrust Aspects of Defense Industry Consolidation*, April 1994, p. 4.

30 Ibid., p. 5.


PRATT & WHITNEY

Original manufacturers of equipment, such as Pratt & Whitney, also have the ability to perform depot-level maintenance.

result is a preference for private companies over GOCOs, and GOCOs over GOGOs, unless more pressing factors override the desire for CMI.

U.S. government policy has stressed the use of private firms whenever possible. Advantages of private ownership include greater labor flexibility, more responsive capital investment capabilities, greater breadth of management, and the potential for greater access to commercial technology.

DOD has minimized private sector participation in maintenance. Even when private companies are supremely capable of providing maintenance on a weapon system--often because they produced it—DOD goes to great length to transfer maintenance responsibility to the public sector. While some argue that this transfer is vital for crisis responsiveness, it can be expensive. For example, in the case of some electronic equipment, developing the testing equipment and the technical data packages to allow the Services to perform maintenance reportedly adds 25 percent to the total cost of a contracts[31] Again, this transfer often means the replication of capabilities possessed by the original manufacturer. Commercial support would appear to be preferable.

Still, in a period of reduced defense spending, the private sector may be unable or unwilling to maintain capabilities that the military deems essential. For example, firms will maintain surge production capability only if the government is willing to pay for it.[32] In such cases, government ownership may be required. Table 6-4 presents several reasons for government ownership.

Industries that meet several of these criteria include: the large-caliber ammunition industry, submarine and shipbuilding, and the armored vehicle and fighter aircraft industries. To date, the private sector has been willing to retain a capability to develop and produce many of these items, albeit with extensive government-supplied special tools, facilities, and equipment. Given current budget trends, however, it is uncertain whether there will be sufficient business to provide financial incentives for private sector work in these areas. Should demand fall sharply, government ownership might prove less expensive than creating an artificial demand.[33]

Many government arsenals and maintenance facilities were upgraded during the 1980s defense buildup. To take advantage of the upgrades, some officials suggest putting these facilities under

TABLE 6-4: Factors in Government Ownership

- High capitalization and replacement costs,
- Long replacement time.
- Uneven demand for product or service.
- No commercial counterpart,
- Need for responsiveness.
- Critical security controls,
- Extreme hazards (safety or environmental)

SOURCE Off Ice of Technology Assessment, 1994

[31] Office of Technology Assessment discussions with industry.

[32] Industry argues that DOD currently has no plans for surging production and therefore no plan for funding the capability.

[33] U.S. Congress, Office of Technology Assessment, *Building Future Security*, op. cit., footnote 3, anticipated combining all types of armored vehicle production into two sites.

BOX 6-3: Ownership Alternatives of Other Nations

Other nations have taken a variety of approaches to defense ownership Two allies, France and Japan, manufacture a relatively full range of defense items. They have taken very different tacks on ownership,

France

Nearly four-fifths of the French defense industry is owned directly or Indirectly by the state, either in the form of government-owned and -operated arsenals **and** nationalized companies (e.g., Aerospatiale, GIAT Industries, and SNECMA), or as firms in which the government owns a large share of the stock (e.g., Dassault Aviation, Matra, and Thomson-Brandt Armaments). These nationalized defense firms do not face the same pressures as private firms to provide a short-term return on Investment, but because they may be only partially nationalized they have access to private capital market as well as to government subsidies.[1]

Japan

The Japanese, by contrast, rely almost totally on the private sector for defense R&D, production, and maintenance Japanese firms are responsible for the development of new technologies and systems, as well as providing subsequent depot-level maintenance for their products throughout their service life.

[1] U S **Congress, Off Ice of Technology Assessment,** *Lessons in Restructuring Defense Industry The French Experience,* OTA-BP-ISC-96 (Washington DC U S Government Printing Off Ice, June 1992) p 8

GOCO ownership. A GOCO structure might ensure that a facility is available when needed, while providing more flexible personnel policies and greater efficiency. GOCO facilities have become commonplace in the ammunition manufacturing industry, and should be equally acceptable in maintenance.

