Annual Industrial Capabilities Report

to

Congress

February 2005

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Executive Summary

Section 2504 of title 10, United States Code, requires that the Secretary of Defense submit an annual report to the Committee on Armed Services of the Senate and the Committee on Armed Services of the House of Representatives, by March 1st of each year. The report is to include:

> "(1) A description of the departmental guidance prepared pursuant to section 2506 of this title.
>
> (2) A description of the methods and analyses being undertaken by the Department of Defense alone or in cooperation with other Federal agencies, to identify and address concerns regarding technological and industrial capabilities of the national technology and industrial base.
>
> (3) A description of the assessments prepared pursuant to section 2505 of this title and other analyses used in developing the budget submission of the Department of Defense for the next fiscal year.
>
> (4) Identification of each program designed to sustain specific essential technological and industrial capabilities and processes of the national technology and industrial base."

This report contains the required information.

1. Introduction

Early in 2003, revolutionary requirements and acquisition processes began germinating in the Defense Department. The processes had a common objective: to develop and field 21st century American warfighting capabilities based on functional capabilities, not specific platforms or missions. Only with the consistent application of this functional capabilities context at all levels of planning and execution—from the warfighter to senior DoD decision-makers and industry—can the Department effectively draw from the industrial base the functional capabilities required to win 21st century conflicts.

1.1 The Capabilities-Based Defense Environment

This warfighting capabilities-based focus—when institutionalized in end-to-end processes—will better allocate DoD resources to joint, cross-service capabilities that must be delivered to the warfighter. Existing and new start programs must be assessed in the new context; and new processes are evolving within the Joint Staff and the Office of the Secretary of Defense to do just that. Operational concepts demonstrated in recent conflicts provide ample evidence of DoD's ability to shift to this capabilities-based paradigm. The warfighters who mounted GPS on horseback and whose ingenuity produced so many winning combinations—military and commercial, proven and untested—demonstrated the extent of the cultural change possible in 21st century warfare.

Nevertheless, significant challenges persist in combating the asymmetric threats of the global war on terrorism. For example, combat operations in Iraq have made clear that certain combat capabilities are required to deal with evolving threats during nation-building operations in an urban environment. In the case of body armor for soldiers, while deliveries may not have progressed as quickly as required, the technological solutions were in place and production capacity increased to meet the new demand. In the cases of improvised explosive devices and rocket propelled grenades, technological solutions that provide effective near-term active protective measures against those specific threats have not yet been developed or adapted. Absent a technological solution, industrial base sufficiency cannot yet be assessed—but will be once technological solutions emerge. Clearly in some cases, such as ballistic armor for tactical vehicles, the Department did not recognize the problem early enough to ensure adequate supply. In all cases—including those for which it developed non-materiel, tactical, or operational solutions to counter threats—the Department has worked hard to protect its warfighters.

Companies and allies also are reorganizing to reflect these functional concepts. This reorientation reflects the unique operational ethos of the U.S. defense industrial base that is the basis for effective industrial base planning. Warfighting capabilities and

the warfighter as the primary constituent, drive defense demand and the products military organizations acquire.

The Department is providing guidance to help industry establish stronger and more effective linkages to warfighters through the Defense Industrial Base Capabilities Study (DIBCS) series that explicitly map warfighting capabilities to the supporting industrial base. To date, the Department has published four of the reports: *Battlespace Awareness* in January 2004, *Command and Control* in June 2004, *Force Application* in October 2004, and *Protection* in December 2004[1]. It will publish the final report of the initial series—*Focused Logistics*—in May/June 2005. Armed with the detailed technology and industrial base context that these studies provide, companies should be able to craft more effective business and investment strategies focused on DoD's warfighting goals, better communicate those strategies to the Department and other suppliers, and become important enablers of a networked, functional capability approach to 21st century warfighting. Companies early to market in this functional context will have substantial competitive advantages.

The methodologies and processes developed in the DIBCS series also are taking root beyond the U.S. industrial base. The United Kingdom is exploring using the DIBCS concepts for its own industrial base assessments relating to future warfighting capabilities. Australia is considering using the DIBCS process in its own warfighting capabilities assessments to inform Australian industrial base considerations. Austrian defense officials have arrayed their defense companies into functional concept categories and are briefing those capabilities to the Department of Defense. Finally, Swedish defense officials and representatives of the emergent European Defence Agency have expressed interest in the DIBCS methodologies and processes.

The Department has relied on the imagination of industry to make real warfighting capabilities previously only dreamed of. Industry continues as an important ally in this new way of thinking. The functional capability construct substantially broadens the field of opportunities available to industry well beyond individual programs or an individual Military Service. At the same time, the clear statement of this vision to industry should boost the flow of ideas and innovation into the Department, creating a rich two-way dialogue between industry and warfighter in a consistent, functional capabilities-based language. In turn, this should broaden industrial base participation to solve the DoD's most difficult 21st century challenges.

It also is hoped that by translating warfighting concepts into an industrial and technology vernacular, the Department will inspire future generations of scientists and industrialists to focus on the technology challenges most important to U.S. national security. Identifying industrial issues requiring attention in the defense enterprise also will strengthen the defense industrial base—whether by bolstering science and technology funding for specific technologies, nurturing and "pulling" fledgling technologies critical for 21st century warfighting into specific defense programs, or

[1] The latter three reports are summarized in Chapter 4. The first report was summarized in the February 2004 *Annual Industrial Capabilities Report to Congress*.

blocking proposed corporate acquisitions that would result in insufficient innovative sources. The DIBCS series is identifying and characterizing thousands of warfighter capabilities, technologies, and companies within the structure of the Joint Staff's functional concepts in order to make the defense enterprise more transparent to prospective suppliers. They also provide real-time, actionable remedies to any insufficiencies identified. We owe the warfighter nothing less.

The DIBCS series is one of many efforts underway in the Department—and discussed in this report—to ensure that the industrial base is capable of meeting defense requirements now and into the future. Two ongoing efforts are particularly important to the global war on terrorism and merit special mention.

- The Department has used the powers of the Defense Priorities and Allocations System to require preferential performance on the nation's production lines. Examples include expediting delivery of multi-spectral targeting systems for Predator unmanned aerial vehicles by 18 months and providing secure satellite communication radios to United Kingdom (U.K.) forces operating in Afghanistan four months prior to their originally scheduled delivery. Where production capacity or conflicting service requirements are at issue, the Department's Priority Allocation of Industrial Resources (PAIR) Task Force has stepped in to prioritize and allocate deliveries to the most critical defense applications. It was the PAIR Task Force that allocated among the Services the ballistic backing material used in body armor such that all U.S. forces in Iraq had body armor by January 2004. The PAIR Task Force continues to manage the allocation of body armor material and also armor plate for tactical vehicles.

- The Department has instituted a process to protect critical defense industrial infrastructure in agreements being crafted between these facilities and the Defense Contract Management Agency under the overall direction of the Assistant Secretary of Defense (Homeland Defense).

1.2 The Defense Industrial Environment

The Department does not concur with concerns raised by some that the U.S. defense industrial base is in crisis.

Consolidation

For the most part, the defense industrial base is not overly consolidated and the level of competition is sufficient to avoid stifling innovation and hurting the warfighter. Ongoing Department industrial assessments of functional capabilities required to support 21st century warfighting have identified over 1,773 distinct warfighting capabilities enabling the functional concepts where it believed the U.S. military must

maintain at least a one-generation lead over potential adversaries; and 255 priority critical technologies and components supporting those warfighting capabilities. For these most important technologies, we have identified over 800 companies with relevant industrial base capabilities.

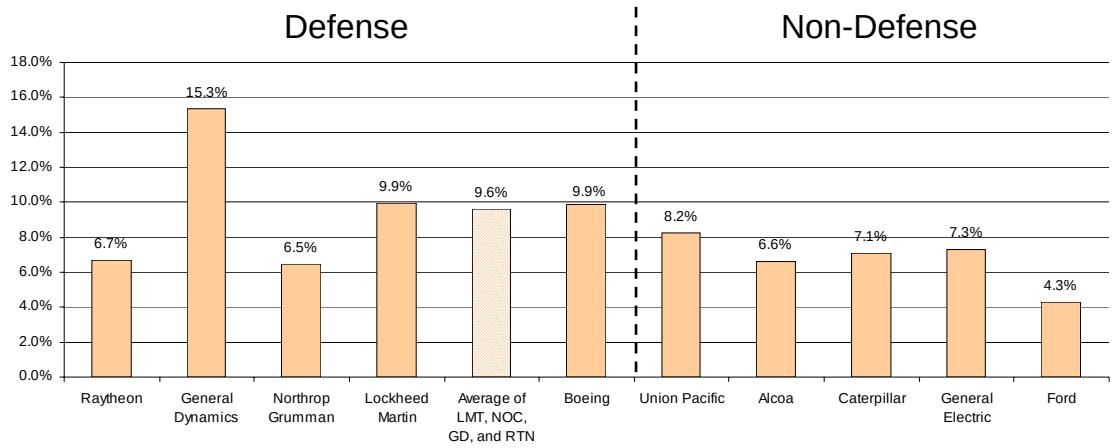
That said, there could be shortfalls in providing desired capabilities to warfighters which arise when actual operational requirements dictate production quantities significantly greater than those required for peacetime acquisitions—or for originally-projected operational requirements. For example, precision-guided munitions (PGMs) have become the weapons of choice in recent conflicts. While DoD policy generally is to fight with the weapons on hand, recent history indicates that accelerated production of certain PGMs may be required to successfully prosecute future conflicts. The Department experienced PGM shortages during operations in Kosovo, Afghanistan, and Iraq, and mobilized industry to significantly accelerate Laser-Guided Bomb and Joint Direct Attack Munitions production during the global war on terrorism. As a result of that experience, the Department now is monitoring the replenishment of expanded inventories and the adequacy of current production rates. ODUSD (Industrial Policy) is also studying the supplier base supporting PGMs in an effort to identify and address supplier bottlenecks.

Economic Outlook

The overall economic outlook for the U.S. aerospace/defense industry is positive. Aerospace sales in 2004 totaled $161 billion dollars, an increase of 8 percent over 2003's $149 billion dollars according to Aerospace Industries Association (AIA). Net profitability also improved slightly over 2003's 4.1 percent to 4.2 percent. AIA estimates that aerospace sales in 2005 will hit $173 billion dollars, a 7.5 percent increase over projected 2004 sales of $161 billion dollars. It also expects profitability to increase, projecting 2005 net profit margin of 5.5 percent, a 24 percent increase over 2004.

In addition, aerospace/defense operating profit growth has outpaced the S&P 500 in 5 of the last 8 years; and the earnings outlook for 2005 and beyond is for strong double-digit growth. In fact, when measured by return on invested capital—arguably the purer measure—the chart below demonstrates investment in a major aerospace company beats investments in comparable non-defense industrials.

3-YEAR AVERAGE RETURN ON INVESTED CAPITAL, CROSS-INDUSTRIAL COMPARISON (2001-2003)



Sources: Company Filings, Standard & Poor's, and FactSet

This is because aerospace/defense firms benefit from lower capital requirements driven by: (1) the Government being a good bill payer (which reduces working capital); (2) progress payments (which reduce inventory levels); and (3) shared use of facilities (which reduces capital investments). Venture capitalists have a growing appetite for defense investments, and numerous boutique investment firms have sprouted around the DC beltway to service this interest. Finally, defense assets are plenty attractive to the merger and acquisition communities. As measured by our antitrust and foreign investment reviews, $33.4 billion in defense-related assets changed hands in 2004.

Industry Globalization

Concerns that the Department is acquiring military materiel overseas to the detriment of national security and the U.S. defense industrial base also appear misplaced. Certainly the Department is committed to acquiring the best for the warfighter—not just the best from the *American* industrial base or the *defense* industrial base. That said, two Department studies completed in 2004 indicate that the Department employs foreign contractors judiciously and in a manner consistent with national security.

The January 2004, DoD report *Study on Impact of Foreign Sourcing of Systems*[2] concluded that foreign suppliers provide limited amounts of materiel for the systems, and that using those foreign subcontractors does not impact the long-term readiness or the economic viability of the national technology and industrial base. For the systems studied, foreign subcontracts collectively represented about 4 percent of the total contract value and less than 10 percent of the value of all subcontracts.

