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## Chapter 6

# Good, Integrated Management

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# Good, Integrated Management

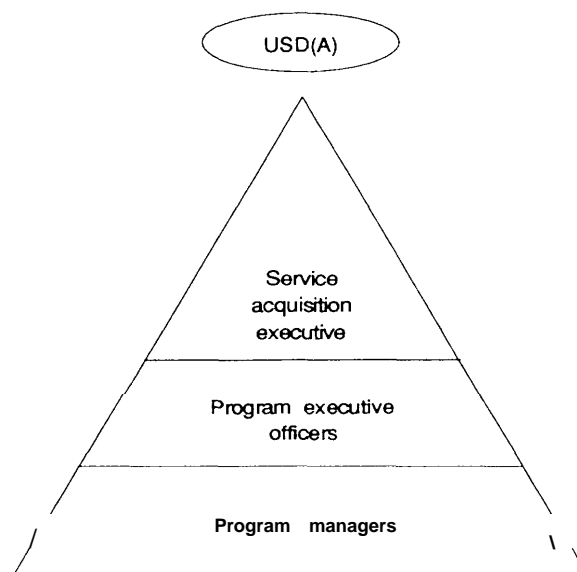
## INTRODUCTION

Previous chapters examined the three principal elements (R&D, production, and maintenance) of the defense technology and industrial base (DTIB), the desirable characteristics of the future base, and ways to achieve those characteristics. *Redesigning Defense* noted that good, integrated management is a desirable characteristic of the future DTIB, **indeed, it is fundamental to its health and strength.** The report defined integrated management as linking the DTIB goals of crisis and wartime response with the peacetime goals of development and production of high-quality and affordable military materiel. Good management will also closely integrate the R&D, production, and maintenance activities of the DTIB. Thus, there is a need for coordination and cooperation throughout the DTIB.

DTIB management has been the focus of a number of recent studies. One of the most influential was the President's Blue Ribbon Commission on Defense Management (known as the Packard Commission), which recommended a number of reforms. Many of these have been adopted, including the establishment of an Office of the Under Secretary of Defense for Acquisition (USD(A)) responsible for Department of Defense (DoD) acquisition policy, administration, oversight, and supervision; the vesting of similar acquisition authority and responsibility in a single Service Acquisition Executive (SAE) within each Service; and a general simplifying of the DoD management structure.<sup>1</sup> (See figure 6-1.)

The most recent annual report of the Secretary of Defense details additional actions taken by the DoD to improve DTIB management and some successes to date.<sup>2</sup> Despite this attention, there is widespread agreement that management of the future DTIB requires additional changes to meet the challenges of the new world security environment.<sup>3</sup>

Figure 6-1—Acquisition Management Structure



SOURCE: Defense Systems Management College, 1989; Office of Technology Assessment, 1992.

This chapter does not assess all recent management initiatives, but focuses on the management implications of alternatives for restructuring the DTIB discussed in earlier chapters. The chief DTLB management challenge is how to preserve an advantage in defense technology and retain the ability to manufacture and maintain military systems—all on a much smaller defense budget.

Additional management changes are needed to promote integration with the Nation's civilian industrial base and to implement a prototyping strategy as the administration and others, including OTA, have suggested. While the Packard Commission recommended the use of prototyping to test new ideas and to lower costs, its recommendations were advanced in the context of large production runs. As outlined in Chapters 3 and 4, the management of prototyping

<sup>1</sup> The President Blue Ribbon Commission on Defense Management, *A Formula for Action: A Report to the President on Defense Acquisition*, April 1986.

<sup>2</sup> Secretary of Defense Dick Cheney, *Annual Report to the President and the Congress* (Washington DC: U.S. Government Printing Office, February 1992), pp. 28-39 and 49-53.

<sup>3</sup> Secretary of Defense Dick Cheney, *Defense Management Report to the President*, July 1989, p. 8. This report noted that "Efforts to date have not produced the tangible results envisioned by the Commission. This is indicative of the dimension of the problems the Commission identified, the far-reaching solutions it offered, and the persistence required if DoD's management of major acquisition programs is to emulate the characteristics of the most successful commercial and government projects."

**Table 6-1-Characteristics of Successful Acquisition Programs\***

- Clear command channels
- Program stability
- Limited reporting requirements
- Small, high-quality staffs
- Good communications with users
- Prototyping and testing

\*The President's Blue Ribbon Commission on Defense Management, April 1966.

will be affected by a transformed security environment that will feature production of fewer new weapons and longer intervals between new system starts. This new environment requires the elimination of the near-automatic link between program start and quantity production.

The changes in the security environment are likely to require significant shifts in management structure and approach. Successfully managing a smaller future DTIB will require a much **more integrated approach by the DoD, the administration, Congress, and the private sector.** For example, a DTIB that is much more integrated with the Nation's broader industrial base will require managers capable of monitoring civilian technology worldwide.

This chapter examines what good, integrated management of the future DTIB will entail, and considers ways to achieve it in the new national security environment.

## GOOD, INTEGRATED MANAGEMENT

Ultimately, the criteria for judging the success of DTIB management will be how well the defense base can 1) provide and support high-quality military equipment at an affordable cost in peacetime; and 2) meet increased military requirements for goods and services in crisis or war.<sup>4</sup> Discussing problems of defense acquisition in the 1980s (many of which still exist), the Packard Commission identified what it felt were certain characteristics common to successful commercial and government

projects (table 6-1). The Commission recommended that the executive branch and Congress change DoD acquisition to develop these characteristics. The Commission suggestions still apply and will strengthen the future base, but alone do not address the changes in DTIB requirements brought on by the ending of the cold war.

### *People*

Trained and experienced people will be critical not just at the top but at every level of future DTIB management. If the future DTIB has greater civil-military integration and less stringent military specifications, the need for individual expertise and judgment will increase at each level. The Packard Commission noted, however, that "recruiting the most capable executives for jobs of such importance to the Nation is extremely difficult. . . in the face of current disincentives to entering public service. These disincentives include relatively low pay for senior government managers; but according to many observers, legislation that severely limits post-government employment is all even greater disincentive.

### *Organization*

*The* overall balance of management activity should change as managers become more concerned about maintaining the base instead of procuring particular systems. The future: DTIB will require shifts away from the present focus on weapon systems production to a focus on R&D and prototyping that might provide more opportunities for testing new ideas and alternative ways of performing a mission. DTIB management might use technologies or mission requirements as an organizing management principle in addition to, or instead of, production. An important management principle remains: the organization must stay small enough to avoid stifling, bureaucratic intrusion and retain flexibility, but large enough to manage the DTIB. Indeed, some observers of the DTIB say that the impediments of government are less a function of the number of regulations than of the number of regulators.

<sup>4</sup>The Department of Defense has recently outlined similar criteria for DTIB management. In its *Report to Congress on the Defense Industrial Base*, November 1991, p. ES-7, the Department noted that:

In order to ensure that industry remains capable of producing the weapon systems the Department of Defense requires, the Department of Defense must manage a range of industrial base activities: the peacetime business of equipping and supporting military forces; ensuring industrial preparedness to deal with potential regional contingencies and conflicts; and planning for the reconstitution or expansion of military forces in response to a potential future, global threat.

