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## **Arsenal of Democracy in the Face of Change: Issues and Policy Options in Industrial Preparedness Planning**

**Working Paper No. 2**

David J. Bjornstad  
Barbara H. Hardy

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**ARSENAL OF DEMOCRACY IN THE FACE OF CHANGE:  
ISSUES AND POLICY OPTIONS IN INDUSTRIAL PREPAREDNESS PLANNING**

Working Paper No. 2

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and  
Barbara H. Hardy

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## ABSTRACT

This paper is one of a set of working papers that serves as background material to a FEMA-sponsored study of Industrial Mobilization planning. It identifies issues that will lead to policy alternatives in support of industrial preparedness. To do this, a simple framework cross classifying types of economic interaction between the DOD and the private sector, given peacetime, surge, and mobilization requirements. Next, policy recommendations from ten recent studies are examined. These came from a variety of different groups and focused on potential actions by DOD, FEMA, Congress, the Navy, and others. These are summarized and restated to match the cross classification framework. The planning framework is then used to organize a set of recommendations around three themes -- acquisition and public/private sector relationships, technology and factor input enhancing activities, and offshore sourcing and international competitiveness.

The DOD has already addressed the acquisition issue at great length and has implemented the bulk of its findings. These will undoubtedly increase the effectiveness and efficiency of its operations. It cannot, however, by itself fully rationalize the acquisition process so that incentives to achieve greater efficiency are fully passed on to contractors. DOD can, however, revise its acquisition process so that surge provisions are a deliberate step in the contract of each sensitive procurement, and could require a surge analysis for each action, steps that would highlight preparations for surge. DOD should consider the creation of a new institution similar to, but more generic than SEMATECH to handle its activities that directly enhance the defense industrial base. It should also support the creation of a body whose goal it is to identify non-neutralities in government policy. DOD should recognize that generic technologies supporting the defense effort are virtually indistinguishable from those that support the civilian economy. It should focus its technology efforts on supporting specific concepts that include both performance and producibility, as well as the technical skills needed to support them. DOD should continue to enjoy the economies gained from offshore sourcing, but should seek to document savings so that realistic tradeoffs can be evaluated. While supporting free trade, the government should seek to overcome instances of market failure, as in R&D support and technology transfer. It should also be attentive to trade barriers created by other nations. Finally, DOD should seek to integrate matters of producibility and resource cost more fully into decisions to develop, purchase and deploy weapon systems.



## I. INTRODUCTION

In January of 1985, the President's Commission on Industrial Competitiveness stated what many observers had long believed. The Commission concluded that "America's preeminence in world commerce has eroded over the past decade..[but that]..sustaining America's competitiveness is important for maintaining our standard of living, our foreign policy aims, and our national security."<sup>1</sup> Its work was summarized by the title of Vol. II of the Commission's report Global Competition: The New Reality.

The Commission admitted that competitiveness is an elusive concept when applied to a nation and that a single definitive measure is unavailable. However, by examining four key indicators -- labor productivity, real wage growth, real returns on capital employed in industry, and position in world trade -- and other measures, the Commission showed that the international economic order had changed and that, relative to other economic powers, was much less dominant in the mid 1980's than it was one or two decades earlier.

Since that time a cascading series of assessments has restated the Commission's concerns. Many have focused attention on the ability of the U.S. economy to provide a sound and responsive defense industrial base. Approaching the issue from an economy-wide view (e.g., President's

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<sup>1</sup> Global Competition: The New Reality, The Report of the President's Commission on Industrial Competitiveness, Vol. II, January 1985, p. ix.

Commission), a manufacturing sector level (e.g., Bolstering Defense Industrial Competitiveness), or a weapons system point (e.g., OJCS Joint Services Production Base Analysis: Precision Guided Munitions) has led to very similar conclusions--that the ability to multiply production in a surge or mobilization environment, or even in general support of the defense effort, has diminished substantially.

In addition to a pathogenic profile, each defense industrial base assessment has generated a diagnosis in the form of a set of policy recommendations designed to lead toward greater ability to surge, mobilize, or generally support the defense effort. These policies run the gamut of very general national policies (monetary and fiscal policies), to very specific national policies (subsidize specialized education), to trade issues (impose Buy American constraints), to the stockpiling of individual parts, materials or components that could bottleneck weapon system and end item production. Some policies implicitly call for increased defense spending while others seek to avoid new costs or to pass them along to contractors. Most call for the government in general and the DOD in particular to involve itself more heavily in the operation of the economy.

## **POLICY CONSTRAINTS**

The dilemma posed by these policy recommendations is that they run clearly counter to the policy findings of the President's Commission -- which call for less, rather than more, government involvement in the economy. On the one hand, it is clear that short-term industrial preparedness planning (IPP) demands involvement and sometimes direct intervention by DOD and its procurement system. On the other, it is equally clear that attempts at long-term management run

counter to the current national consensus on the appropriate role of government in the private economy. Moreover, larger defense budgets in the near future now appear unlikely, and based on past performance there is little to suggest that DOD and the Congress will team together to increase the share of the existing budget devoted solely to preparedness. Finally, not all suggestions have been consistent with the incentives provided by market forces. There is little use in requesting firms to take actions that are not in their perceived best interests.

Improving the defense industrial base therefore means developing and implementing policies that will do more using existing resources, in other words, that will generate greater economic efficiency. Developing such policies requires stating surge/mobilization goals explicitly and relative to other industrial base policies, separating instances of needed direct intervention from those where other options exist, realistically assessing the resource costs of implementing the various alternatives, and implementing policy options which balance short, mid, and long term needs. The methods chosen to implement the policies should provide consistent economic incentives for contractors to comply with the policy objective.

#### **PURPOSE AND ORGANIZATION OF PAPER**

The intent of this paper is to provide a very basic statement of these options and the economic impacts they entail. Discussion of the appropriateness of defense budget size and composition is avoided, and it is recognized that many independent efforts with similar goals are underway within and without DOD.