[2] Summarized in the February 2004 *Annual Industrial Capabilities Report to Congress*.

The November 2004 report *Foreign Sources of Supply: Assessment of the United States Defense Industrial Base*[3] concluded that the Department procures very few defense articles and components from foreign suppliers. In Fiscal Year 2003, the Department awarded contracts to foreign suppliers for defense articles and components totaling just over $1 billion, less than one-half of one percent of all DoD contracts; and only about 1.5 percent of all DoD contracts for defense articles and components.

In fact, to improve their ability to access the U.S. defense (and to some extent, non-defense) market, non-U.S. firms increasingly are investing in the United States. Overall foreign direct investment[4] in the United States declined by 12 percent from the 1996-1999 to the 2000-2003 period. However, foreign direct investment in the U.S. defense and aerospace sector dramatically increased, nearly tripling over the same period. Such investments "import" innovation and competition, increase U.S. employment, create higher paying U.S. jobs, and increase U.S. tax revenues.

FOREIGN DIRECT INVESTMENT IN THE U.S.—CUMULATIVE FLOW
(MILLIONS OF CURRENT DOLLARS)

Foreign Direct Investment in the United States -- Annual Flow			
	1992-1995	**1996-1999**	**2000-2003**
Overall			
Volume	$173,752	$645,663	$566,110
% Change		272%	-12%
Aerospace			
Volume	$894	$1,158	$3,448
% Change		30%	198%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Aerospace data drawn from NAICS 3364 (Aerospace Product & Part Manufacturing, which includes aircraft, engine, missile, and space systems and parts and auxiliary equipment manufacturing).

1.3 Assessing and Ensuring Industrial Base Sufficiency

U.S. defense systems lead the world and the U.S. industry that develops and builds them continues to be the most technologically innovative, capable, and responsive in the world. The Department expects that U.S. industry leadership to continue into the foreseeable future. The four DIBCS reports published in 2004 identified a total of 1,773 warfighting capabilities where the U.S. military should maintain at least a one-generation lead over potential adversaries and 255 priority critical technologies and components supporting those warfighting capabilities. Industrial

[3] Summarized in Chapter 4.
[4] Foreign direct investment includes equity capital, inter-company debt, and reinvested earnings.

Policy identified only 19 (7.5 percent) of these most important technologies where there was a potential U.S. industrial base insufficiency.

The industrial base supporting defense generally is sufficient to meet current and projected DoD needs. Nevertheless, there are and will always be, problem areas that the Department must address. This report, and its predecessors, describes the kinds of assessments the Department employs to identify industrial sufficiency problems and the actions that the Department can and does take to address those problems.

Finally, the Department understands that the industry supporting defense is reshaping itself to respond to significant changes in military missions. Major defense firms are responding by reducing excess capacity, streamlining processes, and revamping supplier relationships. These changes may have negative impacts on certain suppliers within the United States. Recognizing the potential long-term negative consequences of firms exiting the defense business, the Department has developed policies, processes, and structured procedures necessary to make appropriate judgments about identified industrial issues and to integrate those judgments into its regular budget, acquisition, and logistics processes.[5] DoD Directive 5000.60, "Defense Industrial Capabilities Assessments," and the accompanying Handbook 5000.60-H, "Assessing Defense Industrial Capabilities," established the policies, procedures, and circumstances under which the Department will take action to preserve endangered industrial capabilities. Basically, before taking action, the Department must verify the warfighting utility of the industrial capability, that the industrial capability is unique and at risk, that there are no acceptable alternatives, and that the proposed action is the most cost- and mission-effective.[6]

1.4 Conclusion

The Department of Defense is a relatively small player in the overall U.S. economy (about 3.75 percent of the gross domestic product) and Department leverage within the overall U.S. manufacturing sector is limited. Many U.S. industries once dominated by DoD demand now are focused on, and dependent on, commercial markets. Examples include global commercial markets like information technology and integrated circuits where U.S. defense applications represent about 1 percent and 1-2 percent of the global market, respectively; and steel where direct DoD sales represent 0.4 percent of the U.S. market and 6.3 percent of the U.S. market when also including indirect DoD sales (commercial product purchases). While the Department must deftly leverage its relatively modest equities in such markets, its actual influence is slight. Attempts to replicate commercial products in defense-dependent facilities would drain DoD focus and resources from other defense needs and remove the competitive

[5] In 1996; as summarized originally in the February 1997 *Annual Industrial Capabilities Report to Congress*.

[6] The Department's Defense Trusted Integrated Circuit Strategy summarized in the February 2004 *Annual Industrial Capabilities Report to Congress* and updated in Chapter 4 of this report is a case in point.

pressure of the commercial marketplace that drives innovation. Nevertheless, it is desirable—and absolutely necessary—that the Department take whatever steps are necessary to ensure the industrial base on which it depends remains sufficiently reliable, innovative, and cost-effective to meet the nation's national defense requirements. The Department is doing so and will continue to do so.

2. New DoD Policy

The Department's move towards capabilities-based planning will fundamentally change the defense enterprise. It already is changing the manner in which the Department identifies and prioritizes military capability requirements, focusing its attention on enabling capabilities—often acquired in families-of-systems or systems-of-systems. Inherent in this shift are changes in doctrine and the way the Department manages the development and acquisition of these capabilities. How the Department looks at what it has and what it needs will also affect who participates in the defense industrial base—and challenge the Department to make better use of a broader base of suppliers.

As the strategic environment, operational requirements, and the industrial base change, the Department is developing new strategies to leverage technology and industrial base innovation in order to deliver critical capabilities to the warfighter. These integrated, capabilities-based approaches will drive acquisition decision-making, force changes in the Department's corporate processes, and challenge program managers and the Department to plan for innovation and to inject it more rapidly.

Selection of Contractors for Subsystems and Components (July 2004)

The Defense Acquisition System is built on the premise that the Department benefits from innovation, flexibility, reduced life cycle costs, and increased quality when major defense acquisition programs provide for competition at the prime contractor and subcontractor levels. Meeting this objective requires that prime contractors foster a robust competitive environment for the selection of major and critical products and technologies as major systems are designed and developed.

To ensure prime contractors do not shut out innovative subcontractors in favor of doing the work in-house, the Acting USD(AT&L) issued policy clarification on July 12, 2004, reiterating that program managers and contracting officers should retain both insight into the subcontractor selection process and an ability to influence that selection. For example, when establishing the contract fee structure, program managers and contracting officers are encouraged to give more value to the contractor's effective use of competition throughout the life of the program. In fact, the program manager may require that certain subcontracts be let only after explicit DoD approval, if there is determined to be a potential for bias in subcontractor selection and the potential bias cannot be adequately mitigated.

Defense Acquisition Guidebook (September 2004)

In fall 2004, the Department posted its new Defense Acquisition Guidebook to the Defense Acquisition University website. Section 2.3.16 of the Guidebook ("Business Considerations") notes that "competition is the key to fostering innovation for defense applications" and requires that the program acquisition strategy describe the competition planned for all phases of the program's life cycle. The Guidebook also notes that "to promote synergies that facilitate competition and innovation, the [program manager] should, where feasible identify other applications for the technologies in development within the functional capability areas identified by the Joint Staff."

The Guidebook provides specific advice to DoD program managers and other DoD acquisition professionals on how to foster a competitive environment by:

- ensuring future competition for defense products,
- building competition into individual acquisition strategies,
- applying competition to acquisition phases, and
- encouraging early industry involvement.

Defense Logistics Agency

The Defense Logistics Agency's (DLA) industrial capability guidance is being revised to accommodate lessons learned from Operations Enduring Freedom and Iraqi Freedom (OEF/OIF). Analyses of military service requisition data revealed that a large percentage of wartime demands were not planned surge and sustainment (S&S) items based upon the Services' War Reserve requirements. While the planned requirements were effectively covered during OEF/OIF, there remains a potential vulnerability in the Agency's ability to support unplanned requirements. Analysts also determined a majority of these unplanned items were weapon system coded (identified to specific weapon systems). Based upon this analysis, DLA is changing its S&S guidance is to include these unplanned weapon system coded items in the S&S requirements table.

Additionally, procurement policy is being revised to improve the Agency's ability to transition from peacetime operations to the increased demands of wartime and contingency support. The new policy moves away from mandatory S&S clauses that often confused small businesses and provides options for obtaining S&S coverage through production lead time reductions, maximum delivery quantities and schedule, and leveraging DLA peacetime inventories. The Agency is revising contract clauses for S&S and they still will be used as necessary for those items where shortfalls may exist after exercising the other options mentioned above. The changes simplify the S&S planning process, maximize use of industry capabilities before making industry investments, and ultimately facilitate improved S&S coverage. The new S&S guidance has been drafted and is in the formal coordination process.

3. Defense Mergers and Acquisitions

3.1 Introduction

Robust, credible competition is vital to providing the Department with high quality, affordable, and innovative products. The Department has no blanket policy of discouraging further consolidation or divestiture, or encouraging a specific industry structure. The Department believes that the competitive pressure of the marketplace is the best vehicle to shape an industrial environment that supports the defense strategy. Therefore, the Department of Defense takes action to intervene in the marketplace only when necessary to maintain appropriate competition and develop and/or preserve industrial and technological capabilities essential to defense that the marketplace, left unattended, would not. The Department evaluates each proposed transaction on its particular merits in the context of the individual market and the changing dynamics of that market.

The Department must establish, maintain, and strengthen industrial relationships that ensure that the future defense industrial base is both healthy and vital. In doing so, the Department maintains focus on the need to encourage competitive forces for innovation while acknowledging the need of companies to scale up or combine with other firms to create new industrial capabilities essential for future warfare. Such flexibility is essential if the Department is to capitalize on the revolutionary technologies of tomorrow.

DoD reviews several kinds of business combinations involving defense suppliers: (1) proposed mergers or acquisitions filed under the Hart-Scott-Rodino Antitrust Improvement Act of 1976 (currently, transactions valued at more than $50 million); (2) other collaborations among competitors that have been made public (joint ventures, mergers and acquisitions) of special interest to the Department that do not meet the Hart-Scott-Rodino Act filing threshold; and (3) proposed acquisitions of U.S. defense contractors by non-U.S. firms for which filings have been made pursuant to section 721 of the Defense Production Act (also known as the Exon-Florio Amendment).

DoD antitrust and foreign investment in the United States reviews have a common basis relative to assessing impacts on the industrial base and potential remedies. The Defense Industrial Base Capabilities Study (DIBCS) series identify “be ahead” and “be way ahead” warfighting capabilities, the critical technologies that enable those warfighting capabilities, and selected companies that provide those technologies. The Department is using the DIBCS series as an aid in developing the Department’s position for regulatory reviews. First, DoD merger and acquisition reviews now utilize the DIBCS series results to identifies transactions that may involve identified critical technologies. Second, the Department now is including in its consideration of the impact of a potential merger, the future technologies – using the DIBCS information – that will provide the capabilities that are subject of the merger.

The Department also has become increasingly sensitive to the innovative capabilities within the industrial base supporting defense and is concerned that transactions not undermine innovation and value to the Department. The Department therefore will use its existing authority to protect/promote innovation and additionally may seek regulatory support from outside the Department to protect innovation.

3.2 Merger and Acquisition Reviews

The Federal Trade Commission and the Department of Justice (the "antitrust agencies") have the statutory responsibility for determining the likely effects of a defense industry merger on the performance and dynamics of a particular market; and whether a proposed merger should be challenged on the grounds that it may violate antitrust laws. As the primary customer impacted by defense business combinations, DoD's views are particularly significant because of its special insight into a proposed merger's impact on innovation, competition, national security, and the defense industrial base. Accordingly, the Department actively works with the antitrust agencies.

DoD reviews are structured to identify impacts on national security and on defense industrial capabilities; evaluate the potential for loss of competition for current and future DoD programs, contracts and subcontracts, and for future technologies of interest to the Department; and address any other factors resulting from the proposed combination that may adversely affect the satisfactory completion of current or future DoD programs or operations.

In 2004, the Department reviewed 32 transactions, as shown in the following table, pursuant to the Hart-Scott-Rodino provisions of the Antitrust Improvement Act. Of those cleared by the antitrust agencies, one required a consent order to protect continued competition. Several cases involved mitigation of organizational conflicts of interest, and were subsequently cleared.