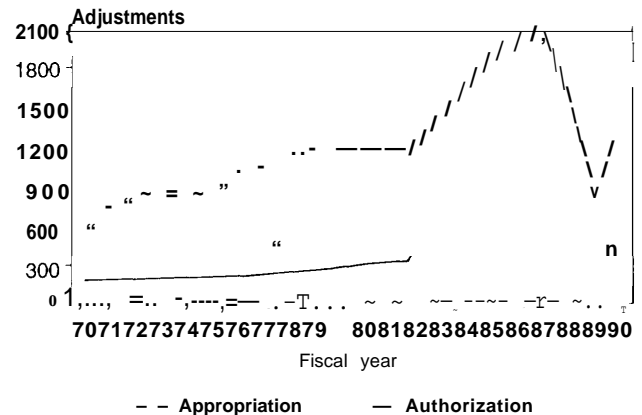
\*The President's Blue Ribbon Commission on Defense Management, op. cit., footnote 1, p. 27.

Streamlining and reducing the DTIB management outside the DoD is important too. Secretary Cheney in his Defense Management Report (DMR) noted that limiting any reorganization to the DoD would not be sufficient to truly improve DTIB management. He argued that the base also suffers from the way Congress carries out its legislative and oversight responsibilities relating to the DTIB, an argument also advanced earlier by the Packard Commission.<sup>6</sup> The Secretary wrote that “profound management problems and waste result from the ‘redundant phases of budgeting, authorizing, and appropriating defense resources year by year’ and that DoD managers are often unable to take needed actions while waiting for uncertain budget authority. He also noted that the large number of congressional committees, subcommittees, and panels with jurisdiction over DoD activities produces “policy gridlock.”<sup>7</sup> He wrote that the complexity and lack of coordination in the congressional defense process increases program costs by more than half a billion dollars and causes instability in planning.<sup>8</sup> (See figures 6-2 and 6-3.)

Similar concerns have been echoed by many thoughtful observers. The problem is not only inefficiency but loss of responsibility. A recent book, for example, reported that the average “defense R&D program is voted on by Congress alone an average of 18 times a year in its 8-year life—a total of 144 opportunities to change something.” One result of this process is that:

... there is no one individual who feels accountable for results—and when things go wrong there is no one to stand and accept responsibility; there are always lots of persons who can be pointed at as having had their fingers in the pie. The problem is a management structure that permits no single individual to be truly responsible for anything, even at the highest organizational levels—up to and including the President of the United States.<sup>10</sup>

**Figure 6-2-Congressional Line Item Changes to DoD Budget Requests**



SOURCE: Secretary of Defense, “White Paper on the Department of Defense and the Congress,” January 1990.

Such lack of accountability, coupled with the costs of the budget process, have prompted many members of Congress to argue for change. For example, Senator Sam Nunn, Chairman of the Senate Armed Services Committee, has observed that “We are spending most of our time looking at grains of sand on the beach, and we are not looking at the ocean or looking at the horizon.”<sup>11</sup>

Congress spends time looking at the “grains of sand” because these represent smaller, potentially solvable problems in which members have an immediate interest; whereas the ocean presents problems that often seem too big and diffuse for Congress to deal with. In addition, Congress steps in wherever it perceives that the DoD has not performed responsibly. The ideal might be for the President to describe an overall strategy, Congress to decide on an overall level of effort, and the DoD to work out details and execute the policy. The reality is that strategies have been difficult to articulate, Congress has had a hard time reaching consensus on the proper level of effort, and the DoD is not just the

<sup>6</sup> The Packard Commission reported:

Where national defense is concerned, today’s congressional authorization and appropriation processes have become mired in jurisdictional disputes, leading to overlapping review of thousands of line items within the defense budget. A growing rivalry between the Armed Services Committees and the Defense Appropriations Subcommittees over the line-item markup of the defense budget has played a major role in moving congressional review of the defense budget toward narrowly focused financial action on individual items and away from oversight based on operational concepts and military effectiveness.

<sup>7</sup> Cheney, op. cit., footnote 3, p. 26.

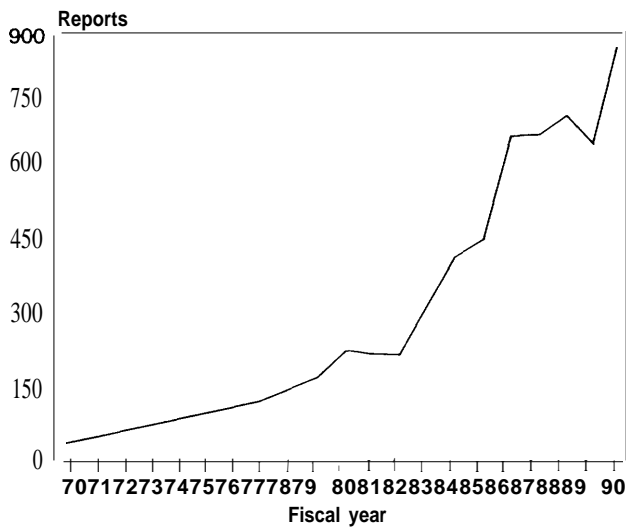
<sup>8</sup> Report to the President by the Secretary of Defense, *White Paper on the Department of Defense and Congress*, January 1990, p. 1.

<sup>9</sup> Kenneth L. Adelman and Norman R. Augustine, *The Defense Revolution: Strategy for the Brave New World* (San Francisco, CA: Institute for Contemporary Studies, 1990), p. 171.

<sup>10</sup> Ibid.

<sup>11</sup> Steven V. Roberts, “Billions for Defense, The Spending Debate,” *The New York Times*, May 17, 1988.

**Figure 6-3-DoD Reporting Requirements in Annual Legislation**



SOURCE: Secretary of Defense, "White Paper on the Department of Defense and the Congress," January 1990.

manager of defense acquisition, but is also, with allies in Congress, the advocate of individual programs. The program-oriented approach has made it difficult to see or organize the big picture.

**Once Congress assumes detailed management and control, the DoD loses its incentive to make internal tradeoffs between one weapon and another to accomplish a given mission, since money saved by canceling one program is unlikely to be moved to the other.**

To promote efficiency, Congress might give up some of its detailed regulatory role by expanding the DoD's incentives to regulate itself. For example, Congress could reduce the proportion of funds directed at specific programs and expand the proportion allocated to particular missions. When money is allocated to "air defense" rather than to a particular weapon system, then the DoD has a greater incentive to stop work on a troubled system in order to have more resources for a more promising approach to the air-defense mission. The higher the level at which funds are aggregated, the greater are the number of options for achieving a military mission, but Congress' control declines. For example, if the Army is

allocated money for air defense, it might choose between guns and missiles, but it is unlikely to consider fighter aircraft. If the allocation is made at the DoD level, the tradeoffs between ground-based and airborne systems can occur. However, by funding at this level, Congress has less influence on which approach is taken.