To provide such an analysis requires a simplifying framework and a statement of the system's underlying assumptions and objectives. This framework is presented in the following section. Section three reviews a number of policy proposals by other individuals and organizations and presents a summary of potential policy options. The options are then restated following the framework of section two and organized into a presentation of a surge, mobilization, and preparedness planning strategy. Options are arranged according to economic impact and whether they are aimed at improving defense capability during peacetime or at strengthening ability to surge or mobilize.

## II. AN ANALYTICAL FRAMEWORK

In simplest terms, the role of our military is to deter aggression and if deterrence fails to defeat an aggressor. The types of aggression the nation might face are diverse. U.S. war planners consider a range of conventional contingencies -- from support of client states to limited U.S. incursions to protracted conventional war. The ability to surge or mobilize is necessary to support all but the briefest of conflicts by permitting the nation to sustain military activities or to restock arsenals. It is, in principle, a handmaiden of all weapon and system deployment decisions, though in practice concerns about ability to surge or mobilize are frequently separated from planning and acquisition cycles.

Moreover, warplanning is a dynamic process in which past decisions are constantly being reviewed and revised. Because today's expenditures figure in future plans as well, dollars that support the ability to fight today compete with those supporting the ability to fight in the future. Defense expenditures that deepen the nation's arsenal (e.g., modernization) also compete fiercely with those that widen it (e.g., stockpiling and IPP). During periods of reduced tensions widening expenditures are highly disadvantaged in this competition, because there is less apparent gain from current capability and more from future capability. Spending for IPP and stockpiling is further disadvantaged because of the apparent belief that in times of severe threat Congress will provide sufficient resources to overcome any stockpile deficiencies. Decisions as to which policies should

be emphasized, however, are primarily policy decisions. Irrespective of particular choices, an efficient path should be followed.

A major activity of traditional IPP is the identification of bottlenecks and constraints in production. Mobilization planners argue that irrespective of the resources that would be made available in wartime, failure to prepare for surge/mobilization needs well in advance of calling for them will result in physical or technical barriers to increased production (bottlenecks), and institutional barriers to increased production (constraints).

#### **BOTTLENECKS AND CONSTRAINTS**

Bottlenecks result when firmly available redundant capability and materials are not close at hand. One issue frequently raised is the loss of production control in secondary tiers imposed by offshore production. A second is the lack of redundancy in onshore production facilities, and a third is the non-availability of certain material inputs from other than offshore sources. Opinions on the importance of bottlenecks differ among experts, and, with the exception of precision guided munitions, there are few data with which to resolve these differences.

Constraints occur when rules, regulations, and conventions adopted to achieve peacetime goals interfere with increased production in times of war. Examples of these range from inspection procedures intended to increase the shelf-life of weapons to contracting procedures intended to encourage competition, thereby reducing costs. The DOD is currently implementing a graduated

mobilization response (GMR) program that will, among other benefits, provide systematic relief from such constraints as the perceived threat increases.

### **DOD INVOLVEMENT WITH THE ECONOMY**

To understand the complex set of linkages through which international competitiveness and domestic economic health affect the defense effort, it must be recognized that DOD engages in a variety of transactions with the economy which often appear similar, but which involve very different kinds of economic decisions and therefore have different policy implications. To focus on these decisions and on criteria for evaluating a policy's economic efficiency and compatibility, these relationships have been divided into three, admittedly crude, levels: the firm level, the sector level, and the economy-wide level.

#### **Firm Interactions**

DOD makes its purchases of weapon systems, end items, and other materiel from firms. Relationships are governed by an exhaustive set of procurement guidelines, which seek to control costs and quality while creating opportunities for variety of suppliers to supply defense goods. An important outcome of the procurement process is that the system employed by DOD for promoting competition and preventing corruption shapes the character of the defense industry and therefore, the ability of the firms to meet surge or mobilization requirements. To a great extent DOD contractors have become specialized in meeting DOD requirements, rather than in meeting the needs of the civilian marketplace. In many instances there is almost complete separation between

defense suppliers and the commercial economy. Rigid control of contractor activities is typically maintained by DOD.

Thus, DOD exerts considerable influence over the choices firms make in meeting contractual obligations. By preparing contracts based on rigid MILSPECS and by overseeing each step of production DOD can provide disincentives for firms to be innovative and efficient. MILSPECS allow DOD to write contracts that provide explicit measures of performance and are of clear benefit in many instances. They can also, however, slow the rate of penetration of new technologies and hinder the ability to surge or mobilize.

The primary economic concern at this level is how to write contracts that provide firms with sufficient incentives and resources to behave in concordance with DOD goals. Ability to multiply production is one such goal that can be contractually secured. Avoiding bottlenecks, however, is costly and is often at odds with efforts by the procurement system to promote competition and to prevent illegal practices. This is because it encourages excess capacity and inventories and makes provision for firms to cooperate in ways that would ordinarily violate antitrust laws. It must therefore be an explicit policy concern if it is to occur.

### **Sector Interactions**

A second set of interactions takes place between DOD and what we term economic sectors. Here, DOD carries out activities to improve the capability of the industrial base to respond to the technical and production demands of planned and anticipated weapon programs. It does this by funding technology development and other means of factor input enhancement that are

independent of existing weapon and end item programs, but which provide a technical basis for developing new programs.

A primary reason that DOD interacts with sectors is to provide resources that individual firms are unwilling to purchase because of difficulty or uncertainty in recovering costs. A common example is R&D expenditures, where results, positive and negative, "spillout" to competing firms, often with little or no compensation. DOD therefore seeks to fund research which is focused on DOD programs and develops sector wide capability.