DEFENSE MERGER AND ACQUISITION REVIEWS - 2004

Acquirer	Acquired Company	Value ($M)*	Disposition
Alliant Techsystems	PSI Group	$165	No Objection
Alliant Techsystems	Mission Research Corp.	$215	No Objection
BAE Systems plc	DigitalNet Holdings	$600	No Objection
BAE Systems plc	Alphatech	$88	No Objection
Boeing	Frontier Systems	N/A	No Objection
CACI	American Management Systems (Defense & Intel.)	$415	No Objection
Carlyle	General Electric Garrett Aviation Service	$160	No Objection

DEFENSE MERGER AND ACQUISITION REVIEWS – 2004 (CONTINUED)			
Acquirer	**Acquired Company**	**Value ($M)***	**Disposition**
Carlyle	Dunlop Standard Aerospace's Engine Repair and Overhaul Division	$760	No Objection
Cray	OctigaBay Systems Corp.	$115	No Objection
Curtiss-Wright	Dy 4 Systems	$110	No Objection
Cypress	Communications & Power Industries	$300	No Objection
EADS	Racal Instruments Group	$105	No Objection
Finmeccanica	Agusta Westland	$1,938	No Objection
General Dynamics	Spectrum Astro	N/A	No Objection
General Dynamics	Alvis	$721	N/A
General Dynamics	TriPoint	N/A	No Objection
General Electric	Invision	$900	Consent Decree Divestiture
Honeywell	Hymatic Group Ltd.	N/A	No Objection
ITT Industries	Eastman Kodak's Remote Sensing Systems (RSS) Business	$725	No Objection
L-3 Communications	Boeing EDD	N/A	In Process
L-3 Communications	General Dynamics Propulsion	$185	In Process
L-3 Communications	CAE Marine Control Division	$268	No Objection
L-3 Communications	Cincinnati Electronics	$172	No Objection
L-3 Communications	Northrop Grumman Canada	$65	No Objection
L-3 Communications	Brashear, L.P.	$36	No Objection
Lockheed Martin	Sippican	N/A	No Objection
Meggitt	Dunlop Aerospace Design and Manufacturing Division	$747	No Objection
QinetiQ	Foster Miller	$163	No Antitrust Objection
Raytheon	Photon Research Associates	N/A	No Objection
Smiths Group	Integrated Aerospace	$110	No Objection
Valero	Kaneb	$2,800	In Process
Zeus	Intelsat	$5,000	No Objection

Notes: * Value based on publicly available information. N/A indicates transaction value is not publicly available.
Source: ODUSD (IP)

3.3 Foreign Investment in the United States

The Exon-Florio Amendment to the Omnibus Trade and Competitiveness Act of 1988 established Section 721 in the Defense Production Act. This section authorizes the President to suspend or block foreign acquisitions, mergers, or takeovers of U.S.-located firms when they pose credible threats to national security that cannot be resolved through other provisions of law.[7] The President has delegated management of the Exon-Florio Amendment to the interagency Committee on Foreign Investment in the United States (CFIUS), chaired by the Department of the Treasury.

Under Exon-Florio, the President has 30 days from the time he is notified of a foreign acquisition to initiate an investigation of the transaction. During the first 30 days after formal notification CFIUS members conduct a preliminary review to determine whether the transaction poses credible threats to national security and, if so, whether there are means to adequately mitigate those threats under various statutes or departmental regulations. By the 30th day, the CFIUS must either approve the transaction, with or without risk mitigation measures, or initiate an investigation. There are no other options under the law. If the CFIUS begins an investigation, it must complete a report on the investigation within 45 days. The President then has 15 additional days to decide what action to take. The DoD makes determinations on whether the U.S. firm being acquired is engaged in the development of defense critical technology or is otherwise important to the defense industrial and technology base. The President must inform Congress of his decision in each case involving an investigation.

The Department of Defense is a member of the Interagency Committee. As a CFIUS member, the Department evaluates the national security aspects of proposed foreign acquisitions of U.S. defense contractors and other U.S. firms indirectly impacting national defense. In assessing foreign acquisitions, the Department's principal objectives are to facilitate the development of an integrated defense industrial base among U.S. allies and trading partners in order to increase interoperability in coalition warfare and reduce DoD acquisition costs; and, simultaneously to: (1) protect the reliability of supply of goods and services to the Department; (2) minimize the risks of unauthorized transfer of classified information and military and dual use technologies; and (3) assure there is congruence of strategic interests between the acquiring firm and the DoD.

To assist in achieving the latter objective, the Department determines in each case whether the firm being acquired possesses critical defense technology or is otherwise important to the defense industrial and technology base based on the outputs of the Defense Industrial Base Capability Study (DIBCS) and other technology assessments that underlie DoD recommendations regarding export-licensing regulations. The intelligence community also prepares for the Department a risk

[7] Excepting the International Emergency Economic Powers Act.

assessment of the acquiring firm and country which evaluates (1) their compliance with U.S. and international export control laws and other international regimes which regulate proliferation of weapons of mass destruction; (2) their potential reliability as suppliers to the defense industrial base; and (3) their support in fighting international terrorism.

Given the statutory confidentiality provisions in section 721 of the Defense Production Act, the Department cannot publicly discuss specific reviews. Information submitted to the CFIUS is protected by law from disclosure to ensure that voluntarily submitted sensitive business information is not compromised.

During 2004, a review of the 53 CFIUS cases filed indicates that: 15 percent of the transactions involved U.S. firms deemed to possess critical technologies; 17 percent of the U.S. firms were determined to be otherwise important to the defense industrial base; and about 6 percent of these cases met both criteria. In most cases, the Department, acting under its own industrial security regulations or other means, remedied its concerns by imposing measures on the acquiring firms to reduce risks of foreign ownership, control and influence on national security. In two cases a 45-day Investigation was conducted to supplement the initial 30-day review. The total dollar value of all 2004 CFIUS transactions was roughly $27 billion.

4. Industrial and Technological Capabilities Assessments

Methods and Analyses

The Department periodically conducts analyses/assessments to identify and evaluate those industrial and technological capabilities needed to meet current and future defense requirements. It then uses the results of these analyses/assessments to make informed budget, acquisition, and logistics decisions.

"DoD-wide" industrial assessments evaluate and address changes in key system, subsystem, component, and/or material providers that supply many programs, and affect competition, innovation, and product availability. DoD Components conduct their own assessments when: (1) there is an indication that industrial or technological capabilities associated with an industrial sector, subsector, or commodity important to a single DoD Component could be lost; or (2) it is necessary to provide industrial capabilities information to help make specific programmatic decisions. These assessments generally are conducted, reviewed, and acted upon internally within the DoD Components. Additionally, the Defense Contract Management Agency supports DoD-wide and DoD Component industrial assessments by utilizing its broad knowledge across industrial sectors and its on-site presence in many contractor industrial facilities.

4.1 DoD-Wide

Beryllium Metal Industrial Base (May 2004)

In section 824 of the National Defense Authorization Act for Fiscal Year 2004, the Congress directed the Secretary of Defense to conduct a study of the adequacy of the U.S. defense industrial base to meet defense requirements of the United States for beryllium. The Secretary was directed to submit to Congress by March 31, 2005, a report on the results of the study including discussion of issues relating to beryllium supply, the need for modernization of the primary sources of beryllium, and the advisability of meeting future defense requirements and maintaining a stable domestic industrial base of beryllium through public-private partnerships, administration of the National Defense Stockpile (NDS) and any other means the Secretary found suitable.

The USD(AT&L) transmitted the completed Study and Report to the Congress on May 20,2004, ten months prior to the due date. The Report noted that the U.S. lost its only capacity to manufacture primary beryllium metal in 2000 when the only producer, Brush Wellman, Inc. (BWI) mothballed its production facility for economic and health and safety reasons. Since then, BWI has relied on a dwindling supply of beryllium ingot from the NDS which it purchased to meet defense and other needs for high purity beryllium metal products. Once the ingot is exhausted, the NDS also has uncommitted beryllium inventories of hot-pressed powder billet that are being held in reserve and

could only extend the depletion date for a few years if they were made available to the private sector. The depletion of the NDS inventories is important because beryllium is a strategic and critical material that, because of its unique combination of mechanical and nuclear properties including light weight combined with extraordinary stiffness and strength, is employed in a wide range of critical defense systems ranging from sensors, aircraft, and missiles to satellites and nuclear warheads.

The Report estimated that the depletion date for NDS beryllium ingot inventories, based on an assumed annual growth rate in demand of six percent over at least the next five years, could be extended from a projected date of 2008 until 2011 if anticipated imports of beryllium from Kazakhstan have quality levels sufficient for lower purity applications such as the metal matrix composite AlBeMet. The Report also noted that it would take a minimum of three to five years to design, permit, construct, equip, and test a new primary beryllium facility regardless of whether current or a newer manufacturing technology were employed.

The Report concluded that even if purity levels of beryllium imports from Kazakhstan were to reach acceptable levels for high purity applications in a few years, the risks of a sole source dependence on that country for production and Russia for feedstock were too great for a material required to meet DoD transformational and strategic warfare objectives. Moreover, if the DoD were to authorize BWI to transfer its beryllium manufacturing technology to Kazakhstan to improve the quality of imports, there would be additional risks. The U.S. would have no control over sales of very high purity beryllium metal to third countries that produce or seek to produce nuclear weapons or defense-related products essential to transformational warfare.

Since current imports are not a viable long-term option due to purity limitations and commercial investment alone is highly unlikely, the Report recommended that the DoD begin a multi-year cost share program with private industry, possibly through Title III of the Defense Production Act, to support design, construction, and equipping of a new primary beryllium metal production facility. The Report recommended DoD funding of $30 to $45 million (i.e., $6-9 million/year). In addition, the Report stated that the NDS' final reserves of beryllium, in the form of hot-pressed powder billet, should only be released as a last resort, serving as a hedge against delays in bringing the new facility on line.

To implement the recommendations of the Report, the USD(AT&L) has allocated $6 million from FY06 funds to initiate a Defense Production Act Title III project to provide a domestic production facility for high purity beryllium metal. Funding for four subsequent years will be addressed in the FY07 POM.

DoD Fuze IPT Industrial Capabilities Assessment (May 2004)

The Defense Contract Management Agency (DCMA) Industrial Analysis Center conducted this study for the Office of the Under Secretary of Defense (Acquisition, Technology and Logistics). DCMA conducted a comprehensive industrial capability assessment to examine current and future capabilities of the fuze industrial base. The assessment examined the capabilities, capacities, and financial viability of key fuze manufacturers to determine their ability to support future DoD requirements. The assessment concluded that, although it is dependent on defense demand, the fuze industry has the capacity and capability to meet near-term DoD requirements. Many of the contractors are single/sole sources for specific fuzes, but they also possess sufficient capabilities and excess capacity to design and manufacture fuzes other than their current portfolio of products. Due to this excess capacity (and slim corporate profit margins), the assessment noted that further industry consolidation might occur through 2008. Research and development funding has diminished.

The study recommended that the Department of Defense consider:

- identifying fuze contractors with unique capabilities for the Critical Infrastructure Protection program,
- continuing to work to award multi-year, multi-source awards,
- streamlining the approval process for domestic fuze manufacturers to increase foreign military sales,
- increasing research and development (science and technology) funding for both government and industry, and
- establishing guidelines to ensure viability of required industrial capabilities.

The Department is still considering these recommendations.

Defense Industrial Base Capabilities Study: Command and Control (June 2004)

In February 2003, the Deputy Under Secretary of Defense for Industrial Policy published *Transforming the Defense Industrial Base: A Roadmap*.[8] That report identified the need for systematic evaluation of the ability of the defense industrial base to develop and provide functional, operational effects-based warfighting capabilities. The Defense Industrial Base Capabilities Study (DIBCS) series began a systematic assessment of critical technologies and industrial capabilities needed in the 21st century defense industrial base to meet warfighter requirements as framed by the Joint Staff's Functional Concepts and Joint Operational Architecture. The DIBCS series ties directly to warfighter needs by linking industrial base capabilities to warfighter capabilities derived from the Joint Staff's Functional Concepts.

[8] Report available on the Internet (http://www.acq.osd.mil/ip).

The overall objectives of the DIBCS series are to: (1) identify technologies critical to the new Joint Staff functional warfighter capabilities, and to establish a reference database of these key critical industrial base capabilities mapped to warfighting functional capabilities; (2) conduct industrial base capability assessments on priority critical technologies to identify deficiencies; and (3) develop a systematic method to craft industrial base strategies to remedy identified industrial base deficiencies and encourage proactive, innovative management of the industrial base.