The danger in making more general funding allocations is that DoD management may produce solutions that a majority in Congress believe are wrong-headed. Congress must choose between giving the DoD responsibility for making choices in the interests of greater efficiency overall and accepting those choices in all but the rarest cases, or maintaining a closer watch over DoD management to avoid the occasional fiasco, while reducing the DoD's incentives to set priorities itself.

### Planning

Good, integrated management also requires a defense industry strategic-planning capability that anticipates future national security requirements and considers DTIB alternatives for meeting them. (See box 6-A.)

Planning was addressed in broad terms in the Packard Commission report and more recently in the 1988 DoD report, bolstering *Defense Industrial Competitiveness*. The DoD report outlined some specific steps, including establishment of a task force to develop a policy on defense industrial planning in support of military operational plans.<sup>12</sup> That task force was never established. But as a part of the DMR, Secretary Cheney directed the establishment of a Defense Planning and Resources Board (DPRB), under the direction of the Deputy Secretary of Defense, to replace the then operating Defense Resources Board. The mission of the DPRB is to "help to develop stronger links between our national policies and the resources allocated to specific programs and forces."<sup>13</sup>

In the absence of DoD actions, Congress has shown considerable recent interest in DTIB planning. It has, for example, mandated an annual plan for developing the technologies considered most critical to ensuring the long-term qualitative superi-

<sup>12</sup> Report to the Secretary of Defense by the Under Secretary of Defense (Acquisition), Bolstering *Defense Industrial Competitiveness*, July 1988. The report recommended, for example, that the DoD "develop industrial strategic plans explicitly linked to military operational plans . . . [and] . . . provide for a continuing assessment of both short- and long-term defense industrial base capabilities," pp. 42-43.

<sup>13</sup> *Defense Management Report to the President*, Op. Cit., footnote 3, p. 5.

**Box 6-A—DTIB Planning Structure**

*The* National Security Act of 1947 addressed the planning requirement squarely. The Act created three boards with planning responsibility for the use of science and industry to support the national security establishment: 1) a National Security Resources Board (NSRB) reporting directly to the President and responsible for formulating policy and plans for industrial and civilian mobilization; 2) a Munitions Board, located in the DoD and composed of Assistant Secretaries of the Army, Navy, and Air Force responsible for planning and coordinating industrial mobilization, production and procurement for the military Services; and 3) a Research and Development Board, also located in the DoD and tasked with developing an integrated R&D program and advising on scientific trends with national-security implications.<sup>1</sup> These organizations never achieved their purpose. The Munitions and Research and Development Boards were abolished in 1953 and their functions transferred directly to the Office of the Secretary of Defense. DoD resource-allocation and major-program planning were later subsumed in the Planning, Programming and Budgeting System (PPBS) established by Secretary of Defense Robert McNamara. The NSRB underwent a series of mergers and reorganizations and ultimately became the current Federal Emergency Management Agency.

<sup>1</sup> See Steven Rearden, *History of the Office of the Secretary of Defense: The Formative Years, 1947-1950*, Historical Office, OSD (Washington, DC: The Government Printing Office), pp. 24-27.

ority of U.S. weapon systems (the DoD Critical Technologies Plan),<sup>14</sup> an annual report on actions taken to improve the ability of the U.S. DTIB to meet national security requirements and the effects on the defense industrial base of defense budgets and plans,<sup>15</sup> and a National Defense Manufacturing Technology Plan.<sup>16</sup> Congress has also strongly urged the establishment of a defense industrial base office within the DoD for the development of policies and plans for the DTIB.<sup>17</sup>

Although such steps appear even more important in the face of a changing international security environment, strategic planning for the DTIB remains controversial. While almost all observers acknowledge the need to ensure that future U.S. military forces have the best scientific and industrial support, some see in DTIB planning the potential for a national industrial policy, which they argue is incompatible with the U.S. free-enterprise system. Others argue that planning is not only essential to match military operations with available resources, but also because the defense industrial base does not operate in a free-market environment. According to this view, the single-buyer relationship between the DoD and defense firms puts a special responsibility on the DoD to plan activities to assure the future health and strength of the DTIB.<sup>18</sup>

Future DTIB planning requires a consensus on what U.S. defense policy will be, what size and types of forces the Nation needs, and what missions they should perform. This consensus has not yet emerged.

**Coordination and Cooperation**

Integrated management requires coordination and cooperation between the government and the private sector and between the DoD and Congress. The 1988 DoD report *Bolstering Defense Industrial Competitiveness* noted that there are now “deeply ingrained adversarial relationships between Government and industry” and argued that these adversarial relationships “undermine industrial efficiency, responsiveness, and technological innovation.”<sup>19</sup> The DMR also noted that the relationship must change, but interviews conducted by OTA with business executives and government officials indicate that a great deal of friction remains. The contracting process is by nature somewhat adversarial and will remain so. Further, the government has a responsibility to ensure accountability of public funds. The tension has been fueled by continued DoD and congressional concerns over unethical behavior by a few defense contractors, combined with intrusive laws

<sup>14</sup> 10 U.S. Code Section 2508.

<sup>15</sup> 10 U.S. Code Section 2509.

<sup>16</sup> 10 U.S. Code, Section 2513.

<sup>17</sup> 10 U.S. Code Section 2503. The office that currently fulfills this function is the Office of Deputy Assistant Secretary Of Defense (Production Resources), which includes offices overseeing industrial engineering and quality, manufacturing modernization commercial acquisition and production base assessment.

<sup>18</sup> Adelman and Augustine, op. cit., footnote 9, pp. 128-130.

<sup>19</sup> *Bolstering Defense Industrial competitiveness*, Op. Cit., footnote 12.

and regulations that often apply criminal sanctions to what might be honest mistakes. Requirements for industry executives to certify, under threat of criminal action, that their firms have properly accomplished numerous activities (many involving paperwork rather than actual production) also costs money and slows the weapons-acquisition process.<sup>20</sup>

The adversarial relationship is not just between the government and industry. The 1990 DoD White Paper on the Department of Defense and Congress noted, for example, that “a final, critical factor affecting congressional defense oversight is a profound lack of trust’ flowing from Congress’ doubts concerning the competence of DoD managers and the Department’s willingness to comply with congressional guidance.<sup>21</sup> Improved intra-government relations will be as important for the future DTIB as will improved relations between government and industry.

### *Clear Laws and Regulations*

**Finally**, good, integrated management of the DTIB will require clear laws and regulations to guide DTIB activities. Both Congress and the DoD have recognized the need for simplifying the laws and regulations governing resource management and defense acquisition. The DoD Advisory Panel on Streamlining and Codifying Acquisition Laws, mandated by Congress, is a step toward achieving this objective. Simplification is essential to any movement toward increased civil-military integration. Ideally, DoD regulations would be no more onerous than those of the many other government agencies, such as the Departments of Transportation, State, Labor, Commerce, and Justice; the Environmental Protection Agency; the Occupational Safety and Health Administration; and the Equal Employment Opportunity Commission.