One means of overcoming the disincentives caused by spillouts is to create new institutions can serve the research/technology development needs of groups of firms. Private sector examples are the Electric Power Research Institute (EPRI) and the Gas Research Institute (GRI). These organizations "tax" members of their industries through a voluntary levy and use the proceeds to "create a market" in R&D for their respective industries. Their research dollars are spent for a range of basic and applied activities, sometimes in cooperation with government spending and sometimes in cooperation (e.g., on a cost sharing basis) with private sector firms. The important aspect of this arrangement is that firms voluntarily share R&D costs and benefits, rather than individually carrying out R&D and protecting the results to recoup their investments.

The DOD acquisition system has made it similarly difficult for firms in the defense industrial base to carry out R&D that is not closely linked to a contract. In recognition of this disincentive, DOD has created programs to provide R&D benefits to groups of defense contractors. One such program is the MANTECH program, which is intended to support the development of manufacturing technology; a second is the newly instituted SEMATECH program, which is intended

to support the domestic semiconductor industry.<sup>2</sup> Whereas each of these programs can help its sector to compete in commercial markets, each also targets critical defense components.

The administration of programs aimed at creating new technical knowledge is fraught with conflicts between supporting research that is truly independent of an existing activity or improperly using the program to supplement the funding of an existing activity. The Manufacturing Studies Board summarizes this problem by arguing that DOD has often used MANTECH to develop product technologies rather than process technologies (1987). Short-term, specific problems are addressed at the expense of longer term, more generic problems. One solution is to remove control over funds from those with project responsibility. The Manufacturing Studies Board highlighted this problem in its call for using the DOE National Laboratories as an institution to organize research within the semiconductor industry. This concept came partially to fruition in the formation of SEMATECH. However, SEMATECH falls administratively under the DOD which has led critics to suggest that defense considerations may shape its activities more than is desirable.

The economic health of sectors is more closely tied to domestic economic well-being and foreign competitiveness. It can not, however, be managed through the same type of contractual relationships as direct purchases, nor is it subject to the same direct control by DOD.

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<sup>2</sup> The Manufacturing Studies Board published reports on both MANTECH and SEMATECH in 1987: Manufacturing Technology: Cornerstone of a Renewed Defense Industrial Base, and The Semiconductor Industry and the National Laboratories: Part of a National Strategy. Both are discussed in this paper.

### **Economy-Wide Interactions**

The broadest set of economic impacts that DOD imparts are those that affect the economy as a whole. Included in these activities are a variety of actions, such as basic physics research or fundamental education programs.

More specifically, however, they concern how DOD might influence national economic policy and how DOD might communicate its vital interests to the civilian agencies of government and thus potentially influence the policies these agencies pursue. For example, DOD might screen all potential economic policies under consideration by other agencies of government, rank them according to their potential strategic importance, and conduct analysis to demonstrate how security would be affected by policy alternatives.

At this level, economic well-being and international competitiveness are most directly applicable to the defense effort. However, the linkages are indirect, the payoffs long-term, and the ability to exert control, minimal. It is at this level that the fundamental capability of the economy reigns.

### **WEAPONS USE AND PURCHASE DECISIONS**

Although it is possible to overstate the case, most decisions to purchase, deploy, and use weapons systems are performance-oriented, rather than production-oriented. This is manifested in a tendency to avoid tying IPP to operations plans, considering producibility in decisions to purchase particular systems, and matching long term technology development with long term weapon

planning. To the extent that this is true, a valuable type of information is lost and the effectiveness of the warplanner and warfighter is decreased.

Despite the tendency to avoid using supply-type information in this decision process, it has always been clear that once in the field, tactics are limited to existing stocks and the ability to replace them. Current exercises, such as Global War Game 88<sup>3</sup> have reinforced this and introduced ability to surge as a limit to more general strategies. A potentially important contribution in this area is being made by the Joint Industrial Mobilization Planning Process (JIMPP).<sup>4</sup> Among its other features, JIMPP focuses attention on how the ability to surge or mobilize can constrain the ability to fight. Although a primary JIMPP aim is to point out instances where IPP can improve the ability to fight, a natural offshoot is to place greater emphasis on using supply information in decision-making. Further efficiency gains are available by using supply information in decisions about overall weapon choices, design, and manufacturing techniques.

## SUMMARY

In summary, DOD interactions with the economy can be divided into three categories--the firm, the sector, and economy-wide levels. At the firm level, DOD writes contracts and enjoys hegemony. It enjoys less autonomy at the sectoral level, and has sought out new institutions to

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<sup>3</sup> John R. Brinkerhoff, Global War Game 88: Some Lessons Learned, Federal Emergency Management Agency, December 6, 1988.

<sup>4</sup> JIMPP: Concepts, Development Strategy, and Cost, JCS Working Paper 88-2, Preliminary Draft, March 10, 1987.

carry out its activities. At the national level, its impacts are largely indirect and can perhaps best be channeled through the civilian departments and agencies. Effective planning for surge and mobilization must consider these levels and move beyond its typical focus on the firm level.

To organize the transition between differing economic response to different levels of threat, the above noted Graduated Mobilization Response (GMR) concept has been developed.<sup>5</sup> This concept divides DOD response to the state of the world into three regimes -- business as usual, surge, and mobilization -- and each regime into subcomponents. In principle, these regimes would follow the DEFCON practice whereby a change in external conditions triggers a change in DEFCON level which in turn changes the state of force readiness. Movement from GMR 3 (business as usual) upward triggers similar response within the defense industrial base and the agencies of government that deal with it.

Combining the GMR concept with the different aggregate levels of the economy with which DOD has involvement yields a format for cross-classification of proposed policies to improve the ability of the economy to perform during peacetime conditions or in response to a need to surge or mobilize. This is summarized on Figure 1. Note that as one moves from the national economy to the firm, direct control by DOD and/or its agents increases. Similarly, as one moves from peacetime to surge or to mobilization direct control and involvement increases.

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<sup>5</sup> National Emergency Training Center, Workshop: Planning for Graduated Mobilization Response (GMR), Emmitsburg, Maryland, October 5-6, 1987.