The DIBCS series began with *DIBCS: Battlespace Awareness (BA)*,[9] the first in a series of five, published in January 2004. A summary of *DIBSC BA* can be found in The Annual Industrial Capabilities Report to Congress, February 2004. *DIBCS: Command and Control* addresses the second of the functional concepts and was published in June 2004.

It identified 189 warfighting capabilities directly enabling U.S. warfighting leadership in this area. Of this total, 293 technologies qualified as ones where the United States should be ahead of any potential adversary. An assessment for industrial base sufficiency of the 58 more pressing applications of the 293 technologies found that, with few exceptions, available industrial base capabilities are sufficiently innovative and robust.

The report made the following two recommendations:

- The Department should consider implementing the remedies in the report for these specific industrial capability areas:
  - Helmet Mounted Displays for improving warfighter situational awareness;
  - Swarming Control Tools to provide decentralized control and distributed intelligence of an array of unmanned vehicles;
  - Optical (Laser) Intersatellite Links for improving the rate and quality of information transfer between satellites.

- Within the Department, the Office of the Deputy Under Secretary of Defense (Industrial Policy) (ODUSD (IP)) should continue to be the clearinghouse for industrial base deficiencies. ODUSD (IP) will continue to assess Command and Control industrial base sufficiency using the capabilities framework, databases, and policy tools developed in the study.

Once all five reports within the DIBCS series are issued, the Department will consolidate and review the recommendations; and develop an implementation strategy.

[9] Report available on the Internet (http://www.acq.osd.mil/ip).

The Vertical Lift Industrial Base: Outlook 2004-2014 (July 2004)

In July 2004, the Deputy Under Secretary of Defense for Industrial Policy published *The Vertical Lift Industrial Base: Outlook 2004-2014.*[10] The report concluded that the vertical lift industrial base still is being shaped by government and industry responses to the Nunn-McCurdy cost breaches of 2001 and the unintended consequences of Department-endorsed teaming arrangements that resulted in an interlocked industrial base that restricted Department and industry flexibility. The Department's budget-driven remanufacture strategy in the 1990s produced a series of sole-sourced relationships, leaving few real competitive opportunities among the helicopter prime contractors to force technology refresh cycles. With limited competition, few new platform contracts, and declining government technology investments, industry was left little incentive to invest in independent research.

The report concluded that over the next several years, this industry will be shaped by the operational experiences and associated refurbishment requirements for helicopters resulting from the Global War on Terrorism. It also will be shaped by changes in warfighting concepts inspired by the new Joint Staff functional capability concepts, as well as by vertical lift requirements associated with major new Marine Corps, Air Force, and system-of-systems programs. This critical watershed affords both the Department and industry a unique opportunity to plan cogently for future vertical lift demand and associated industrial requirements. The report highlights evolving vertical lift requirements and key DoD challenges in order to better shape the future of this industrial base.

The report recommended the following measures to ensure innovation of the vertical lift industrial base as we move to the systems-of-systems that undergird the functional concepts of 21st century warfare:

- Fund the development of concepts that exceed current capabilities. For example, the Department should consider redoubling its focus and interest in heavy lift as a possible family of capabilities provided for FCS and Sea Basing, drawing on as wide an array of suppliers as possible and structured in a series of competitive awards. A joint program office may serve these Department objectives well.

- Leverage near-term program and maintenance support decisions to enhance innovation in this industrial base by promoting innovation at every opportunity. This involves not repeating the paradigm of sole sourcing follow-on and support contracts to legacy suppliers, as well as resisting the temptation to procure existing platforms where innovative approaches available in the industrial base could yield enhanced capability—potentially at less cost. Additionally, industrial base impacts should be a consideration in the development of acquisition strategies.

[10] Report available on the Internet (http://www.acq.osd.mil/ip).

- Sustain the U.S. lead in tilt-rotor technology, which may in turn reinforce and cross-feed heavy lift concepts. Tilt-rotor is a truly revolutionary technology with the potential to change the future of this sector in manned and unmanned applications.

- Use innovative proposal evaluation criteria to shape the industrial base.
  - The Department continues to recognize the importance of visible, demonstrated, and continuous improvement in process capabilities, system capabilities, and product and supply chain management.
  - Ambitious readiness standards should also be made part of all follow-on, support, and new aircraft acquisition strategies. Warfighters dependent on vertical lift should not be forced to work around readiness standards a fraction of those typical in the fixed-wing community.
  - System-of-systems, functional capabilities and corresponding interfaces/ synergies should be emphasized at every opportunity.

Finally, the report concluded that the vertical lift industry must move from an emphasis on individual platforms to focus on system-of-systems concepts, consistent with the Joint Staff's functional capability concepts. The report is intended to inform decision-makers within the Department and the vertical lift aircraft industry to better align decisions and program structures with 21st century capability requirements of the U.S. warfighter.

Funds made available due to the cancellation of the Comanche program have provided the Department the opportunity to return to a competitive acquisition process. Examples are the Army's Armed Reconnaissance Helicopter (ARH) and Light Utility Helicopter (LUH) competitions that are being put into place. In addition, the Navy also sponsored competition for the acquisition of the Presidential Helicopter (VXX). The Air Force's Personnel Recovery Vehicle (PRV) will provide another opportunity in the near future to stimulate competition. These programs will help stimulate innovation within the U.S. industrial base and also strengthen their global competitive positions.

Due to operational demands, not all helicopter programs can be competed. For example, the Department still has a number of remanufacturing programs, such as the UH-1, AH-1, and CH-53 for the Marine Corps and CH-47, UH-60, and AH-64D for the Army. However, the Department has modified the UH-1, CH-53, and CH-47 programs from being remanufacture programs to "new build of existing design" programs because: (1) combat losses have reduced the number of UH-1 and CH-47 aircraft available for remanufacturing; and (2) the cost to remanufacture the UH-1, CH-47 and the CH-53 airframes have risen to a level equal to building a new airframe. Building new airframes removes many of the "unknown variables" which have plagued remanufacturing efforts and caused unforeseeable cost growth, it also allows deployed forces to continue using legacy assets longer.

Finally, the Department continues to work closely with industry to institutionalize Earned Value Management and Lean manufacturing across this sector. There is no guarantee that the acquisition of complex weapon systems will not run into technical challenges or that changing requirements will not result in the need to change the programs and their associated costs. However, the Department is taking advantage of competition wherever possible in order to re-establish a more vibrant, responsive, and innovative industrial base.

Defense Industrial Base Capabilities Study: Force Application (October 2004)

DIBCS: Force Application (FA) [11] is third in a series of five studies addressing the functional concepts framed by the Joint Staff's Functional Concepts and Joint Operational Architecture. *DIBCS FA* identified 1,036 specific warfighting capabilities supporting FA. Of these, 787 capabilities were ones in which the United States should maintain a lead of at least one technology generation. Translation of these latter capabilities yielded 212 associated critical enabling technologies. The study team assessed 32 of the most important of these technologies and 29 associated component technologies—for a total of 61 technologies assessed for industrial base sufficiency. While in general, U.S. defense suppliers hold a technological advantage over foreign competitors for FA technology, a larger number of leadership or sufficiency of supply issues were found in FA than in the previous studies: six in FA versus three each in BA and C2. The study team surmises that this is because most nations seeking military capabilities focus on FA capabilities, thereby creating a more competitive field globally.

ODUSD (Industrial Policy) recommended that the Department consider implementing remedies to address two categories of issues.

- The study team identified technologies that are not likely to be part of the U.S. warfighting arsenal. They are important because they represent unusual technical solutions and could pose challenges to U.S. warfighters if proliferated elsewhere. The team created a "Watch List" to document these technologies for further consideration and policy remedies:
  - Million-Rounds-Per-Minute Gun ("Metal Storm");
  - Electro-Hydraulic Cavitation Device.

- The study team also identified six industrial capabilities needing additional attention to obtain or sustain the desired degree of U.S. capability leadership or supplier sufficiency:
  - Pulsed Plasma Thruster;
  - Hypersonic Weapon Propulsion System;
  - Small Caliber Projectile Control Surfaces;
  - GPS-Guided Small Diameter Bomb (SBD);
  - Chemical Oxygen-Iodine Laser (COIL);

[11] Report available on the Internet (http://www.acq.osd.mil/ip).

- Self-Propagating High-Temperature Synthesis Device.

The study also recommended that the Department reinforce acquisition policies that empower program managers to flexibly and effectively manage programs within functional capability constructs. Based on work to date, and the objective to continue to infuse programs with innovation and technological advances, current acquisition policies appear to provide program managers this essential flexibility.

The study also recommended that the Department establish an Industrial Base Investment Fund (IBIF) to provide better on-ramps for production-ready technologies nominated by emerging innovative suppliers and by company or Department program managers. ODUSD (Industrial Policy) is in the early stages of conceptualizing the IBIF that would be funded to provide better on-ramps for innovation. It leverages and synergizes lessons learned from similar funds and transition vehicles available in the Department and in commercial businesses. ODUSD (Industrial Policy) will continue refining this concept, planning to fund this vehicle by FY07.

Once all five reports within the DIBCS series are issued, the Department will consolidate and review the recommendations; and develop an implementation strategy.

Foreign Sources of Supply: Assessment of the United States Defense Industrial Base (November 2004)

Section 812 of the National Defense Authorization Act for Fiscal Year 2004 (Public Law 108-136) directed the Secretary of Defense to establish a program to assess the degree to which the United States is dependent on foreign sources of supply; and the capabilities of the United States defense industrial base to produce military systems necessary to support the national security objectives set forth in section 2501 of title 10, United States Code. The Department is to use existing data for the assessment program. The Department is to submit to the Congress by February 1st of each year, a report on the assessment program covering the preceding year.

The DoD assessment program described in the first annual report[12], was based on three separate assessments that collectively provided visibility into the extent and impact of foreign suppliers: (1) an assessment of DoD prime contracts valued at over $25,000 for defense items and components, (2) a recent assessment of foreign content in certain defense systems, and (3) comprehensive assessments of the industrial base supporting defense (i.e., the *Defense Industrial Base Capabilities Studies* series of assessments). This report concluded that the Department employs foreign contractors and subcontractors judiciously, and in a manner consistent with national security requirements.

Based on the assessment of DoD prime contracts valued at over $25,000, the report concluded that the Department procures very few defense articles and

[12] Report available on the Internet (http://www.acq.osd.mil/ip).

components from foreign suppliers. In Fiscal Year 2003, the Department awarded contracts to foreign suppliers for defense articles and components totaling just over $1 billion, less than one-half of one percent of all DoD contracts; and only about 1.5 percent of all DoD contracts for defense articles and components.

The DoD assessment program also employed the results of a January 2004, DoD report *Study on Impact of Foreign Sourcing of Systems* concluded that foreign suppliers provide limited amounts of materiel for the systems, and that using those foreign subcontractors does not impact the long-term readiness or the economic viability of the national technology and industrial base. For the systems studied, foreign subcontracts collectively represented about 4 percent of the total contract value and less than 10 percent of the value of all subcontracts.

Finally, the assessment program employed the *Defense Industrial Base Capabilities Studies* assessments completed through November 2004 (*Battlespace Awareness*, *Command and Control*, and *Force Application*). These assessments highlighted those warfighting capabilities most important to 21st century warfighting, where U.S. leadership over adversaries is most important, and where Department attention and resources should be focused. They found that the United States has a lead in the vast majority of the most critical technologies and associated industrial capabilities. For the most part, there are sufficient U.S. suppliers to preclude potential vulnerabilities resulting from dependency on foreign suppliers.

Defense Industrial Base Capabilities Study: Protection (December 2004)

DIBCS: Protection[13] is fourth in the series of five studies addressing the functional concepts framed by the Joint Staff's Functional Concepts and Joint Operational Architecture.