There are also many congressional committees other than the Armed Services Committees involved in defense procurement, including Appropriations; Banking; Education and Labor; Energy and Commerce; Foreign Affairs; Government Operations;

Intelligence; Science, Space and Technology; Small Business; and Ways and Means.

All of these agencies and committees have different interests, and efficient defense action may not be their number one priority. According to one industry executive, one of the consequences of this current fragmentation of oversight authority is that

There is no central clearing house for policy, regulations, and oversight nor an integration function in either Congress or the Executive Branch. Yet such an organizational responsibility appears necessary for coordination of any policy recommendations. Without an identified change agent’ in the U.S. government, it is very difficult for industry to influence the multitude of issues; that impact or could impact the industrial base.<sup>22</sup>

In the absence of action to change the situation, problems with “fragmentation of oversight authority’ are likely to be compounded in the future, and the laws and regulations that govern defense business are unlikely to be simplified.

The elements of good, integrated management outlined in this section are not particularly controversial in theory but they are extremely hard to implement. For example, many of the Packard Commission recommendations have been accepted only slowly, and even when written into law (e.g., the establishment of a USD(A)), have taken years to have any effect.

There is a fundamental problem of balance between efficiency and accountability in the base. DTIB management should aim to be efficient while accounting for the use of public funds. The need for accountability increases the size of staffs and the numbers of reports. It results in laws and regulations that are more intrusive than they would be if they aimed only at efficient production. Such regulation carries costs that must be weighed against the potential benefits of reducing losses due to fraud, waste, and abuse. A 1989 OTA report illustrated the trade-off graphically (See figure (6-4).) and stated that “Analyses of defense procurement consistently

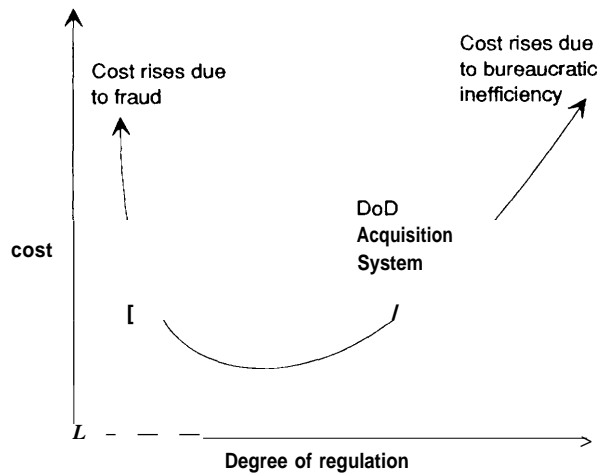
<sup>20</sup> One firm reported, for example, that it had notified the DoD it would stop supplying a product that previously had been considered a commercial item and supplied at a fixed commercial price. The product’s commercial status had changed because it had become obsolete in the commercial world but was still used in the military. Selling the product to the government required adapting to numerous cost accounting requirements and corporate certification of activities with the potential for criminal sanctions.

<sup>21</sup> White Paper on the Department of Defense and the Congress, op. cit., footnote 8, p. 20.

<sup>22</sup> Mr. Gordon R England, executive vice president-Aircraft Programs, general manager-Fort Worth Division General Dynamics, Statement before the House Armed Services Committee Structure of U.S. Defense Industrial Base Panel, Oklahoma City, Nov. 1, 1991.



Figure 6-4-Cost v. Regulatory Intensity



SOURCE: Office of Technology Assessment, 1989.

indicate that the [current] system lies somewhere on the side of excessive regulation, at least in terms of strictly economic consideration.<sup>23</sup> That judgment still appears correct. But the OTA report added that it is possible that “the American taxpayer prefers to pay the high costs of overregulation rather than permit even lesser amounts of public money to go unearned into someone’s pocket.”<sup>24</sup> Congress will want to consider whether the current amount of regulation is optimal for the new defense era.

## ALTERNATIVES FOR MANAGING CHANGE

The immediate challenge facing DTIB management is that the defense budget will shrink markedly in the decade ahead. Earlier chapters argued that a proportional reduction in all sectors of the DTIB would not produce a strong and healthy base. Thus, the United States will face some difficult choices in the coming years.

*Redesigning Defense* suggested some criteria for making these choices by listing the desirable characteristics of the future base. (See table 1-1.) These criteria ultimately affect specific policy choices, as outlined in chapters 2 through 5. The Nation may, for

example, choose to invest relatively more in defense R&D at the expense of production, and close some production facilities and radically restructure those that remain. The Nation may also decide to move more of its R&D capability to the private sector. If so, then some Service research facilities may have to be closed, an action which will require both political and management skills. Similarly, the pursuit of a prototyping-plus strategy, like that outlined in chapter 3, might be accompanied by the reduced production of new weapon platforms, again requiring the closure of some facilities. Three strategies for the transition to a smaller DTIB are discussed below.

### A Free-Market Strategy

*One* alternative advocated for managing the reductions in the DTIB is “allowing the market to decide” which defense contractors will survive in the future. Most of the larger firms that responded to OTA’S defense-industry survey favored this approach.<sup>25</sup> These firms argued that the future survivors in the U.S. defense industry should be decided on the basis of which firms win individual contracts. The DoD, in its recent industrial base report to Congress, stated that “in broad context, free market forces will guide the industrial base of tomorrow.”<sup>26</sup>

A pure free-market approach would make awards based on the ability to meet each individual contract without consideration of the long-term health of the DTIB. Such an approach would have to end the current practice of using one activity to subsidize another. For example, many observers note that the government often tries to mask the true costs of R&D by having companies support R&D in the expectation of recouping their investment from later production profits.

In the extreme, a free-market approach would allow companies to invest in new products, which they would hope to sell to the DoD at a price that covered R&D costs and adequate compensation for the capital put at risk. This approach could work for a variety of so-called “nondevelopmental items,” especially those using the larger pool of commercial technology and production processes. With attention

<sup>23</sup> U.S. Congress, Office of Technology Assessment, *Holding the Edge: Maintaining the Defense Technology Base*, OTA-ISC-420 (Washington, DC: U.S. Government Printing Office, April 1989), p. 152.

<sup>24</sup> Ibid.

<sup>25</sup> See U.S. Congress, Office of Technology Assessment, *Redesigning Defense. Planning the Transition to the Future U.S. Defense Industrial Base*, OTA-ISC-500 (Washington, DC: U.S. Government Printing Office, July 1991), p. 43.

<sup>26</sup> Report to Congress on the Defense Industrial Base, *Op. cit.*, footnote 4, p. ES-7.



Photo credit: U.S. Navy, 1983

Submarine manufacturing technology may be too specialized to be supported by commercial industry alone.

focused on the comparison of the price and value of a product, there would be no need for internal accounting to establish production costs, since the price to the government, not the cost to the company, is the only financial concern of the government in the role of free-market customer.