GMR

		3	2	1
Level	National	l , L	l , M	h , H
	Sector	l , M	m , M	h , H
	Firm	h , H	h , H	h , H

Level of DOD direct involvement (L, M, H)

Level of direct control by DOD, other government, or Agent (l, m, h)

Fig. 1. Cross classification with economic levels and GMR.

### III. REVIEW OF RECOMMENDATIONS BY PREVIOUS STUDIES

The many studies of the defense industrial base have been carried out on behalf of a variety of different groups, each with unique perspectives and interests. The studies thus tend to emphasize concerns and recommendations of special relevance to the sponsoring agency. Yet despite the diversity of recommendations, there is a remarkable similarity among the conclusions presented. In this section, the recommendations presented in ten recent studies are reviewed. They are then assembled into a single, comprehensive list, admittedly omitting a good deal of thoughtful work that underlies them. The list is representative in the sense that it contains a diversity of sponsoring bodies and viewpoints, but it is far from comprehensive and may not be balanced.

Table 1 lists the studies, all of which were completed during the past two years. The first report, by the Undersecretary for Defense/Acquisition (USD/A), is a major piece of work which introduces a number of new concepts in the procurement/planning process, and reaffirms a number of existing concepts. It is complemented by the eighth and ninth studies, carried out by the Manufacturing Studies Board of the National Academy of Science are carried out on behalf of the Office of the Secretary of Defense (OSD). In contrast to the first, these two consider longer term strategies for defense industrial base development, as does the second study which was prepared by the Office of Technology Assessment.

Table 1. Selected recent studies of the defense industrial base

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1. Office of the Secretary of Defense, Undersecretary for Acquisition, Bolstering Defense Industrial Competitiveness, July 1988.
  2. Office of Technology Assessment, The Defense Technology Base, March 1988.
  3. The Air Force Association, Lifeline in Danger, Aerospace Education Foundation, September 1988.
  4. American Defense Preparedness Association, The Ammunition Industrial Base, January 1988.
  5. Center for Naval Analysis, Options for Improving Naval Industrial Preparedness Planning, August 1988.
  6. Libicki, Martin C., Industrial Strength Defense, Mobilization Concepts Development Center, National Defense University, 1988.
  7. The Analytic Sciences Corporation, "Affordable Strategies to Ensure Industrial Responsiveness," Federal Emergency Management Agency, March 1987.
  8. Manufacturing Studies Board, Manufacturing Technology, National Academy of Science, 1987.
  9. Manufacturing Studies Board, The Semiconductor Industry and the National Laboratories, National Academy of Science, 1987.
  10. Ellison, John N., and Timothy W. Stanley, "America's National Security and the Vanishing Mobilization Option," International Economic Studies Institute, October 1987.
-

The second report was carried out by the Office of Technology Assessment. It sought to provide guidance to Congress on how Congressional actions affecting technology would feed through to the defense industrial base. The third and fourth studies are carried out by lobbying groups, and the fifth was carried out for the Navy by its research arm, the Center for Naval Analysis. The sixth is a product of the National Defense University and the seventh and tenth are sponsored by FEMA.

It is noteworthy that the various studies contain recommendations which span the three levels of economic impact and the three GMR stages discussed in Section II. In the following section, the summarized recommendations are reorganized according to these categories.

#### **RECOMMENDATIONS BY ORGANIZATION**

Of the works considered here, Bolstering Defense Industrial Competitiveness (BDIC) is perhaps the most potentially important document, because it is a statement by a component of the Office of the Secretary of Defense (OSD) as to what OSD policy should be. Moreover, in the most recent DOD Report to Congress for FY-1990, Frank Carlucci, the Secretary of Defense, ratified nearly all of its recommendations. Virtually all were actions DOD could take independently.

There are a total of nineteen recommendations in the study but for brevity, we have combined them into eight for this discussion. These are presented in Table 2. By considering this document first, we avoid discussing many of the recommendations in subsequent studies, with the recognition that many of the other reports preceded the OSD report temporally.

Table 2. Summary of recommendations from  
Bolstering Defense Industrial Competitiveness

---

1. Forge "right" relations with industry.
  2. Improve the acquisition system.
    - incentives for modernization
    - increase program stability
    - reduce use of MILSPECS
    - seek program funding stability
    - employ life cycle costing
    - ensure quality control
  3. Establish defense industrial strategic plans that support military operations plans and analytical tools to support them.
  4. Develop manufacturing capabilities concurrent with the development of weapon systems and separately develop generic technologies.
  5. Improve the technical skill base of the labor force.
    - incentives to industry
    - incentives to educational institutions
  6. Ensure that the industrial base benefits from as full a spectrum of governmental policies as possible.
    - tax policies
    - trade policies
    - other civilian agency policies
  7. Establish office of "production base advocate"
  8. Ensure the visibility of foreign source dependencies.
-

The first recommendation, improving relations with industry, sounds somewhat amorphous, but is intended to establish two additional advisory boards to interact between DOD and industry. The first, the Defense Manufacturing Board, has been established as an arm of the OSD, and the second, the Manufacturing Studies Committee, has been organized by the National Academy of Science in a manner parallel to the Board. In addition, a new Deputy Undersecretary for Industrial and International Programs has been established as a "production base advocate," per recommendation seven.

The second recommendation, to improve the acquisition system, poses an enormous challenge. The question is how to meet governmental goals for integrity, equity, and quality, while providing incentives that lead to private sector to be innovative and efficient.

The third recommendation seeks to link operations plans (war plans) with industrial planning, basically a fleshed out graduated mobilization response. Note that here, and below, recommendations seek to make supply responsive to demand. We argue that in addition the converse should be considered. In other words, performance and producibility should be systematically compared.

Recommendations four, five, and six seek development of capability. Four suggests keying R&D to production, as well as performance. Five deals with the skills of the labor force. And six deals with tax, trade, and other civilian agency policies concerning improving the ability of U.S. manufacturing activity to compete internationally. It is this sector which BDIC regards as the core of reform for the U.S. defense industrial base. Finally, eight raises a theme that will be repeated

in numerous other studies, to ensure the visibility of foreign source dependencies. The production base advocate will presumably be the DOD point of contract if recommendations four, five, six and eight are implemented.