This study identified 629 specific warfighting capabilities supporting Protection. Of these, 440 capabilities were ones in which the United States should maintain a lead of at least one technology generation. These latter warfighting capabilities are associated with 277 critical enabling technologies. The study team assessed 39 of the most important of these technologies and 25 associated component technologies—for a total of 64 priority technologies assessed for industrial base sufficiency. In general, U.S. defense suppliers hold a technological advantage over foreign competitors for Protection capabilities. The study team identified seven Protection leadership or sufficiency of supply issues. Previous DIBCS reports identified six issues in FA and three each in BA and C2. The study team believes that the higher number of issues in Protection and FA is due to the high degree of global competition in the warfighting capability areas associated with actual combat: in this study, of the seven issues, four are issues where U.S. forces have inadequate technology leadership relative to global competitors. As in *DIBCS FA*, *DIBCS: Protection* identified two "Watch List" items,

[13] Report available on the Internet (http://www.acq.osd.mil/ip).

resulting in a total of four “Watch List” items generated in the DIBCS study series to date.

The study recommended that the Department implement the remedies in this report to address the seven industrial base issues identified in the Protection area, and should continue to monitor the two “Watch List” items.

- Seven industrial base issues need additional attention to obtain or sustain the desired degree of U.S. capability leadership or supplier sufficiency:
  - Non-lethal Millimeter Wave Active Denial System;
  - 30-mm Supercavitating-Supersonic Projectiles;
  - Multi-Spectral Camouflage Cover;
  - Regenerative Chemical-Biological Filtration;
  - Plasma Antenna;
  - Active Magnetic Signature Reduction System;
  - Thermo-Insulating Paint for Low Observable Hullforms.

- Two identified technologies are important because they represent unusual technology solutions that are not likely to be part of the U.S. warfighting arsenal, but could pose challenges to U.S. warfighters if possessed by potential adversaries. These technologies have been added to the “Watch List” for further consideration and potential policy remedies:
  - Towed Fabric Balloon Pressure Sweep;
  - Rigid Polyurethane Foam (RPF).

The study team again recommended that the Department establish an Industrial Base Investment Fund (IBIF) to provide better on-ramps for production-ready technologies. These technologies would be nominated by emerging innovative suppliers or company/Department program managers, and implemented via Capability Area Reviews. An IBIF would leverage lessons learned from similar funds/initiatives in the Department and in commercial businesses.

Once all five reports within the DIBCS series are issued, the Department will consolidate and review the recommendations; and develop an implementation strategy.

4.2 Army

Capacity for Armor Plate Steel (throughout 2004)

Support to current warfighting operations requires adding armor protection to unarmored vehicles and fighting positions. Throughout 2004, the Army assessed domestic armor production capacity as at least adequate to meet all military requirements. However, in late 2004 the Army decided to accelerate all programs to completion. This decision necessitated a reassessment and subsequent allocation of

armor plate steel among more than twenty Army programs to ensure the availability of armor plate steel did not constrain production. As a result of the assessment, the Army concluded that manufacturing armor plate steel was not a constraining factor in any of the twenty defense manufacturing sites, including government-owned industrial facilities operating at full capacity to make add-on armor kits. However, the Department subsequently determined there was insufficient domestic capacity to meet all of the Defense Logistics Agency's armor plate steel requirements and authorized a domestic source waiver to ensure timely availability.

Small Caliber Ammunition (January 2004)

The Army completed an ongoing assessment of how best to address a shortfall in small caliber ammunition. The Army decided to invest a total of $31 million in Lake City Army Ammunition Plant and also bring on a second production source. The result of these two actions will be an increase of production capability from 1.2 to two billion small caliber rounds (primarily 5.56mm) per year.

Jammer Production Capability Assessment (June 2004)

Army Communication Electronics Command (CECOM) asked DCMA to identify risks associated with the prime contractor's ability to deliver Self-Screening Vehicle Jammers (SSVJ), a newly developed product for immediate deployment that jams frequencies of improvised explosive devices. Additionally, the assessment was to determine the facility's maximum production rates for these devices.

The assessment concluded that the prime contractor is primarily a research and development facility with limited production experience. However, the contractor has made the initial investment to transition the SSVJ program to full rate production. The contractor plans to outsource key components that it will integrate at the system level in its facility. The assessment concluded that company estimates for increasing unit production were not excessive based on its production strategy and that it has the capability and capacity to produce the desired SSVJ devices under its current contract. The assessment recommended the Department monitor the facility and production capacity expansion plan through 2005.

Meeting Increased Demand for Operational Requirements--Surge Contracting Emphasized in Policy (August 2004)

During 2004, the Army Acquisition Executive emphasized to the Army acquisition community the need to include surge option clauses in contracts for military materiel. Through memoranda and revisions to Army regulations, and subsequently through semi-annual industrial base conferences, the Army Acquisition Executive and Commander, Army Materiel Command have been reviewing actual execution of the

Army's ability to meet growing operational requirements. In many cases, policy provisions proved to be of limited use as the Army exceeded the basic contractual requirement and surge options. The Army has worked to meet additional requirements through multiple approaches. In some cases the Army asked contractors to increase production and sometimes helped existing contractors to expand their capability with direct Army investments. In other cases, the Army reopened solicitations with new market surveys, adding additional contractors to the supplier base.

Army Transformation Industrial Base Study, Future Force Industrial Capability Assessment (September 2004)

The Commanding General, Army Materiel Command (AMC), tasked the Defense Contract Management Agency (DCMA) to assess the industrial base supporting technologies required for transformation of the Army's industrial base. This assessment focused on industrial capabilities that will be required to meet projected Army transformation requirements. The study specifically assessed supporting technologies required for Future Force systems and included Technology Readiness Levels (TRL), item producibility, risk, recommendations, and investment options. DCMA, in collaboration with AMC, assessed Advanced Materials; Command, Control, Communications, and Computers (C4); Information, Lethality; Power & Energy; Sensors; Soldier Systems; Aerial Vehicles; Chem-Bio Defense; and Robotics.

The study team identified and categorized risks in the following areas: technology, producibility, capacity, foreign dependency, financial viability, and sustainment. Areas of risk and mitigating actions are summarized below:

- Advanced Materials: This technology area included titanium, aluminum, aluminum lithium, alumina oxide, silicon carbide, and High Energy Density Capacitors (HEDCs). Identified risk areas included producibility, capacity, foreign dependency, and financial viability. There were several issues requiring further analysis, including a funding issue for friction stir welding of titanium armor. This welding process will be used for aluminum and aluminum lithium armor applications. If aluminum lithium is a selected material for Future Combat System (FCS), there will be competition for this material between the FCS and the Joint Strike Fighter in the 2006 timeframe. There could be a silicon carbide production shortage for FCS requirements. Two years would be required to design and construct a new production facility. A foreign source is the current world leader in HEDC technology.

- C4: DCMA also reviewed Future Force communications technologies including Joint Tactical Radio System (JTRS), military satellite communications (MILSATCOM) and transformational satellites (TSAT) and found risk areas associated with technology maturity, producibility, and capacity. Issues and mitigating options included embedded technology for JTRS which is currently at TRL 5. JTRS (Packaging, Weight, and Power) producibility goals have not yet

been met but a MANTECH program is currently in place. Production and test capacity shortfalls exist at the prime contractor, adding risk to the program.

- Information Technology: DCMA reviewed information technology requirements, including software cycle time and security, bandwidth, and processing. The team found that maintaining existing software takes more time than designing new systems. DCMA recommended the Army start planning for lifecycle sustainment support now. The complexity of software production and integration in systems requirements (system of systems) is a technical challenge. Current FCS plans do not include cyber security plans that address malicious software code. Few detection / isolation tools are currently available. The current allocated spectrum is approaching saturation although bandwidth is available in currently unallocated spectrum. Regulatory changes could mitigate bandwidth shortfalls, but might be opposed by private sector users. In the near to mid-term, the Army should optimize computer task allocations because humans still are more efficient at some processing tasks.

- Lethality: DCMA reviewed three enabling technologies critical to the success of next-generation precision fires. Technologies reviewed included automatic target recognition (ATR), variable thrust solid rocket motors, and low cost/high performance guidance packages. DCMA found risk areas associated with technology maturity, producibility, and capacity. Issues and mitigating options include current generation ATR components that will provide only limited capability at FCS initial operational capability. Army efforts to improve the designs of ATR components are in process and should reduce risks. Process improvements are required to reduce costs for variable thrust solid rocket motors. Current funding profiles limit such improvements. Additional production capacity also is required. Current High-G guidance packages do not meet technical requirements.

- Power & Energy: This technology area included Future Force power and energy technologies, including hybrid electric propulsion (HEP), lithium ion batteries, and fuel cells. Risk areas include technology maturity, producibility, capacity, and financial viability. The HEP design configuration still is pending. There are capacity and financial issues with motor suppliers (dependent on the final HEP configuration). At this time, the domestic battery supplier lacks sufficient production capacity for FCS requirements. Prime vehicle producers are investigating commercial and foreign sources, which would have to be tested and qualified. Fuel cells are still in research and development or early prototype phase. Small scale military applications are still over 5 years away.

- Sensors: This technology area included enabling sensor technology for Future Force applications, focused on the Autonomous Navigation System (ANS). There are risk areas associated with technology maturity, producibility, and capacity. There currently is no established industrial base for perception sensors (terrain perception/obstacle avoidance) in support of ANS. There is moderate

risk in the development of unmanned robotic vehicle autonomous navigation capability (TRL 5). DARPA perceptor and jigsaw programs are driving technology advancements. The unmanned robotic vehicle utilizing ANS will require additional research and development funding in support of Future Force sensor suite size and capability (terrain perception) requirements.

- Soldier Systems: This technology area included ballistic personal protection and night vision goggles. There are risk areas associated with technology maturity, capacity, and financial viability. Issues and mitigating options included: Boron Rich Boron Carbide technologies are not yet at TRL 6. Industry capacity is strained by current demand for small arms protective inserts for body armor and vehicle armor requirements. Accelerated and cyclical demand hinders industry research and development investment. Additional funding is necessary to advance technology readiness of laser hardening for night vision goggles.

- Aerial Vehicles: This area included unmanned and manned aerial vehicles. There are risk areas associated with technology maturity and producibility. The Hummingbird (unmanned aerial vehicle) program requires additional test funding to achieve TRL6. The closure of Moffett Field, the national full scale aerodynamics facility, may impact tests of future programs (manned and unmanned).

- Chem-Bio Defense: This technology area included radiation detection equipment and Anthrax vaccine. Risk areas include capacity and financial viability. Radiation detection, indication and computation (known as RADIAC) requirements are currently unfunded. It must be determined if the Department must guarantee a minimum sustaining production rate to maintain the sole domestic source (Canberra Dover). The single source for Aluminum Hydroxide Gel is located in Spain. And the vaccine producer, BioPort, is a high financial risk; it is 100 percent dependent on DoD business.

- Robotics: This technology area included Future Force robotic technologies such as the Armed Robotic Vehicle, Multi-use Logistics Equipment Vehicle, and the Small Unmanned Ground Vehicle. There are risk areas associated with technology, producibility, and financial viability. Vehicle integration is highly dependent on a lead systems integrator and use of government furnished equipment. There are significant technical challenges associated with the ANS capability required for unmanned robotic vehicles.

  The Army is considering what actions it should take to mitigate identified risks.

Engines for Medium Combat Vehicles (October 2004)

The Army conducted a production capability assessment for the V903 engine used in the Bradley Fighting Vehicle, the Multiple Rocket Launch System, the M9 Armored Combat Earthmover, and the Marine Corps Assault Amphibious Vehicle (AAV7A1). Cummins Engine manufactures the existing fleet of V903 engines.

Cummins work load appears adequate for FY05 and FY06. Workload for FY07 and beyond is contingent upon potential United Defense direct foreign Bradley sales, Marine Corps remanufacturing work that could be moved from organic depots to Cummins (potentially, 500-600 units to be upgraded), and requirements associated with Bradley and Marine Corps vehicles returning from Southwest Asia. The Army discovered one issue. Several unique V903 components are not included in Cummins' commitment to provide spare parts for a ten-year period after production ceases. The Army will closely monitor projected requirements and funding beyond FY06.

Capacity for Light Weight Armor, Aramid Materials (December 2004)

Support for warfighting operations required assessment and allocation of modern armor substitutes for steel and aluminum. The Army assessed industrial capacity for Kevlar, Nomex, and other lightweight armor substitutes. This assessment and consideration of reallocation began in 2003, continued in 2004, and will likely continue throughout 2005. As of late 2004, there were no indications that the Army could not meet all of the priority requirements by carefully allocating these critical materials.