Industry self-financing would work less well for specialized military products or entire weapon platforms. In these cases, defense R&D would almost certainly have to be funded by the government. Whichever firm was judged best qualified to carry out the development would win the development contract. Afterwards, production contracts could be let using the same criterion. In those sectors where specialized production houses (so-called 'build-to-print' shops) consistently won the production contracts, the free market would evolve toward a division of labor between design houses and production houses. One criterion for awarding a development contract could be that the product be producible in the largest possible number of commercial facilities. In many sectors, however, some advantage would accrue from having the R&D function and production under the same roof. In these sectors, build-to-print shops would not be able to compete, and more integrated firms would evolve.

Multiple sources would survive only when such a market structure was more efficient than one composed of single sources; a pure free-market approach

would not admit to giving contracts to second-place finishers just to maintain alternative sources of supply.

Many observers, as noted elsewhere in this report, argue that pure free-market mechanisms are impossible to apply because the defense industry simply does not operate in a free market, but is instead a regulated monopsony. But a number of these observers argue that eliminating many of the current legislative and regulatory restrictions on defense acquisition will open the defense market to increased competition. This increased civil-military integration of the base may promote the use of a free-market approach in many sectors of the future DTIB.

### *An Activist Strategy*

A second management alternative is a more activist approach, stressing government participation in implementing the changes in the DTIB. The activist approach includes a range of proposals. Some advocates want to select surviving defense firms and support the development of defense technologies having civilian application. The argument for such support is that the broader national technology and industrial base is essential to future U.S. military strength.<sup>27</sup> Advocates of an activist approach see little potential for free-market operation in most of the defense sectors, given the DoD's role as single buyer. As a result, while they support changing the regulatory environment to permit the use of commercial practices, they also favor more government intervention to enhance specific technologies and industrial sectors.

An activist approach is used in France, for example, where government planners allocate defense work to ensure the competitiveness and financial health of the French defense industry. To preserve a key design team, for example, the French procurement agency, the General Delegation for Armaments (DGA) may award a development contract on a competitive basis but give the loser a share of the subsequent production work to keep both firms in business, even if total procurement costs are thereby increased. Similarly, the DGA may procure a system from a French firm even when it could be acquired faster and more cheaply from a foreign source; and it may keep an assembly line

<sup>27</sup> The DoD report *Bolstering Defense Industrial Competitiveness*, for example, examined the negative trends in such dual-use industrial sectors as machine tools and electronics and sought to develop policies to help change these trends.

open between procurement cycles by stretching out the rate of production until the next contract comes along.<sup>28</sup> This approach has sometimes involved making a choice between buying weapons that the French armed services desired or buying weapons to support elements of the French defense base.

### *A Mixed Strategy*

*The* successful management of the future, smaller DTIB will probably involve elements of both the free-market and activist strategies. Where sufficient real competition exists, the free-market approach of providing funds to the successful bidder will be satisfactory. But this competitive environment is limited to particular technologies, mostly subtier industries making components common both to military systems and civilian products. In other areas, where a defense technology or industrial sector has little or no civilian counterpart, source selection on a nonmarket basis is more appropriate.

The DoD appears, in practice, to support this mixed strategy approach. While the DoD has been criticized for placing too much reliance on market forces in defense procurement, the Department acknowledges that the free market alone might not provide the necessary industrial capability in selected areas. For example, because the U.S. shipbuilding industry is dependent on Navy business, the DoD has stated that it “will require continuous monitoring by the DoD to ensure a capable prime contractor and supplier base is available for military needs.”<sup>29</sup> Secretary Cheney has also said that his decision to build another nuclear-powered aircraft carrier was based, in part, on the need to preserve the Navy’s shipbuilding industry.<sup>30</sup> The DoD industrial base report suggests the possibility for intervention in the armored-vehicle sector, although the Department has not yet taken any action to preserve production capabilities in this area.

How much government intervention is necessary will depend on how the Nation structures the future DTIB. Those advocating greater civil-military integration argue that integration will strengthen the free market and ultimately reduce the need for govern-

ment intervention. **But civil-military integration will occur only at the price of modifying some of the regulatory mechanisms currently built into the procurement system to ensure public accountability of funds.**

**Any strategy** to restructure the DTIB requires the government to have a clear vision of the future defense establishment and the DTIB needed to support it. That vision must be communicated to industry. In the words of one defense contractor:

It is our view that the White House, OSD, and Congress must articulate and agree on a national defense policy to avoid the chaos of a teardown rather than an orderly build-down. If a teardown occurs, the quality of defense products is likely to suffer badly.<sup>31</sup>

## **FUTURE MANAGEMENT TOOLS**

Beyond the immediate problems associated with down-sizing, there are longer range concerns over how to manage the future base to get the most return from a smaller and much changed DTIB. Steps that might be taken to improve the management of the future base are outlined below.

### *Improved Planning*

Future DTIB planning must be better coordinated. Today, DTIB planning remains relatively decentralized within the DoD. The individual Services develop plans that are further subdivided into R&D plans, production plans, and depot maintenance plans. Decentralized planning has the benefit of staying close to Service requirements. Yet if it results in costly redundancies and bottlenecks in industrial responsiveness, it will fail to meet either the immediate military needs of the commanders-in-chief of the unified and specified military commands or the longer term needs of the DTIB. Better coordination among the three elements of the base (R&D, production, and maintenance) will help reduce the past tendency of DTIB managers to make decisions that seem best for their organization, but actually have negative implications for the base as a whole.

<sup>28</sup> U.S. Congress, Office of Technology Assessment, *Lessons in Restructuring Defense Industry: The French Experience*, OTA-BP-ISC-96 (Washington, DC: U.S. Government Printing Office), June 1992.

<sup>29</sup> Report to Congress on the *Defense Industrial Base*, op.cit., footnote 4, p. ES-5.

<sup>30</sup> “Indus- Base, Fee Structure Entered Carrier Decision—Cheney,” *Defense Daily*, Feb. 6, 1992, p. 200.

<sup>31</sup> Response to OTA industrial base survey.

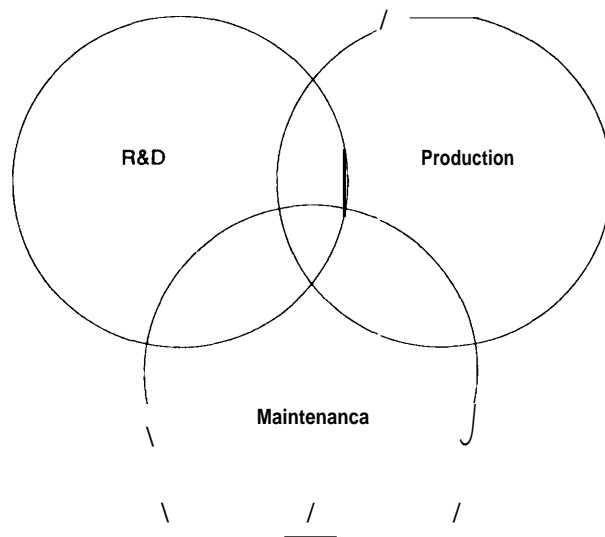
The growing importance of the broader national and global technology and industrial bases in meeting defense requirements increases the need to bring other government agencies into DTIB planning. The Federal Emergency Management Agency (FEMA) is responsible for emergency and mobilization planning involving the civilian agencies. The Department of Commerce might share more peacetime DTIB planning responsibilities with the DoD. Industry must also be more directly involved in the planning process. FEMA has taken a number of initiatives to increase the understanding of the roles that the civil agencies must play in supporting the DTIB.