Table 3 contains two generic recommendations to Congress by the Office of Technology Assessment and a number of related issues that Congress must consider. Two issues are of note here that differ from BDIC. First, it is suggested that technologies supporting military and commercial innovations are largely inseparable, so that policy must deal with both. This highlights the important, though not unique interest of DOD in generic R&D. The second issue is that apart from technology development, issues in technology deployment (technology transfer), particularly delays in technology deployment, may negatively affect the defense industrial base. Here DOD may have a more predominant role.

The recommendations in Lifeline in Danger (Table 4) are similar to those just mentioned, but provide different emphases. Here, reductions in foreign source dependency are strongly called for. It is also suggested that prime contractors should take additional responsibility for nurturing their subcontractors. By this recommendation, it is argued that prime contractors typically provide the same disincentives to their subcontractors to invest and innovate that is criticized in the DOD acquisition system.

The Ammunition Industrial Base (Table 5) also contains suggestions addressed above and again calls on industry to respond to government actions. One should bear in mind that these latter two studies were undertaken by industry groups which perhaps wish to emphasize the need and willingness for their constituencies to cooperate with DOD policy initiatives.

Table 3. Summary of recommendations from  
The Defense Technology Base

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1. Congress should ensure that government programs affecting the defense industrial base are appropriately staffed, managed, and funded.
2. Congress should ensure that government policies toward industry support the existence and maintenance of a healthy technological base.

These require addressing a number of sub-issues:

- The military and commercial components of the technology base are largely inseparable so that policy must deal with both.
  - Despite the attention given the DOD management system, its efficacy and ability to maintain a highly trained staff is unproven, and it is disadvantaged by salary structures and restrictions on mobility.
  - R&D support by Congress is vulnerable to swings in tax revenues and other popular issues.
  - Questions have been raised about the efficacy of government laboratories.
  - Foreign source dependency is growing.
  - DOD/government regulations, MILSPECS, and adversary relationships between DOD and industry reduce efficiency.
  - There are disincentives for government contractors to modernize or innovate.
  - The technical skills of the labor force are inadequate.
  - Many delays in innovation are caused less by the lack of new technology than the slow rate at which technologies are transferred and deployed.
-

Table 4. Summary of recommendations from  
Lifeline in Danger

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1. While complete independence from foreign suppliers is impossible, the U.S. should reduce its dependence on suppliers of critical components.
  2. Congress should rationalize current rules and regulations that provide disincentives for defense contractors to innovate and achieve high efficiency.
  3. Large prime contractors should take steps to support their subcontractor base.
  4. A Presidential Commission should undertake a comprehensive analysis of the defense industrial base and prepare a national plan.
- 

Table 5. Summary of recommendations from  
The Ammunition Industrial Base

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1. DOD should establish itself in a leadership role in supporting the defense industrial base by developing coherent plans, programs, and a budget.
  2. DOD should establish closer ties with industry in playing this role.
  3. DOD should modify its application of the Competition in Contracting Act to reduce foreign source dependence and in doing so should provide more favorable incentives for industry to innovate and develop.
  4. Industry should respond with more innovation, investments, and other actions that would promote readiness.
-

The Naval study (Table 6) is differentiated from the others by its focus on Navy, rather than DOD or Congressional, policy. It recommends the Navy limit its IPP focus largely because of funding constraints, though its recommendations are remarkably similar to the other studies. It suggests IPP should be driven by the Critical Items List, account for lags in new production vis a vis inventories, and avoid unproductive expenditures that do not result in Navy policy actions, such as collecting data that do not directly drive policy decisions.

Martin Libicki makes the case that surge planning should be at the heart of mobilization planning (Table 7). This, he argues, will provide the maximum benefit to IPP, because consideration of the ability to surge would be an integrated part of the acquisition process. Using the precision guided munitions data base (PGM) assembled through a series of studies by the Navy, the Office of the Joint Chiefs of Staff, the Center for Naval Analysis and the National Defense University, Libicki concludes that the rate at which production increases occur depend upon the degree to which peacetime institutions remain in place. He argues that with peacetime constraints removed, rapid increases in production can occur with modest outlays to overcome bottlenecks and urges that surge provisions be incorporated in all key acquisition decisions. He additionally makes a number of suggestions similar to those discussed above such as encouraging greater integration of the defense and commercial markets.

Table 6. Summary of recommendations from  
Options for Improving Naval Industrial Preparedness Planning

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1. The Navy should develop criteria for critical items using the Commanders-in-Chiefs Critical items list and restrict Navy IPP to those systems and items.
  2. The Navy should ensure that operations plans account for on-hand inventories as well as the time lag required to increase production to meet use rates during wartime.
  3. The Navy should consider following the lead of the Army and Air Force in making acquisition managers responsible for IPP.
  4. Although, the Navy should not expect contractors to carry out planning or other information gathering activities that are uncompensated, the Navy should not pay for planning or data that lead to no action.
- 

Table 7. Summary of recommendations from Industrial Strength Defense

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1. Centralize DOD IPP planning to take into account that the military services have similar needs and will require more industrial capacity in times of crisis than a study by a single service would show.
  2. Make surge planning the core of IPP by integrating operations plans and strategies with production targets.
  3. Use surge targets as criteria for making judgments about contractor investments; integrate surge provisions in all procurement actions.
  4. Undertake long term planning and modify incentive structure to make greater use of the commercial sectors in defense acquisition and at the same time encourage defense producers to enter commercial markets.
-

The TASC report on "Affordable Strategies..." (Table 8) provides detailed information on the use of standby agreements to develop capacity for surge/mobilization. A standby agreement is a contractual agreement between the DOD and private firms in which the private firms agree to provide specific goods and services to help meet surge or mobilization requirements. It also outlines a basis for developing voluntary agreements among contractors. Voluntary agreements are associations of contractors granted antitrust relief to engage in defense-supporting agreements that would otherwise risk antitrust prosecution. To a much greater degree than the other reports, the TASC study focuses on implementation.