Heavy Transmission Industrial Base Study (December 2004)

The Army completed this study in December 2004 in response to Congressional direction. The study determined that continuation of Alison Transmission production and engineering capability is essential, based on additional requirements. The Army will work to program transmission buys or rework to preserve this critical capability.

4.3 Navy

Surface Combatant Shipbuilding Industrial Base (March 2004)

The Office of the Deputy Assistant Secretary of the Navy for Ship Programs (Program Executive Office, Ships) conducted this assessment. As directed by FY 2004 Senate Armed Services Committee Report 108-46 to specifically focus on the transition from the DDG 51 Class to DD(X) Class surface combatants, the report provides: (1) an assessment of the workload for surface combatant shipbuilders from FY 2005 through FY 2010; (2) an assessment of the financial viability of those shipyards during the same

period; and (3) a plan on how the Navy intends to sustain the unique technical and production skills within that industrial base. The Navy based the assessment of workload for surface combatant shipyards on the shipbuilding profile in the FY 2005 Presidents Budget with a notional distribution of future work. The assessment illustrated the expected variation in total employment at each shipyard resulting from surface combatant program schedules and changes in other Navy and government programs. Navy and industry assessments of the workload projections suggest the transition from DDG 51 to DD(X) production has the potential to negatively impact workload at the surface combatant shipyards. Conclusions regarding the severity of the impact differ, largely due to the application of different assumptions regarding follow-on ship construction. In order to mitigate impact on the industrial base, the Navy is developing the DD(X) acquisition strategy to provide the best value for the Navy, while also considering industrial base viability. Execution of the DD(X) program to meet the FY 2005 lead ship award and follow-on ship construction schedules is critical to support the viability of the surface combatant industrial base. The Navy is confident it can manage the DDG 51 transition to DD(X) and maintain the viability of the surface combatant industrial base.

T700 Compressor Durability Improvement (May 2004)

The Naval Air Systems Command initiated this assessment because T700 compressor airfoils erode rapidly in sandy environments resulting in aircraft power loss, and increased Unscheduled Engine Removals. The study examined the requirement to repair eroded T700 Stage 1 blisks, improve blisk erosion resistance, and extend Time on Wing to improve readiness. A consortium led by Radian Milliparts, and including Airfoil Technology International – Commercial Repair Facility, General Electric Aircraft Engines - Engine OEM, Sermatech-Lehr – Coating Vendor, and Optomec – Laser Powder Metal Deposition Vendor, conducted the study.

The assessment objective was to fabricate a rugged, erosion resistant airfoil lead edge using laser deposition of Devitrified Nano-Composite (DNC) powder (a material that is 1.5 times harder than tool steel). Erosion testing at 750 feet per second (half T700 actual engine tip speed) demonstrated unfavorable performance. The deposited DNC material flaked off and the repaired airfoils suffered more chord loss compared to the baseline airfoil. The result was an uneven, jagged lead edge. Aggressive corrosion of DNC coupons occurred after 100 hours of salt spray testing. The testing revealed that DNC is brittle and has lower erosion and corrosion resistance than the base (AM355) airfoil material. It is clear from the erosion, corrosion and fatigue test results that DNC has a low Technical Readiness Level and does not merit further spending under Phase III Small Business Innovative Research (SBIR) Program. On-going sand ingestion tests are being conducted to evaluate other alternative solutions, i.e., thicker leading edge configuration, or titanium nitride material, etc.

Depot Source of Repair Capability Assessment for the Expeditionary Fighting Vehicle (EFV) Hydro-pneumatic Suspension Unit (HSU) Depot Repairable Items (September 2004)

The U.S. Marine Corps asked DCMA to perform this assessment. It focused on the capabilities and capacities of organic and private facilities to support repair/overhaul and maintenance of depot level components/systems of the Expeditionary Fighting Vehicle (EFV), specifically the Hydro-pneumatic Suspension Unit (HSU).

The EFV HSUs are military unique sub assemblies with no commercial application and are considered "core" to the vehicle and program. The repairs and maintenance currently being conducted at the major combat vehicle depot support similar capabilities required to perform repair/overhaul/maintenance of the HSU and are considered a low risk. Once production has ended, some of the unique HSU fixtures/equipment will be government-owned. Other investment for depot repairs would include the repair tech manual and minor training to the workforce. The availability of internal spare parts or a spare parts kit from the original equipment manufacturer also is a viable option.

JSOW Unitary Industrial Capability Assessment (October 2004)

The Navy tasked DCMA to assess industrial capabilities for the Joint Stand-Off Weapon (JSOW) Unitary (C Variant) Program to support an upcoming Milestone III Decision. The assessment updated two studies of earlier JSOW versions, and included Unitary Variant unique items. The assessment addressed 14 key components common to the JSOW A and C Variants in addition to the industrial base to support the C Variant.

DCMA concluded that the prime and sub-tier suppliers are supporting multiple programs and alternate sources for each could be qualified if desired. The assessment identified two risk areas. Qualification of two replacement subcontractors during the Block II cost reduction program could disrupt the program schedule. There also is a potential for battery delivery disruptions due to possible impacts associated with transferring new battery production between facilities.

Heavy Lift Replacement Helicopter Industrial Capability Study (November 2004)

The Navy asked DCMA to assess industrial capabilities for the Heavy Lift Replacement (HLR) rotary-wing aircraft program in order to support a scheduled Defense Acquisition Board (DAB) Milestone B review.

The HLR industrial base has the ability to develop, design, manufacture, and integrate the HLR. The base is healthy and is expected to remain viable. The analysis identified no problems with sub-tier contractors in regards to lead-times, delivery, etc. Contractors are not having production issues with their product(s) and are not impacted

by either single domestic or foreign sole source issues because potential alternate sources are available. Generally, subsystems/components and the companies that supply them represent low or moderate risk, with the exception of one company currently rated a high financial risk. Most technological hurdles have been overcome to support Lot 1 low rate initial production, scheduled to begin in FY12. However, some technologies remain immature and a Milestone C decision in FY13 will require additional technological maturation.

U.S. Microwave Tube Industry (November 2004)

The microwave tube industry continues to be a DoD-dominated industry—over 85 percent of industry products are used in military applications associated with communication, radars, and electronic warfare. With the continued high level DoD operational profile, the U.S. microwave tube industry sales increased at five to six percent, annually, over the past three years.

Research and Development (R&D) emphasis is shifting to provide operational capability in millimeter and high power DoD applications where the microwave tube performance attribute of efficient power generation make microwave tubes the technology of choice. The DoD R&D leadership is transitioning from the Navy to the Air Force Office of Scientific Research (AFOSR) as Air Force leadership recognizes the need and is providing the critically needed R&D resources.

The Department recently completed Phase II of a Defense Production Act Title III Program effort that improved the quality and reduced production lead-times for critical components (cathodes, filament wire, copper-nickel, and helix tape) for the U.S. microwave tube industry. The Department is monitoring potential unintended negative consequences of the evolving DoD logistics support methodology to Performance Based Logistics (PBL). This move likely will decrease Department visibility into microwave power tube subcontractors and make it more difficult for the Department to monitor and address subcontractor/component problems such as those most recently addressed via the Defense Production Act Title III Program effort.

Two acquisitions have changed the business structure of the U.S. microwave tube industry and it continues to change. L-3 Communications acquired Northrop Grumman's microwave tube operations in San Carlos, CA and Williamsport, PA. Cypress Investment Group has acquired Communication and Power Industry, Inc (CPII) from Leonard Green and Associates. Also, Boeing is marketing its Electron Dynamic Devices operation in Torrance, California, a sole U.S. supplier of microwave tubes for space applications.

In summary, the U.S. microwave tube industry is meeting the current DoD needs, but investments are needed for future applications. The Department is considering a plan to increase investment in microwave power tube technologies.

4.4 Air Force

Joint Fire Fighter Integrated Response Ensemble (JFIRE) Industrial Base Assessment (January 2004)

The Air Force has the largest fire fighter contingent among the U.S. Services and, as a result, has taken the lead to develop equipment that can operate in both combat and non-combat environments. State-of-the-art fire fighting clothing does not provide adequate chemical/ biological (CB) protection for fire fighters. Combining previous CB protective garments with fire fighting gear created heat stress and limited physical movement. The JFIRE is a joint Air Force and Army program to develop a fire fighter protective ensemble that includes CB protection. The JFIRE ensembles consist of the Navy-developed Joint Services Lightweight Integrated Suit Technology (JSLIST) over garment including modified structural helmet, Nomex hood, proximity suit, fire/chemical protection gloves, and protective boots; Self Contained Breathing Apparatus (SCBA); and kit bag. The Air Force assessed the industrial base to develop and manufacture all of the JFIRE components based on the: (1) ability to meet military demand, (2) extent to which production capacity used for the civilian market could be leveraged, and (3) adaptability of military technology to commercial product lines for first responders.

The Air Force addresses chemical protective garments and equipment used in industrial applications, including chemical-resistant clothing, chemical warfare and protective suits, and gloves; and heat and flame-resistant clothing, including fire fighters' turnout gear and industrial fire-resistant garments

In 2001, total sales for the personal protective clothing industry as it relates to chemical and fire protective garments were $1.475 billion (63 percent CB – 37 percent fire fighting). By 2006, the industry expects to see sales increase to about $2.0 billion. The industrial base that supports this market is relatively diverse in that six U.S. and six foreign companies currently manufacture aluminized proximity suits and likely can produce the JFIRE aluminized proximity suit. All identified aluminized proximity suit manufacturers include gloves, helmets, and boots with the suits. Three U.S. and four foreign companies likely can produce the JSLIST. Four U.S. and one foreign SCBA manufacturers have at least one chemical, biological, radiological, and nuclear (CBRN) certified SCBA and can potentially produce JFIRE SCBAs.

Commercial companies, universities, and government research laboratories are developing new technologies and products to better equip emergency responders. Research is ongoing in nanotechnology, integrating antenna technologies within textiles, smart suits with multiple sensors (hazard identification, biometrics), and portable cooling. By establishing requirements and procurement strategies that take into account both military and homeland security/first responder needs, the Department can adopt commercial-off-the-shelf solutions thus facilitating a viable, integrated industrial base and reduced unit costs.

Laser Detection and Ranging (LADAR) Seeker Industrial Base Assessment (January 2004)

LADAR is a solid state system providing near photographic quality images of potential targets. It has potential use in armaments and missile defense. This assessment evaluated the capabilities of manufacturers in the LADAR Seeker industrial base, including key suppliers of components such as laser diodes and pumps, gimbal mounts, and radomes. The assessment specifically included several key armament sector development programs, including Low Cost Autonomous Attack System (LOCAAS), Loitering Attack Missile (LAM), and Precision Attack Missile (PAM).

Programs incorporating LADAR technology are benefiting from a synergistic link between commercial and military research investments. The commercial application of LADAR is still in the early development stages and includes geographical mapping, vision correction, collision avoidance, and surveying. Many of the assessed companies are working on commercial applications, have held contracts within the Department's Small Business Innovation Research (SBIR) program, and have played a major role in developing various LADAR architectures for armaments and missiles.

The assessment concluded that the U.S. military has invested in enabling technologies to support a wide range of LADAR applications through developments in miniaturization, increased computer processing capabilities, maturation of commercial-off-the-shelf technology, smaller, better image capturing components, and prototype devices small enough to operate on aircraft, ground vehicles, and munitions. The LADAR supplier community consists of numerous small businesses with research capabilities and limited production capacity. This industry will evolve as applications are tested and moved to production.

Power Sources Industrial Base Assessment (April 2004)

The need for electrical power is critical to many areas of military operations including man-portable and mounted electronics, space vehicles, aircraft, and missile systems. Over the past two years, the Air Force has conducted or supported numerous industrial base assessments focused on power sources of various types. These assessments have looked at primary and secondary batteries of different chemistries, photovoltaics, and fuel cells. As a result of these studies, a significant amount of information on the manufacturers, the market, and ongoing Research and Development investments is available. The Air Force conducted this assessment to capture and organize that information in a single document.

The assessment characterized the manufacturing base for five different battery chemistries (nickel metal hydride, lithium ion, silver zinc, zinc air, and thermal), two types of photovoltaics (crystalline silicon and thin film), and the fledgling fuel cell

"industry." There are a significant number of manufacturers (both domestic and foreign) involved in each product line or technology. Commercial market demand in several areas (e.g., Li-ion batteries for cell phones) is increasing significantly. Military requirements represent a small fraction of the total demand with the exception of thermal batteries which have limited non-military applications.