One of the chief criticisms of current planning is the lack of good information on the DTIB. Operating in a more integrated base with fewer resources will require a better understanding of not only the DTIB, but also the larger national base. The Critical Technologies Plan and the Industrial Base Report appear to have been partly motivated by a desire to have the DoD collect better data and thus develop a better understanding of the base. The DoD has supported several industrial base data-gathering efforts, but has never placed high priority on them.

*Redesigning Defense* examined a number of current government and industrial databases and concluded that all “are short of data because data collection efforts are generally underfunded and are not standardized.”<sup>32</sup> For example, the Defense Industrial Network (DINET) sought to link a number of commercial and DoD industrial databases in order to provide insight into the condition of the DTIB. But according to many observers, this effort was underfunded. In other cases, support for setting up a database has not been followed up with adequate funding for data collection to make that base useful. Systematic data gathering is expensive.

The DoD should set priorities on what data to gather and how much data are needed to manage the base. But, there are other agencies (e.g., such as Department of Commerce and FEMA) that should play a more active role. **Congress can act to ensure that industrial-base data priorities are established by the Executive Branch and that adequate funding is available.**

**Figure 6-5--Integration of the DTIB Elements**



SOURCE: Office of Technology Assessment, 1992.

### ***Organizational Changes***

The future DTIB must have more integration of the R&D, production, and maintenance elements. (See figure 6-5.) The Air Force appears to have begun this process by combining its Air Force Systems Command and Air Force Logistics Command into a single Air Force Materiel Command (effective July 1, 1992). The other Services are also combining elements of their commands.

But more important than the major command reorganizations will be changes involving programs and technologies. The Air Force's new concept of integrated weapon system management (IWSM) is currently being tested on 21 weapons programs.<sup>33</sup> The IWSM establishes a program director in charge of all aspects of the life cycle of a weapon system from R&D through production and maintenance. The program office is located in a product division during program development, but moves to a logistics center once the system has been produced and is operational.”

While a concept such as the IWSM integrates the management of the three principal elements of the DTIB, it may not be adequate in the future environ-

<sup>32</sup> *Redesigning Defense*, op. cit., footnote 25, p. 116.

<sup>33</sup> John Terino, “Doing Business,” *National Defense*, January 1992, pp. 18-19.

<sup>34</sup> United States Air Force Fact Sheet, *Integrated Weapons System Management: Cornerstone of Air Force Materiel Command*, Nov. 1, 1991.

ment because it is focused on managing weapon systems. It does not break the present near-automatic link between development and production. In the future, **research, development, and prototyping will be pursued without the expectation that production of a final system will necessarily follow. Therefore, DTIB management cannot be centered around individual weapons programs. A useful additional concept is that of integrated mission area management. This approach would examine alternative ways of achieving a mission as well as the tradeoffs among R&D, prototyping, production, and maintenance in sustaining an overall DTIB capability to support identified national security requirements. This is now done by the Services in their mission area analyses and in their management of technologies (e.g., the Tank Automate Command looks across the armored vehicle sector). But current efforts are largely limited to programs within a single Service. The Joint Staff might assume the job of analyzing missions among the Services.**

### Degree of Centralization

The degree of centralization of future DTIB management is an important issue. Secretaries of Defense have generally pushed for increased control of resources and acquisition (Secretaries Laird and Weinberger were exceptions), while the Services have sought more autonomy. Proponents of more centralized acquisition argue that current inter-Service coordination will be insufficient to manage the future DTIB so that it will be suitably strong and flexible. Proponents of decentralization counter that centralization will separate equipment acquisition from the military users.

Several forms of centralization have been proposed. Three possibilities are:

1. a "purple suit" (i.e., joint-Service) procurement agency that would buy all military hardware and supplies;
2. a division of procurement tasks so that each Service is responsible for supplying the others with a set of procurement items; or
3. an independent acquisition corps separate from the Services, staffed by civilians.

A joint-Service agency might resemble an expanded Defense Logistics Agency, which is currently responsible for providing common items, such as fasteners, food, and uniforms.<sup>35</sup> This new agency would take advantage of the long-term experience of career civilian procurement officers and the military expertise of Service officers.<sup>36</sup> Its facilities would need to be geographically close to Service technical centers.

Alternatively, tasks could be distributed according to Service expertise or priority. Thus, the Air Force might be responsible for all cargo planes, the Army for all trucks, the Navy for all boats and ships, and the Marines for landing craft. The DoD has run joint procurement programs; some successful (e.g., trucks and 20mm ammunition), and others less successful (e.g., F-111).<sup>37</sup>

A separate civilian acquisition corps could break direct Service advocacy for developed systems to enter production. But a drawback of this approach is that an independent organization can easily lose sight of Service requirements. The French acquisition agency, for example, has been criticized for not being responsive enough to battlefield requirements.<sup>38</sup>

The goals of any reforms should be to reduce redundancy, to make larger, more economical purchases, and to have an experienced cadre of acquisition personnel who do not have a direct Service stake

<sup>35</sup> The Defense Logistics Agency also procures replacements for microcircuits that have gone out of commercial production but are still required for maintaining a weapon system. Many microcircuits have a product cycle of about 7 years, while the systems they are a part of may have an operational lifespan of 20 years or more. See Donald O'Brien, testimony before the U.S. Congress, House Armed Services Panel on Future Uses of Manufacturing and Technology Resources, Oct. 24, 1991.

<sup>36</sup> The French have a centralized procurement agency, which has resulted in multi-Service procurements and better coordination of R&D investment. Nevertheless, critics allege that the agency has overemphasized industrial base considerations at the expense of military requirements and force readiness. See U.S. Congress, Office of Technology Assessment, op. cit., footnote 28.

<sup>37</sup> The F-111, originally designated the TFX (tactical fighter, experimental), began as a biservice program run by the Air Force to meet Navy fleet air defense and Air Force deep strike requirements. The differences between the two variants of the plane were to be minimal and the use of common parts was to be emphasized. Secretary of Defense McNamara believed that joint procurement and commonality would save the Nation about \$1 billion. In 1968, 7 years after the program began, Congress canceled the naval variant of the F-111, ostensibly because the effort to achieve commonality undermined the planes' ability to carry out their different missions and was not cost effective. See U.S. Senate, Government Operations Committee, Permanent Subcommittee on Investigations, *Hearings on the TFX Contract Investigation (Second Series)*, Part 1, Serial No. 43-096, Mar. 24, 1970.

<sup>38</sup> *Lessons in Restricting Defense Industry*, op. cit., footnote 2\*.