The National Academy of Science study of MANTECH (Table 9) emphasizes the need to invest dollars in generic R&D apart from on-going weapons programs. The major thrust of the report is to advise DOD to resist the pressures to reprogram generic R&D funding into specific R&D funding as budget pressures mount. The report also warns against improperly drawing funds budgeted for generic research into on-going programs when budgets become tight. This report was a major basis for the recommendation discussed above concerning establishing linkages between future weapons strategies and the technology needed to manufacture them.

The second National Academy Study (Table 10) proposes using the Department of Energy's national laboratories as a resource in semiconductor technology development. They would engage in cooperative research with the private sector and encourage technology transfer. It is interesting

Table 8. Summary of recommendations from  
"Affordable Strategies to Ensure Industrial Responsiveness"

---

1. Use standby by contractual agreements to develop industrial capacity for surge/mobilization.
  2. Provide the basis for developing voluntary agreements among groups of defense contractors by waiving anti-trust provisions and other institutional constraints.
- 

Table 9. Summary of recommendations from Manufacturing Technology

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1. More funding should be directed at the MANTECH program as a way to focus DOD attention on improving manufacturing technology that strengthens the defense industrial base.
  2. Guard against using MANTECH funds to supplement R&D for on-going systems development and production.
- 

Table 10. Summary of recommendations from  
The Semiconductor Industries and the National Laboratories

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1. Create a national organization or committee that would set a national agenda for semiconductor research.
  2. Develop mechanisms to make use of the resources and staff of the Department of Energy's national laboratories through cooperative research ventures and technology transfer.
-

that the study focused more on the resources contained in the National Laboratories than on their non-profit nature which could potentially allow them to play a role similar to EPRI or GRI as was discussed above.

Finally, a FEMA-sponsored study (Table 11) calls for a major reevaluation of mobilization options and priorities with emphasis on counteracting the "hollowing out" of the defense industrial base. The report recommends establishing an organization parallel to the National Security Council to oversee this, with FEMA the action arm of the organization. Under this arrangement FEMA would obtain additional mandate and analytical resources to carry out research and interact with the civilian agencies and DOD.

Table 11. Summary of recommendations from  
"America's National Security and the  
the Vanishing Mobilization Option"

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1. Re-evaluate options and priorities concerning mobilization, with one option being a plan to counteract the "hollowing out" of the defense industrial base.
  2. Establish an organization parallel to the National Security Council to participate in the review and coordinate the implementation of the priorities.
  3. Assign FEMA as the action arm of the new organization with mandate and resources to carry out research and interagency programs with the civilian agencies.
  4. Conduct additional analyses focusing on readiness impacts of policy actions of civilian agencies, options to correct bottlenecks, and "endangered industries."
-

## **SUMMARY OF RECOMMENDATIONS**

Once the overlap among these ten studies is removed, the recommendations can be summarized in seven categories. This is done in Table 12. Many of the recommendations have already been put into place, and these are denoted in Table 12 with an asterisk.

The first category of recommendations concerns planning and information exchange mechanisms. DOD has already adopted and begun to implement several of its own suggestions, though they have been in place too short a time to evaluate. For example, GMR implementation is complex, will require cooperation from a number of groups, and is dependent on gathering appropriate data.

The second category groups a number of surge-related recommendations. The first recommends linking war plans to productive capacity. This task is difficult because the data needed to carry it out has not been collected or organized.

The third category of recommendations has to do with mobilization planning. Very little has explicitly been stated in these studies about mobilization, though implicitly many of the concerns raised about the overall performance of the national economy relate to the ability to mobilize. Many studies discuss pre-arrangements, such as the voluntary agreements which were in place but not used during the Vietnam buildup.

The fourth category of recommendations deals with national industrial policy to enhance the defense industrial base. To some extent, analyses of policy impacts on the defense industrial base

*Arsenal of Democracy in the Face of Change: Issues and Policy Options  
in Industrial Preparedness Planning, Working Paper No. 2.*

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Table 12. Summary of recommendations

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1. Planning and Information Exchange
  - a. Create a national agenda for surge and mobilization strategy
    - Review role of surge/mobilization on defense strategy
    - Review assignment of policy/action roles among agencies and within DoD
  - b. Create new DOD institutions
    - Advisory bodies\*
    - Production base advocate\*
  - c. Create internal DOD mechanisms to coordinate policy and action
    - GMR\*/JIMPP\*/DINET\*
2. Surge Planning
  - a. Establish link between war plans and production capacity
  - b. Estimate additional capacity needs under policy assumptions
  - c. Provide surge capacity/inventories through existing contracts
3. Mobilization Planning
  - a. Establish voluntary and standby agreements
4. National Industrial Policy
  - a. Labor training in schools and on-the-job
  - b. Conduct impact analyses of tax policies to support defense industrial base
  - c. Conduct impact analyses of trade policies on defense industrial base
  - d. Conduct impact analyses of other civilian policies and activities industrial base
5. Dependence on Offshore Sources
  - a. Provide information to identify offshore dependencies, focusing on tiers\*
  - b. Consider how to reduce or offset vulnerability
    - Prohibit or limit offshore purchases
    - Stockpile offshore components
    - Subsidize domestic producers
6. Improvements to Acquisition System
  - a. Increase stability of multi-year funding
  - b. Reduce use of MILSPECS, increase use of commercial components\*
  - c. Use life cycle costing\*
  - d. Ensure quality control\*
  - e. Provide better incentives to producers
    - To modernize/invest; to cut costs; to conduct R&D
7. Technology Policy
  - a. Incentives for contractors to innovate
  - b. Evaluate and support defense sector specific technology as through MANTECH
  - c. Evaluate and support generic technology base, as it may support defense

---

\*Adopted by DOD

are now being carried out, but there is no systematic, integrated effort underway. More importantly, it is well understood that the numerous laws, rules, and regulations promulgated by the Federal Government have a decided effect on the ability of the economy to meet mobilization goals, but a systematic review of these effects has never been undertaken.