The power sources industry includes strong foreign competitors, large multi-national firms addressing the commercial segment of the market, and small domestic niche manufacturers supporting the U.S. military. Many of these small manufacturers are rated as moderate or high financial risks due to declining sales, foreign competition, and limited investment in both R&D and infrastructure.

Air Force and DoD decision makers will use this assessment to inform decisions allocating limited investment funds or system trade offs.

Space Industrial Base Financial Health and Market Analysis (May 2004)

The ability to equip and sustain U.S. military forces is a direct result of having a capable and innovative domestic Defense Industrial Base (DIB). The Air Force is the lead agency for military space. This assessment characterized the space industry sector in terms of the key companies that design, manufacture, test, and operate the majority of DoD space systems (satellites, launch vehicles, ballistic missiles, and ground operations. Industry health through 2012 is impacted by several factors, including:

- Individual corporate and aggregate financial profiles of prime contractors, major subcontractors, and niche commodity manufacturers.
- Trends in sales forecast for government and commercial space systems (including market share assessments and analysis of foreign competition)
- Work force demographics.
- Other issues such as export restrictions and environmental compliance.

The forecasted annual sales for the U.S. Space Sector will remain relatively flat through 2012. Nearly 90 percent of those sales will be to the U.S. government with the majority coming from the National Aeronautical and Space Administration (NASA) and the Department of Defense. Financial analyses on 21 companies comprising the majority of system and subsystem manufacturers indicated that only two of the companies should be considered as other than low risk. A key factor for future financial stability will be the nearly 30 percent of the forecasted market for which sources have not been selected. Among these are several large defense programs including Global Positioning System Block III, Space Based Radar, and Transformational Communications.

Market forecasts indicate a "bow wave" of Research Development Test and Evaluation, and a trough of production, in the 2005-2010 timeframe. This will most likely result in the further reduction/consolidation of manufacturing capability across the

sector, while straining the available engineering workforce. The decline in the space market has had the most notable impact on niche components and technologies provided by smaller manufacturers. Domestic suppliers in areas such as propellant chemicals, space-qualified electronics, space power sources (batteries and photovoltaics), and specialty materials have consolidated to where there are only one or two qualified sources in each area. Frequently these suppliers are finding it difficult to justify the business case to continue production.

Missiles and Munitions Industrial Base Financial Health and Market Analysis (September 2004)

Current munitions planning is based on a "come as you are" scenario with the industrial base restocking between conflicts. Additionally, advances in precision-guided munitions (PGMs) technology have resulted in a more complex manufacturing environment for mass production of conventional munitions. The combination of these factors coupled with the significant downsizing of the missile and munitions industrial base over the past decade increased the need for insight into the infrastructure supporting Air Force procurement of air-launched munitions. To conduct this assessment, the Air Force characterized the Missile and Munitions Sector in terms of the key companies that design, manufacture, and test missiles and munitions (air-to-air, air defense, air-to-surface). Industry health through 2012 is impacted by:

- Individual corporate and aggregate financial profiles of prime contractors, major subcontractors, and niche commodity manufacturers
- Trends in sales forecast for government and commercial space systems (including market share assessments and analysis of foreign competition)
- Work force demographics
- Other issues such as export restrictions and environmental compliance

The Air Force evaluated three prime/system integrators, fifteen subsystem/component manufacturers, one government owned, contractor operated (GOCO) facility, and one government owned, government operated (GOGO) facility.

The forecasted annual sales for the U.S. Missile and Munitions Sector will average $5 billion annually through 2012. Research and development in this sector is less than 10 percent of the annual Department of Defense budget. Air-to-surface munitions accounts for the largest portion of the sales (approximately $2 billion a year) with air defense missile sales close behind. Air-to-air missile production is expected to continue to gradually decrease primarily due to declining Foreign Military Sales (FMS) demand driving an increase in unit cost. Of the 19 companies that comprise the majority of system and subsystem manufacturers financial analyses indicated that 8 of these companies represent other than low risk. Most of those companies rated as medium or high risk are small firms that serve this sector as niche manufacturers of such products as fuses and thermal batteries.

The trend towards structuring weapon procurements as Joint Service programs is reducing the number of development and production contracts awarded to a shrinking industrial base. Barring a significant draw down of inventories, sales in this sector will remain flat. This, combined with the lack of Research and Development spending, will further impact an already weak group of component suppliers. The result will most likely be additional consolidation and/or vertical integration.

4.5 Defense Contract Management Agency (DCMA)

Industrial Assessment of the Weapons Battery Industry (February 2004)

DCMA assessed the financial and technical state of health of the manufacturers of thermal, reserve silver zinc, and lithium oxyhalide batteries that are used in guided weapons. The assessment concluded that the weapons battery industry has some weaknesses that may negatively impact guided weapons programs, within 2 years for thermal batteries and within 5 years for silver zinc batteries. The study recommended the Department develop an overarching strategy for the domestic battery industry consisting of twelve individual strategies: eight for OSD, two for the program offices, one for DCMA, and one for industry. The Department is considering the recommendations.

Aircraft Transparency Sector Analysis (May 2004)

DCMA assessed the aircraft transparency sector and determined that, overall, aircraft transparencies represent a low industrial risk. Multiple qualified domestic sources are available for transparencies on most DoD production aircraft. However, current manufacturing processes for tactical aircraft canopies appear to be reaching technical limitations with respect to producibility and achieving low observable requirements. Additionally, maintenance requirements on current generation transparencies are a significant operations and maintenance cost driver. The Air Force is developing a new, advanced technology transparency for tactical aircraft. Insertion into existing and developmental tactical aircraft has the potential to significantly improve technical performance and greatly reduce life cycle cost. However, a funding gap between the completion of the current technology demonstration phase and insertion into production programs will likely delay fielding of this new technology.

The study recommends the Department consider funding projects through the Defense Acquisition Challenge Program or Technology Transition Initiative.

Aerial Target Industrial Base Study (May 2004)

The Deputy Under Secretary of Defense (Industrial Policy) asked DCMA to conduct this study. The study identified prime contractors and critical subcontractors; and evaluated capacity, capabilities, and potential risks.

The industrial base capability to produce aerial targets is healthy and expected to remain viable, provided procurement quantities are not significantly reduced. Reduced developmental funding coupled with developmental challenges, may impact capabilities to meet future threats. Developmental requirements exist for: 1) a Threat D target which is needed immediately to address an emergent threat, 2) a replacement for the BQM-74F to meet the threat environment and 3) a replacement for the QF-4 inventory that will be depleted in the 2010-2012 timeframe requiring new development beginning in FY06. Many of the suppliers are diversified with other DoD/commercial work and the target business represents a small portion of their total business operations. Critical subcontractors did not indicate that lower-tier suppliers were at risk because of reduced target production rates.

Aircraft Flexible Shafts and Couplings Study (July 2004)

This study validated that Goodrich Aerospace of Rome, NY is the single qualified source for aircraft flexible power shafts and couplings used on virtually all U.S. military aircraft. Goodrich has designed and developed product technical data packages to include the proprietary processes for titanium disks for flexible shaft couplings. Three other domestic firms could qualify as alternate sources given time, money, equipment, and the Technical Data Package for the current DoD flexible aircraft power shaft and coupling.

Seamless Stainless Steel Tubing for Aerospace Applications Industrial Capability Assessment (July 2004)

DCMA conducted this study to address concerns regarding potential lack of domestic sources for corrosion resistant stainless steel utilized by the aerospace industry and defined as specialty metal under Berry Amendment provisions. The assessment was designed to identify the domestic suppliers, assess their dependence on DoD demand, and evaluate financial, regulatory, and other risks.

There are domestic suppliers available at each level of the production cycle of seamless stainless steel tubing and the industry is not dependent on DoD requirements due to strong commercial demand for stainless steel. The study concluded that adequate domestic and DFARS 252.225.7014 "qualifying country" sources exist for seamless stainless steel tubing. There are 21 "qualifying countries" from which to obtain specialty melt, plus the United States, for the manufacture of tubing.

Munitions Capability Analysis (September 2004)

Representatives from the Joint Chiefs of Staff (J-4) asked DCMA to analyze industry's capability, capacity, and surge for 50 munitions programs and variants. The request reflected DCMA's analysis of critical munitions during the Kosovo conflict in August 2001. DCMA has been providing annual updates to J-4, Joint Ordnance Commanders Group, and the Services since that time. The study included prime and significant subcontractors; and addressed manufacturing capacity and lead times, current and surge production rates, production limiting factors, and munitions market and business base analyses.

The study concluded that the munitions industry is dependent on DoD investment which increasingly is driven by the War on Terrorism, Missile Defense, and replenishment requirements. Prime contractor consolidations are complete and the remaining contractors are well positioned for the future.

Crew Crashworthy Seat Industrial Sector Study (October 2004)

This assessment follows one performed previously in which DCMA identified one "key player" in this industry segment as a high financial risk. A leading manufacturer of specialized security/protective products has now acquired the contractor at risk and the new company is well situated to benefit from increased DoD and Department of Homeland Security spending. The study concluded that four other manufacturers are fully capable of producing crew crashworthy seats for DoD helicopters and the crew crashworthy seat sector now represents a low industrial and technology risk.

Energy Constraints on the Defense Industrial Base (November 2004)

DCMA assessed the impact of rising energy costs in order to identify potential problems in the distribution of energy within the defense industrial base.

For a sample size of 60 defense facilities, the total energy costs for 2003 was $318 million, an increase of 7 percent from the 2002 ($297 million in total energy costs). Total energy cost represents 0.41 percent of the average value of shipments. With total energy costs at 0.41percent of sales, energy costs are not a major cost driver for most defense companies. The West South Central area of the United States (Texas, Arkansas) has the lowest energy cost while California and the Northeast face the highest energy costs. Of the major defense industry sectors, the space sector has a higher energy cost due to its use of various fuels and chemicals and concentration in California.

4.6 Defense Logistics Agency

Capability Study of the Lithium Battery Industry (September 2004)

Recent contingency operations have revealed increased demands for Lithium batteries and highlighted challenges in supporting the warfighter. DLA conducted this capability study of the Lithium battery industry to evaluate its ability to produce BA-5590/5390 Lithium batteries to support the warfighter mission requirements during contingency operations and periods of surge and sustainment. The study resulted in a $2.3 million warstopper funded investment to increase production capacity of a single vendor by 121 percent over the first 90 days of surge. The investment provided for pre-positioning of critical materials and equipment. The adjusted rate of return over ten years is a 12.18:1 investment. Stated more simply, the Government would require $27.8 million over ten years to obtain the same level of readiness that DLA obtained through this investment.

Tray Pack Ration Readiness (October 2004)

Tray pack rations are a member of the family of DoD field combat rations. They are used to sustain groups of military personnel in highly mobile field situations. The component items are thermally processed, shelf-stable foods, packaged in hermetically sealed, steam table-size metal or Polymeric (poly) containers. DoD contingency requirements for tray pack rations greatly exceed peacetime requirements. DLA reevaluated issues previously addressed. DLA compared current tray pack ration industrial capabilities to those required to meet contingency requirements. The reevaluation concluded:

The commercial food industry has moved to polymeric trays for shelf-stable food service items. The Military Services have also transitioned from metal tray cans to the polymeric tray for their peacetime requirements. This is in concert with developing new technologies for reducing costs and moving towards commercial applications.

DLA determined that in order to meet projected tray pack ration wartime requirements, it would be necessary to preposition tray pack metal cans and tray pack equipment as the peacetime production of polymeric would prove to be a limiting factor.

During OEF/OIF, the Department experienced shortfalls in polymeric trays; it responded by using prepositioned metal trays and Government Furnished Equipment (GFE).

DLA identified and is aggressively pursing the use of three kilo retort pouches for pump-able items in lieu of fill and seal trays to further ensure the industry's capability to meet both the peacetime and wartime demands.

DLA identified funding under its "critical few" program for FY06 investment of $3 million in GFE to further expand the industrial base capabilities to produce polymeric trays.

Meals Ready to Eat (October 2004).