When established, government ownership of nuclear weapons-related facilities was considered essential because of their critical role in national security, the need for secrecy, the extensive facilities required, and the hazards involved. But DOE weapons laboratories were specifically organized as GOCOs to ensure the availability of the scientific and engineering talent needed to develop, test, and monitor the U.S. nuclear weapons arsenal. A GOCO relationship provided a flexible personnel policy with more attractive wage scales and more flexibility in organization and job categories than would have been the case in a GOGO facility.

Although government ownership is touted as a way to ensure the preservation of capabilities unlikely to be supported by the private sector, the government has not always made the necessary investments. Faced with a choice between funding force readiness and funding industrial mobilization capabilities, the Services tend to favor the former.

For example, despite recommendations to ensure future ammunition capabilities in the DTIB. at the start of U.S. involvement in Vietnam, defense ammunition plants were antiquated and in poor condition. Nothing had been done to update the facilities, let alone maintain them. Millions had to be spent to bring all but two of 24 ammunition plants from the Korean War era back into production for the Vietnam War.[34]

Take Advantage of Acquisition Reforms

Although the segregated portion of the DTIB is unlikely to take advantage of all the reforms pro-

[34] Roderick L. Vawter, *Industrial Mobilization: The Relevant History* (Washington, DC: National Defense University Press, 1993), p. 55.

posed in chapters 4 and 5, its operations can be improved and its costs lowered by adopting commercial specifications, standards, and practices. Incentives to incorporate commercially available components rather than those specified by military description could increase the number of available suppliers and reduce or control costs. This would also reduce the need for flowdown of cost and pricing data.

The increased use of commercial standards and participation in commercial standards bodies will narrow the difference between factory operations in segregated facilities and those in the private sector. Similarly, an emphasis on form, fit, and function specifications will give suppliers an opportunity to apply their best practices to meeting a contract.

Other practices that may be applicable to the segregated DTIB include replacing government quality inspection with statistical process control or other modem quality control processes. But there is some skepticism about alternative quality control methods. Investigations periodically report instances of fraudulent and forged certifications of quality tests.[35]

Because of the lack of available pricing data, elimination of cost accounting requirements appears highly unlikely. Longer term contracts with commercial component suppliers that provide better forecast or parts requirements and shorter parts delivery times can reduce the need for parts inventory and eliminate storage costs. The increased use of commercial parts might lower the costs of individual items. The use of modern procurement practices, such as the use of Electronic Commerce and Electronic Data Interchange, can increase efficiency in purchasing all of these items and have a positive impact on the segregated base. But savings in this area are likely to come from the lower tiers, not prime contractors.

Regulated Industry

Periodically, suggestions are made that the defense industry be treated as a regulated industry, like the electric power industry. Proponents argue that such a change would allow defense companies to operate more efficiently, with less day-to-day oversight. But the potential for such use in the defense industry appears limited. The regulation of the electric utility industry, for example, is facilitated by the fact that it produces a common product for which fair production costs can be calculated. The same applies to other utilities. The defense DTIB, with its complex set of products and processes, is far less amenable to regulation using similar methods.

Increase Technology Transfer

Ensuring technology transfer between the segregated portion of the DTIB and the CTIB is even more important in a period of greater dependence on commercial technology. The Services are developing programs to increase interaction between their R&D community and the commercial sector. In some cases, however, mandates might be necessary to promote the use of commercial technology in component and system designs. Secretary of Defense Perry's recent directive on military specifications and standards is a step in this direction. Such a mandate would force government R&D activities and private sector firms to assess commercial technological developments.

If the Nation is to rely on commercial specifications and standards, the government R&D community will need to be active in the organizations that set standards. Such involvement will ensure that defense stays current with developments in critical sectors.