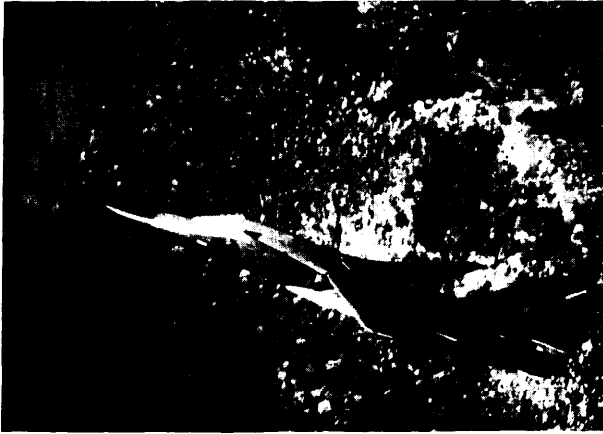


Photo credit: U.S. Department of Defense

Congress canceled the Navy's F-117 variant after an experiment in joint procurement and commonality with the Air Force failed.

in getting a particular weapons program into production.

Congress may also wish to reconsider its committee structure for overseeing the DTIB. Oversight of R&D, acquisition, and maintenance could be consolidated. Congress may wish to consider reducing the number of committees, subcommittees, and panels responsible for DTIB issues just as it calls on the DoD to be less top-heavy in its management of the base.

### Degree of Civil-Military Integration

The Federal Government's role as single buyer in the military market gives it enormous power to shape that market. In the past, the DoD has been such a large customer that it could establish unique and sometimes onerous requirements in accounting, manufacturing, and management and still be confident that sellers would step forward to seek its business. This heavy regulation has isolated the DTIB from the broader national base.

The burden of regulation was not financially crippling as long as the DoD market remained large enough on its own to support entire companies. But, excessive regulation will become a major obstacle to maintaining a healthy DTIB as the defense market shrinks and becomes less attractive to private firms.

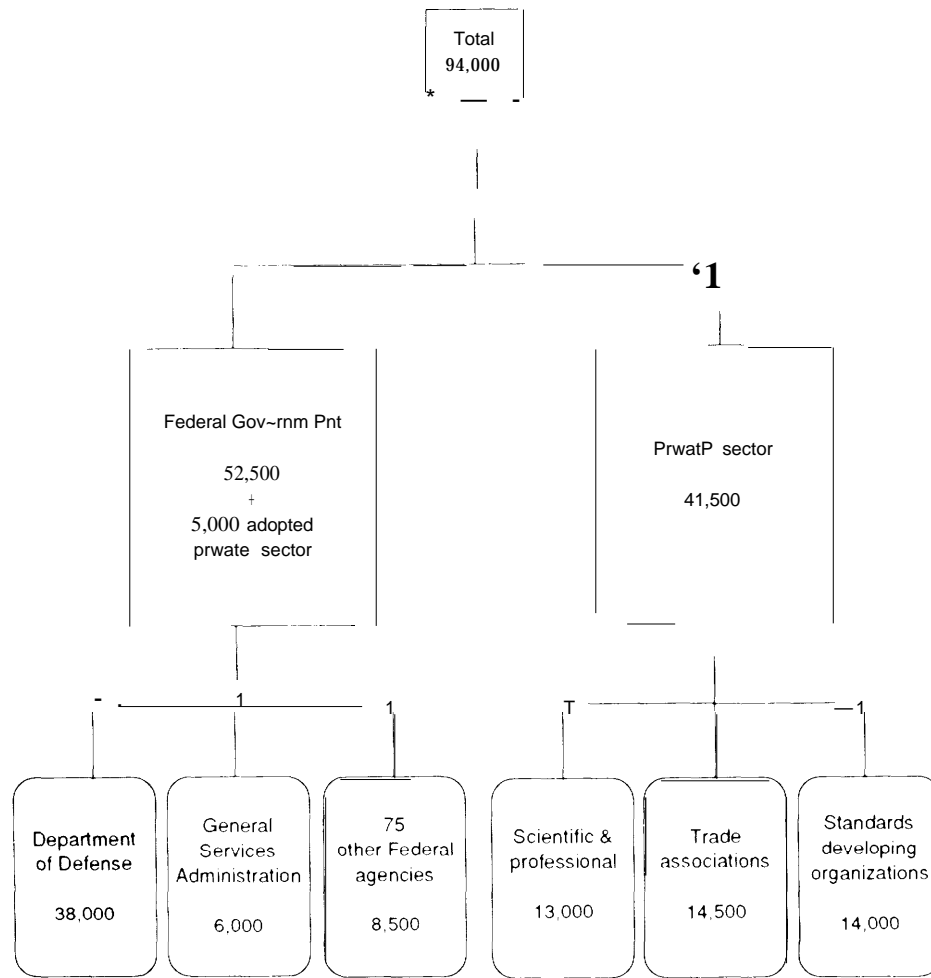
Integrating the defense base back into the larger industrial base will require changes. Reducing the amount of government oversight of firms' defense work is possible—but only in response to assurances that there is proper corporate accountability. Two general courses might be followed. One involves change within the current defense acquisition system. Examples include such programs as the Corporate Risk Assessment Guide (Crag) developed by the Defense Contracts Auditing Agency to reduce the number of on-site inspectors in key financial areas; the Exemplary Facility (EF) program, which has been tested in a number of manufacturing facilities in the past 2 years; and the Army's Continuous Process Improvement Program. While such programs have the objective of reducing oversight and therefore reducing costs, they all suffer from inadequate government support—especially a lack of support by relevant DoD oversight agencies—and a subsequent lack of industry incentive to participate. For example, the EF program was recently discontinued by OSD with little discussion with the companies involved. Future efforts to reform the acquisition system will require broad-based support within the DoD if they are to succeed.

The second course is to make much wider use of "commercial standards" in auditing and production, i.e., a broad, direct effort at increased civil-military integration of the base. This course offers greater potential benefits than limited change within the DoD system. For example, acceptance of commercial standards in place of military standards (e.g., replacing Mil-Q-9858A with ISO 9000) has been proposed by many in industry, but has not been acted on favorably by the DoD.<sup>39</sup> (See figure 6-6.) Even if this change were made, the DoD need for accountability would be different from that of the civil sector. Advocates of civil-military integration argue that, nonetheless, the regulatory barriers to doing DoD work should be lowered and more firms brought into the defense business, at which point accountability can be better assured through red competition.

Much of the burden of government accounting, auditing, and management regulations derives from

<sup>39</sup> ISO 9000 is shorthand for International Standards Organization (ISO) 9000-9004, a series of documents on quality assurance published by the Geneva-based ISO. The 5 documents outline standards for developing Total Quality Management and a Quality Improvement Process. 9000 consists of guidelines for the selection and use of the quality systems contained in 9001-9004. 9001 outlines a model for quality assurance in design, development, production, installation, and servicing. 9002 outlines a model for quality assurance in production and installation. 9003 outlines a model for quality assurance for final inspection and testing. 9004 is not a standard but contains guidelines for quality management and quality system elements.