The fifth category of recommendations deals with dependence on offshore sources. This dependence is a sensitive issue, both because it can cause vulnerabilities and because to some it represents a potential policy response to what has been characterized as an erosion of the industrial base. Three sorts of vulnerability have been identified. One concerns the ability to maintain supply lines, the second concerns the ability to achieve cooperation in times of crisis and war, and the third deals with potential loss in technological leadership that can result from allowing offshore firms to access/develop defense technologies.

The sixth category of recommendations has to do with improving the DOD acquisition system. Several of the suggestions to improve the acquisition system have recently been adopted, but most have continued the tradition of DOD providing strict instructions to contractors regarding not only outputs but virtually all aspects of the production process.

The seventh recommendation concerns technology. Technology policy permeates nearly all aspects of surge and mobilization planning. Providing incentives for contractors to invest and conduct R&D, while part of acquisition, also concerns how new technologies become imbedded in the capital stock.

#### IV. A FRAMEWORK FOR SURGE, MOBILIZATION, AND PREPAREDNESS POLICY OPTIONS

The summary of recommendations from Table 12, combined with the conclusions of Section II, provides a logical order for considering policy options and their systematic analysis. This can be addressed in three parts.

##### A PLANNING FRAMEWORK

The first part concerns an overall planning framework, for which we will rely primarily on the concepts introduced in Figure 1. In simple terms, Figure 1 indicated that the government pursues policies that are focused on firms, sectors, and the entire economy, for the purpose of producing weaponry and materiel. Each policy was associated with a state of the world--business as usual, heightened tensions accompanied by surging some or many systems or items, and mobilization.

These distinctions support planning and preparedness activities rather than actual acquisition. Irrespective of the state of the world, when the DOD acquires weapons and materiel, it does so directly through agreements with individual firms. Hence, actions aimed at the sector or economy-wide levels, though intended at least in part to support preparedness, take place during peacetime. With this in mind, Figure 1 implies that in moving from the firm upward, the planning horizon lengthens, the degree of direct control diminishes, and the degree of DOD involvement lessens.

With this broad approach, it is possible to examine three issues areas identified below--- acquisition, technology, and offshore sources -- systematically. In doing so, it is useful to broaden them slightly: acquisition will include all institutional aspects of public-private sector interaction, technology will include the enhancement of all factors of production, and offshore sourcing will generally deal with the opening of the world economy.

#### **POLICIES DEALING WITH ACQUISITION/PRIVATE SECTOR INTERACTIONS**

Table 13 presents the recommendations discussed above within this framework. When dealing with firms, it is recommended that DOD adopt and implement all BDIC acquisition-related recommendations. In fact, this process is already underway and requires no action outside of DOD.

The second recommendation would require outside actions, and likely new legislation, because it would direct procurement policy at providing innovative management, modernization, and use of off-the-shelf items in an all out effort to reduce costs. Current policy is to foster competition among prime contractors, provide a "level playing field" for new entrants, and hold profits down. A new policy would effectively exclude some potential participants, make profits dependent on performance, with quality and costs the determinants of success, and reduce emphasis on competition among prime contracts, while providing prime contracts with the strongest incentives to promote competition among their suppliers. These recommendations primarily serve the peacetime environment.

Table 13. Acquisition/private sector interactions

---

Firm

-Peacetime

1. Implement BDIC Recommendations
2. Modify subcontract process to provide incentives to reduce costs through innovative management, modernization and utilization of off-the-shelf items

-Surge

1. Modify subcontract process to include explicit surge provisions
2. Expand potential group of suppliers by modifying subcontract process to utilize off-the-shelf items

-Mobilization

1. Develop innovative information system/expert system via DINET/JIMPPS to identify key relationships
2. Develop voluntary agreements to pursue key relationships

Sector

-Peacetime

1. Establish grand structure of semi-autonomous institutions to deal with sectors under DOD guidance

-Surge

1. Provide mechanism for stable funding of institutions
2. Review FEMA policy guidance for congruity with DOD acquisition policy, e.g., key worker protection

Economy-wide

-Peacetime

1. Assign responsibility for monitoring National Industrial Policy Impacts to civilian agencies and establish conduit for DOD input.

-Mobilization

1. Review FEMA policy guidance for congruity with DOD acquisition policy, e.g., potential for spontaneous evacuation
  2. Pursue macro policies that promote goals
-

To promote surge, the acquisition process should include explicit provision for surge in each "qualifying" contract and incorporate a "surge analysis" much as PPBS budget process now requires benefit-cost analysis at certain junctures. Decision-makers should always have the option to not fund surge capacity, but it should be an explicit decision. Adopting the above mentioned recommendation to use off-the-shelf items wherever possible would contribute substantially to surge capacity because it would automatically incorporate into the surge base capacity devoted to civilian markets during peacetime. The incentive to do this is so strong, that DOD should consider trading some performance features to gain this costless capacity.

The ability to prepare for mobilization at the firm level is very limited. It should be restricted to information gathering, using innovative computerized techniques now available. This information could be used to form voluntary relationships, while recognizing that there will be limited payoffs to doing so.

At the sectoral level, DOD should foster the creation of one or a set of semiautonomous institutions that could promote technologies and other matters that directly benefit the industrial base. It should avoid forming special purpose bodies, such as the Department of Energy's Solar Energy Research Institute to foster flexibility as mission emphases change. Using the national laboratories, as was suggested by the National Academy of Science, should be considered. Funding for these bodies should be stable.

DOD should also coordinate its surge policy needs with the policies of other agencies using the GMR as a format. FEMA should act as the central point of contact for the civilian agencies, though other agencies, particularly the Department of Commerce would be intimately involved.