35 Andy Pasztor, "Unit of Lucas Says 1[Falsified Weapons Data," *The Wall Street Journal*, May 17,1994.

The TRP dual-use research projects and CRADAs might also improve access to commercial technology. But the TRP appears to have little relevance to important militarily unique items such as ammunition.[36] The CRADA process promotes technology transfer out of public sector defense organizations, but CRADAs have potential problems. One concern is that as laboratory-developed technology is transferred out, there will be insufficient investment dollars to assure that defense-oriented laboratories remain on the leading edge of R&D. In the longer term, there may be no more useful technology to transfer. Critics fear that too much attention is being paid to the commercial market and that limited defense R&D funds should be directed primarily to critical defense technologies. To preclude this possibility. laboratories will have to carefully select CRADA partners to ensure the two-way flow of useful technology. The laboratories will have to develop a sustainable, long-term science and technology investment program.

SUMMARY

A significant portion of the future DTIB is likely to remain segregated from the larger CTIB, despite changes in acquisition laws and regulations. The OTA industry survey, for example, estimated that about 25 percent of funding for private sector DTIB activities might remain segregated.

The products likely to remain in the segregated DTIB include a wide range of militarily unique items such as conventional ammunition, fighter aircraft, tanks, submarines, and nuclear weapons and their delivery systems. Because of a lack of commercial overlap or uneconomical production rates, the development, production, and maintenance of these items will likely remain segregated. Further. while many of the subsystems, components, parts, and services going into these products might be procured commercially or from integrated firms, some of these will probably also continue to be developed and produced in segregated facilities.

Despite continued segregation, however, implementation of some of the acquisition reforms discussed in this report can have a positive effect on this portion of the base. In both the private and public sectors, costs may be reduced by the use of more commercial buying practices, the increased use of commercial products, and the reduced use of military standards. The incorporation of commercial manufacturing technology (where possible) and modern quality control systems will also have a positive impact on costs. In the private sector, the challenge will be to devise incentives for segregated contracts to adopt new manufacturing technology. In the public sector, the challenge will be to convince the Services that industrial modernization is critical to their defense mission.

CMI can also affect the segregated portion of the DTIB by helping to guide consolidation and rationalization. Where possible, policy makers should emphasize private ownership and operations over public ones. This would maximize the benefits associated with integration with the CTIB.

The elimination of redundant R&D, manufacturing, maintenance, and testing capabilities, and stronger reliance on private ownership and operation, can potentially produce cost savings. Savings on the order of several billion dollars per year or more appear possible—but such savings require the closing of facilities and the elimination of jobs. Neither of these steps is popular. Further, any savings will take several years to appear.

But not all redundancies are bad—some serve as hedges against future uncertainties. Further, there is a consensus that a public sector role is essential to help maintain government expertise. There is no consensus, however, on how large that public sector portion of the base must be. In the past, Congress has been reluctant to reduce public-sector capabilities and close facilities. A re-

[36] The Munitions Industrial Base Task Force reports, for example, that ammunition firm\ associated with the Task Force submitted 30 TRP proposals and received no awards.

consideration of the role and size of the public sector RDT&E, manufacturing and maintenance base is increasingly important in the face of more fiscal constraints.

As in the preceding chapters, OTA developed a table for considering the cost-savings that might be gained from implementing CMI in the private sector element of the segregated base. Because the segregated DTIB is less amenable to CMI policies, OTA limited its range of possible savings from O to 10 percent. Table 6-5 shows how different savings assumptions could affect overall defense spending.

These savings, however, are additive to those potentially gained in the public portion of the DTIB through the acceptance of commercial practices, use of commercial products, and the elimination of redundancies between the private and public sectors of the base.

Reforming the segregated portion of the DTIB will present considerable challenges to policymakers. Many of these reforms are directly tied to jobs (closing facilities, reducing private or public workforce). Policy makers need to recognize, however, that CMI steps applied in this portion of the base can help extend the buying power of increasingly limited defense dollars, as well as invigorate the national economy as a whole.

TABLE 6-5: Budgetary Impact of Chapter 6 Policies on Private, Segregated Facilities[a]

Estimated average savings	Impact on total private DTIB budget
0%	0%
5%	1%
10%	2%

[a]Based on OTA's estimate that 24 percent of private DTIB spending is affected by these policy options These savings do not include those obtained from consolidation, rationalization, and an increased reliance on private ownership/operation

SOURCE Off Ice of Technology Assessment, 1994