Figure 6-6-U.S. Standards



SOURCE: Robert Toth, Toth Associates.

a desire to account for the actual production costs of weapons rather than the final price paid by the government, and to identify and punish cases of fraud, waste, and abuse. In principle, once a fair price has been established, the government should be satisfied with that price for future identical items. In practice, accounting oversight continues. Further, the laws and regulations governing accounting emphasize the potential for criminal sanctions to be imposed for what many in industry view as simple mistakes; these rules ultimately raise costs and encumber the acquisition process. In the past, Congress has been a major force behind these laws and regulations and may now wish to reconsider them.

Advocates of increased reliance on civilian business practices argue that market incentives would help control costs and maintain accountability. Manufacturers would be evaluated on their ability to produce items of agreed quality on time and at, or below, contract price. Military specifications would focus on desired performance and less on detailed manufacturing procedures. It might be important to continue specifying critical procedures (e.g., specialized welding), but such process specifications might be made advisory in many cases.<sup>40</sup> Defense contractors could be given more flexibility and responsibility in carrying out their obligations, allowing more efficient integration of commercial and defense facilities, equipment, and supplies,

<sup>40</sup> Caution must be taken to ensure that "advisory" specifications do not become *de facto* specifications.

which are now largely segregated, and reducing overhead spent on paperwork. The DoD has begun to test the effectiveness of commercial practices in lowering costs while guarding against abuse. It could widen such practices in the future.

The current Advisory Panel on Streamlining and Codifying Acquisition Laws is scheduled to report in January 1993. It is expected to provide insight into how Congress might best reform the vast body of acquisition law that was built up during the cold war.

### Improving Cooperation and Coordination

Combined government and industry action will be critical in managing the transition to a production base with the desired characteristics discussed in chapter 4. Unfortunately, as noted earlier, government-industry relations are often adversarial. Improved cooperation and coordination is needed not only between industry and the DoD, but also between the DoD and Congress and between Congress and industry.

This improved cooperation could begin in the planning phase. Industry needs to understand future defense requirements so it can prepare to meet them. To achieve such coordination, attitudes on all sides will have to change. Deputy Defense Secretary Donald Atwood has acknowledged the need for more cooperation and more industry participation in defense planning, noting that in the past it was considered "a crime if you [business] knew what we're going to do."<sup>41</sup> Since long-term DoD planning goals were classified, industry had difficulty preparing for the future. A more open approach is needed so all sides can make coordinated plans in a way that reduces any incentive to cheat.

### Talented and Experienced People

While program managers and contracting officers are certainly key players, management of the DTIB involves more than running acquisition programs. Future DTIB managers will have to make trade-offs among the three principal elements of the base (R&D, production, and maintenance), **while ensuring that the desired future DTIB capability will be available.** Dealing with these broad and basic questions demands experienced personnel.



Photo credit: Defense Systems Management College

A lecturer conducts a management course at the Defense Systems Management College.

"Revolving-door" laws make it difficult to attract talented and experienced people as senior civilian DTIB managers. These laws limit the post-government activities of appointees and require that they divest themselves of current stocks or commitments that might be a conflict of interest while they serve the government. Such disincentives to government service could be some even greater if a strategy of increased civil-military integration is pursued, since senior managers of non-defense firms might also be dissuaded from DoD service. Thus, while conflict-of-interest laws are essential, they might be reformed with an eye to attracting experienced private-sector managers to DoD jobs.

The quality of the Services' acquisition workforce has also been criticized. The principal problems appear to be rapid turnover among uniformed program managers, inexperience, and inadequate educational backgrounds. The defense Acquisition Workforce Improvement Act (DAWIA) sought to address some of these problems. The military has set up a Service Acquisition Corps and acquisition career paths. However, since over 90 percent of the personnel in the acquisition workforce are civilians,<sup>42</sup> programs to enhance military personnel are not enough to improve DTIB management. Greater efforts have to be made toward civilian managers.

<sup>41</sup>Deputy Secretary of Defense Donald J. Atwood, speech to a Technical Marketing Society of America Seminar in Arlington VA, reported in *Aerospace Daily*, June 3, 1991, p. 370.

<sup>42</sup>U.S. House of Representatives Committee on Armed Services, Report of the Subcommittee on Investigations, *The Quality and Professionalism of the Acquisition Workforce*, May 8, 1990, p. 14.



One problem is that civilian salaries lag behind military pay.<sup>43</sup>

DAWIA also provides for better training of acquisition personnel. The acquisition university, mandated by the Act is now being established. About 75 students per year will receive specialized acquisition courses at the Industrial College of the Armed Forces. Senior DTIB managers need training in how to maintain a “warm capability” involving tradeoffs among all three elements of the base, and how to manage a base that is more integrated with the civilian sector.

One approach to maintaining a cadre of technical managers, as well as a labor force, has been suggested by William L. Clark of the Defense Systems Management College. Training personnel at all levels could be accomplished by establishing a Civilian Technical Reserve Corps—a volunteer group of skilled defense engineering and production personnel who would take periodic ‘updating’ and retraining in their particular specialties. Some of this person-to-person training might be aimed at younger people to preserve generational continuity.

In case of a national emergency, a cadre of such trained individuals would greatly facilitate DTIB mobilization and, in particular, the transition of prototype systems to quantity production. A precedent for this kind of continuing education already exists in the medical profession and, to a lesser degree, in the legal profession. Volunteer reserve forces also exist in the military and the Peace Corps. All of these have successfully harnessed personal pride and patriotism to serve well-defined national goals. A Civilian Technical Reserve Corps would require participation by industry management, organized labor, and human resource experts.

## SUMMARY

For the Nation’s DTIB to remain strong and healthy in the future, it will have to be managed in new ways. There must be greater centralization in

planning, more flexibility in operation, and increased integration with the larger civilian technology and industrial base. **A coherent management strategy for the entire base (R&D, production, and maintenance) will be critical to halt the weakening of the present base and ensure that a “build down” rather than a “tear down” occurs.** Centralized strategy will need to be combined with decentralized operation, giving individual managers more responsibility and authority. Managers will have to make tradeoffs with respect to the entire base and not just a single element. DoD managers should have more flexibility in dealing with industry, and DoD contractors should have more authority to deliver products and services in a way that is most efficient for them and the base as a whole. These shifts will require experienced and talented management personnel—who will only be available if changes are made in training, career paths, and pay.

Sweeping reform of the acquisition laws and regulations will be essential to achieve the flexibility needed for restructuring. Congress might support programs that reduce direct government oversight, or change the oversight process radically and move to a more commercial environment. Such reforms should differ somewhat according to the industrial sector. Those defense sectors with more civilian overlap might best be managed according to civilian standards, while militarily-unique technologies will need more specialized management.

Finally, successful DTIB management will require better coordination and cooperation between government and industry and between the executive branch and Congress. Consensus on the role that the DTIE3 plays in national security is needed. If past inefficiencies are allowed to persist, the much smaller future base will be unable to provide the required support.

43 Ibid., pp. 480-487.