At the national level, a formal national industrial policy task force should be established to ascertain the impacts of all government policies on competitiveness, efficiency, and international relations. The non-neutrality of government policy has been so well documented that the need for this should not be in dispute.<sup>6</sup> The initial task of this body should be not to form new policy, but to ascertain what current, implicit, policy is.

In parallel, DOD and FEMA should undertake to resolve any differences between their policies and interpretations of people's behavior, were a national emergency to arise. For example, FEMA often assumes that during a crisis that might lead to nuclear war, spontaneous evacuation would take place, and has designed policies to accommodate this, while DOD is planning on workers remaining at their stations, as they did during WW II. Macroeconomic policies that promote a transition to a wartime economy and back to a peacetime one, should be developed.

Finally, the DOD should continue with its trend of incorporating more cost and producibility information into decisions about developing purchasing, and deploying weapons systems, much as it now recognizes barriers due to surge capacity. This would add to efficiency without reducing defense capability.

---

<sup>6</sup>Alan Blinder has recently summarized many of the arguments concerning the many small decisions and policies that reduce economic efficiency in his book Hard Heads Soft Hearts: Tough-Minded Economics for a Just Society.

## **POLICIES DEALING WITH TECHNOLOGY AND FACTOR ENHANCEMENT**

The primary goal of peacetime interactions between DOD and its contractors should be to achieve efficiency in light of goals. Hence, policies should provide incentives for firms to adopt cost savings technologies with a minimum of red tape and a minimum of DOD supervision. As an input to preparedness decisions, DOD should routinely collect and evaluate cost savings obtained through offshore sourcing.

At the sectoral level, DOD should revitalize the MANTECH program by carefully targeting technologies that promote its goals. MANTECH should be broadened to include consideration of congruency of labor skills with technological requirements and to consider producibility as a goal of technology development. Once again, DOD should be prepared to trade off producibility and performance. Costly, high tech systems to promote surge and guard against bottlenecks should also be pursued. An excellent example of the latter offering great potential is the flexible manufacturing system. The Department of Commerce currently prepares analyses of strategic industries to determine if some form of protection is justified. Provisions of Executive Order 12656 to strengthen and broaden participation in this activity should be supported strongly.

DOD should recognize that at the national level, its technological needs are difficult if not impossible to separate from those of the civilian sector. It should therefore participate in, but not

lead, efforts to support technical and other educational activities, conduct analyses of national impacts of tax, trade and other civilian policies.

### **OFFSHORE SOURCING/INTERNATIONAL COMPETITIVENESS POLICIES**

Offshore sourcing has provided savings during peacetime, and DOD should continue to take advantage of this source of savings. DOD should, however, seek to evaluate exactly what this savings is, so that it can determine the advantages it receives. It should also seek to ensure that channels to offshore sources are secure. It has a variety of ways to do this, by choosing the location of its suppliers or fostering production in more secure areas. It may also use a technological fix, such as stealth technology, to ensure lightweight high value components can be transported during conflicts. As part of securing channels, it should satisfy itself that manufacturers would be willing to cooperate during times of stress.

If offshore sourcing is sufficiently cost saving, DOD should investigate ways to reduce vulnerability that include stockpiling, flexible manufacturing systems, and other means to ensure bottlenecks do not occur.

DOD should also seek to coordinate its sectoral policies in ways that remove artificial disincentives and deal with market failures, as the disincentives individual firms face in investing in certain types of R&D. It should likewise support national policies which do this. Beyond this, there it should be recognized that free trade will generally promote economic efficiency. Any departures should be by exception, for example, in response to trade barriers by foreign powers or to accommodate pressing matters of national security.

Table 14. Technology and factor enhancement policy options

---

Firm

-Peacetime

1. Seek to encourage cost-saving technology transfer/deployment using incentives in place in acquisition system
2. Evaluate strategic value of secure technologies subcontracted offshore

Sector

-Peacetime

1. Revitalize MANTECH program to target strategic technologies in which firms would not individually invest
2. Encourage technology transfer using centers
3. Conduct impact analyses of specific tax, trade, and other policies on specific defense-sensitive sectors

-Surge

1. Expand MANTECH to include producibility, e.g., flexible manufacturing systems

Economy-wide

-Peacetime

1. Support educational institutions
2. Conduct impact analyses of tax, trade and other civilian agency policies for impacts on industry

-Mobilization

1. Review policies of civilian agencies for congruence with defense plans
-

Table 15. Offshore sourcing/international competitiveness policies

---

Firm

Peacetime

1. seek economies through use of low cost producers
2. identify offshore sources and evaluate savings

Surge/Mobilization

1. Choose efficient means of reducing supply vulnerability
  - stockpile
  - limit purchases
  - introduce technical fix
  - establish secure trade channels
2. ensure management cooperation with secure sources

Sector

Peacetime

1. coordinate sectoral policies to remove disincentive/market failure
2. subsidize key industries

National

Peacetime

1. pursue policies that remove disincentive/market failure
  2. counter foreign barriers to free trade
  3. practice free trade
-



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## LIST OF ACRONYMS

BDIC - Bolstering Defense Industrial Competitiveness  
DEFCON - Department of Defense/Defense Conditions  
DOD - Department of Defense  
EPRI - Electric Power Research Institute  
FEMA - Federal Emergency Management Agency  
GMR - Graduated Mobilization Response  
GRI - Gas Research Institute  
IPP - Industrial Preparedness Planning  
JIMPP - Joint Industrial Mobilization Planning Process  
MANTECH - Manufacturing Technology Program  
MILSPEC - Military Specifications  
OJCS - Organization of the Joint Chiefs of Staff  
ORNL - Oak Ridge National Laboratory  
OSD - Office of the Secretary of Defense  
PGM - Precision Guided Munitions  
R&D - Research and Development  
SEMATECH - Semiconductor Technology Research Institute  
USD/A - Undersecretary of Defense for Acquisition



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