During OEF/OIF, the Meals Ready to Eat (MRE) combat ration program was able to support military operations. Although the Department identified shortfalls due to funding and logistical constraints, the commercial industrial base was more than capable of providing sufficient MREs. Additionally, during the summer of 2004, the Federal Emergency Management Agency (FEMA) identified a significant un-forecasted requirement of 1.2 million cases of MREs. The Department and industry were indeed capable of meeting the requirements of both OEF/OIF and FEMA.

Domestic Industrial Base for Textiles Apparel and Footwear (October 2004)

DLA conducted a follow-up review of last year's Domestic Industrial Base Study for Textiles Apparel and Footwear to reassess the study's conclusions. The Berry Amendment requires that the Department of Defense acquire textiles apparel and footwear from domestic suppliers. DLA confirmed that the domestic industrial base for textiles, apparel, and footwear may be negatively impacted when import quotas affecting this industry are lifted to comply with World Trade Organization agreements. If the domestic industry falters, the Department may be unable to source certain items from domestic sources.

Extreme Cold Weather Clothing System (October 2004)

Based upon increased demands during OIF, DLA assessed the current production capabilities of the industrial base for the Extreme Cold Weather Clothing System (ECWCS). DLA currently has four ECWCS producers under contract. These contracts contain a surge option clause for increasing production by 50 percent over contract maximum with a 90-day lead time. The surge requirements on contract are based upon the Military Services' war reserve requirements. In FY04, DLA executed procurements to support the Services' OEF/OIF requirements of 160,000 units in FY04 and 80,000 units annually in FY05 and beyond. Based on current on hand assets and contractual due-in quantities, DLA had sufficient material to support the identified requirement. DLA continues to coordinate with Central Command and DLA Defense Contingency Support Team teams in Iraq and Afghanistan. While no immediate industrial base problem exists with ECWCS, it serves to highlight that the industrial base can best support the Services with effective war reserve planning as well as improved collaboration on requirements.

Joint Services Lightweight Integrated Suit Technology Ensemble (October 2004)

DLA conducted a reassessment of the production process for the Joint Services Lightweight Integrated Suit Technology (JSLIST) in 2004. Increased demands since OEF and OIF for the JSLIST have stressed production processes. The 2003 contingency demand for the liner fabric required a 50 percent increase in production that continued through the first part of 2004. Five contractors have manufactured a combined total of 128,000 suits per month. This maximum production rate has fluctuated due to material limitations in the supply chain, specifically carbon beads and liner fabric. In January 2004, liner fabric supplier Bluecher developed beads for the fabric in its manufacturing plant in Germany. The liner fabric made with the Bluecher beads passed all field and chemical testing and is now qualified for use in making the JSLIST suits. Production quantities have increased to 100,000 suits per month and will steadily return to the previous maximum of 128,000 per month in March 2005.

4.7 Missile Defense Agency

Inertial Measurement Unit Industrial and Technology Capability Assessment (August 2004)

This study analyzed industrial and technological capability and financial stability of U.S. industries supporting development, test, and production of Missile Defense Agency (MDA) systems. The study surveyed companies capable of designing, developing, and producing the Inertial Measurement Unit (IMU). The study team visited five prime manufacturers and two key suppliers. The five prime manufacturers were BAE Systems; Honeywell Defense and Space Electronics Systems (DSES); Kearfott Guidance & Navigation Corporation (GNC); L-3 Communications Space and Navigation Division (SND), all located in Wayne, NJ; and Northrop Grumman Space and Navigation Systems Division (SNSD) in Woodland Hills, CA. The two key suppliers were Interstate Electronics Corporation (IEC), Redmond, WA, and Innovative Micro Technology (IMT), Goleta, CA–both key suppliers to L-3 Communications SND. L-3 Communications SND acquired IEC in June 1999. They produce the Micro-Electro Mechanical System (MEMS) and GPS product lines. IMT provides micro sensor fabrication and foundry operations to IEC.

Currently, Northrop Grumman and Honeywell are the two leading IMU producers supporting MDA programs. Northrop Grumman presents the greatest opportunity for Fiber Optic Gyroscope (FOG) and Hemispherical Resonator Gyroscope (HRG) applications while Honeywell leads the MEMS IMU effort. Current MDA applications will depend on FOG and MEMS IMUs with MEMS having the greatest potential for emerging technology applications.

Competition for Ring Laser Gyroscope (RLG) and MEMS will be limited if Honeywell's market strength continues into the future. Honeywell, in partnership with

Boeing, leads the international Joint Direct Attack Munitions (JDAM) production which drives the use of RLGs. The assessment identified no IMU foreign supplier dependencies.

The MEMS fabrication depends on foreign equipment and tooling; therefore, the "Buy American Act" could have potential impact. Because industry IR&D funding is limited, advances in IMU technology development to support future MDA needs will require continued DoD funding. While overcapacity exists within this sector, the study team observed low capacity utilization at most of the prime sites. Insufficient workload may drive this sector to further consolidation in the near future.

LADAR/LIDAR Industrial and Technology Capability Assessment (October 2004)

This assessment updated a March 2003 report analyzing industrial and technological capability and financial stability of U.S. industries supporting development, test, and production of Missile Defense Agency (MDA) systems. The study team identified twelve prime contractors. Two contractors—Arete in Tucson, AZ, and BAE Systems in Nashua, NH—entered the LADAR/LIDAR manufacturing industry since the 2002 assessment. Fibertek, Herndon, VA, remains the sole research and development facility, with prototype manufacturing capability.

With the exception of CTI, the LADAR/LIDAR business is exclusively military and other government work. CTI has approximately 25 percent commercial business. Advanced Scientific Concepts, Santa Barbara, and Lite Cycles are dependent on LADAR/LIDAR production for 100 percent of their business.

Currently, manufacturing capacity is available to meet future demands of LADAR/LIDAR production. Though qualified worker shortages are likely in the future as production expands and security restrictions limit the optical engineering graduates.

Some challenges facing the LADAR/LIDAR industrial base include limited government funding, sensitivity of technology information, contracting mechanisms that limit small businesses, and perceived competition between prime contractors and government laboratories.

Without substantial defense business, LADAR/LIDAR technology development could stagnate. Funding in this area has increased but remains insufficient to support future DoD LADAR/LIDAR industrial base needs. The study recommends continuing initiatives with high returns on investment such as reduced power consumption, size and weight; enhanced signal processing capabilities; and increased sensitivity and resolution capabilities. More specifically, there is significant potential in Advanced Scientific Concept's patented ADVAR ROIC and laser beam forming technologies. Textron's patented diamond cooled laser technology and CTI's laser waveguide technology are also developments of significant interest to MDA.

5. Related Activities

5.1 Title III of the Defense Production Act

The availability of production capabilities for critical defense technologies is an essential ingredient of national security. Title III of the Defense Production Act (50 U.S.C. App. 2061 *et seq.)* is a program specifically designed to establish, maintain, or expand industrial capabilities required for national defense. A key objective of the Title III Program is to accelerate the transition of technologies from research and development to affordable production and insertion into defense systems.

Title III provides financial incentives in the form of purchases, purchase commitments, the purchase or lease of advanced manufacturing equipment for installation in government or privately owned facilities, and the development of substitutes. Title III activities strengthen the economic and technological competitiveness of the U.S. defense industrial base and can reduce U.S. dependency on foreign sources of supply for critical materials and technologies.

In calendar year 2004, the Title III Program had ten projects underway, three of which were completed during the year.

Silicon Carbide Substrates

The physical properties of silicon carbide (SiC) enable the development of semiconductor devices, sensors, and subsystems that can operate in exceptionally harsh physical environments and at higher power levels and frequencies than other solid-state technologies. High power radar, communications, and electronic warfare systems can be greatly enhanced with SiC technology. This Title III project was designed to accelerate the insertion of SiC substrate (wafer) technology into military systems by expanding production capacity, to improve wafer quality, to increase wafer diameter, and to lower wafer production costs. By the time the project concluded in 2004, DoD investment (Title III, Navy, and MDA) totaled $13.7 million, in addition to the contractors' $9.7 million direct cost share investment. This project established three viable, long-term, world-class domestic manufacturing capabilities for military and commercial SiC products. All three companies expanded wafer size from 50mm to 75mm, increased yields by at least 50 percent, reduced manufacturing costs by at least 50 percent, and greatly increased their production capacity.

All three contractors also created jobs and increased revenue as a direct result of this project. One company's revenue based on 3-inch wafers grew to approximately $30 million. In addition, it created 108 new jobs (56 professional and 52 production employees). Another company increased its worldwide market share, more than doubled its revenues, and completed a multi-million dollar expansion of equipment and facilities in three states. The same company also grew from less than 10 employees to over 50 during its contract period. The third company successfully completed a multi-

million dollar expansion of equipment and facilities in two states. The company initiated commercial SiC wafer sales and is now selling 50mm and 75mm SiC wafers.

Combined, the three companies represent a robust, domestic capability for SiC substrates with increasing world-wide market penetration. The three companies are positioned to continue growing by increasing sales of SiC wafers to both the defense and commercial markets.

This new production capability for SiC substrate technology supports critical DoD technology programs like DARPA's High Power Electronics Program, DARPA's GaN RF Program, and the Navy's Radio Frequency Monolithic Microwave Integrated Circuit (MMIC) Producibility Program. The Department and industry now have multiple sources of large area, device-quality substrates. Multiple sources, lower manufacturing costs, and higher yields have led to lower substrate costs for the end user.

Use of SiC semiconductor substrates will result in smaller, lower-weight, lower-cost, and higher-performance electronics and RF/microwave devices for defense systems. This effort is expected to generate savings in defense costs that are many times the projected Title III expenditure, while also strengthening the position of the U.S. industrial base with respect to a critical, state-of-the-art technology.

Laser Eye Protection

The objective of the Laser Eye Protection (LEP) project was to establish a viable, highly responsive, and affordable production capacity for thin-film dielectric coatings on polycarbonate substrates for laser eye protection spectacles and goggles. Thin-film dielectric technologies are expensive and worldwide production capacity is limited. At the start of the project, the world's sole production facility was located in Great Britain and had an annual capacity of only 3,000 units per year. Using Title III incentives, a domestic firm transferred infrared filter coating technology from the United Kingdom and established a capacity to produce more than 16,000 units per year. Furthermore, the project scaled up and optimized production processes to maximize coating performance while minimizing cycle time and cost. The project cut cycle time by 62 percent from 13 to 5 minutes per lens and reduced the baseline cost per lens by 50 percent. The project demonstrated new capabilities including extended IR protection, non-laminated lenses, and the ability to coat commercial-off-the -shelf lenses. The Air Force selected the company as the prime contractor for the Air Force Air Crew Laser Eye Protection (ALEP) program. This industrial capability will provide greater protection from rapidly proliferating laser sources, enabling warfighters to operate more freely, safely, and effectively on and over the battlefield.

Microwave Power Tube Materials and Components

This project was designed to reduce the production and life cycle costs of microwave power tubes (MPTs). The project has fostered consistent, quality-driven process and material improvements in the supply chain for microwave power tube production. This effort complements ongoing defense research and development and manufacturing technology efforts to improve microwave power tube design and production processes.

The project was successful at several levels. At the DoD system level, the project ensured the availability of high performance MPTs with increased performance and reliability for current and future DoD systems. The project also reduced MPT costs of ownership and system maintenance. The DoD savings in MPT life cycle costs resulting from this project are estimated to be several multiples of the cost of the Title III program.

The resultant supplier improvements will be available to the entire U.S. MPT industry. These improvements include higher quality components from suppliers, reduced rework and scrap of MPTs due to failure of components during MPT assembly and test, and reduced MPT technical support needed to solve supplier technical/manufacturing problems. Title III funding of supplier improvements will help sustain production of MPT components. This Title III project strengthened supplier capabilities to meet current and future MPT needs by:

- expanding the raw material supplier base,
- improving the quality and reliability of MPT components,
- developing best-practice MPT industry standards for components,
- reducing suppliers business risk, and
- reducing the total cost of ownership of MPTs through improved quality of components.

On-Going Projects

Thermal Batteries

This is the first project within the Title III High Performance Batteries & Fuel Cells Production Initiative. Military unique, high performance batteries are the only viable power source for many defense systems. The availability of these critical batteries enhances the performance of a wide variety of DoD systems. This project addresses insufficient production capability for several high performance battery technologies. Critical materials and technologies represent gaps that must be filled before advanced defense systems can meet performance and production schedule goals. The objectives of the initiative are to establish, strengthen, and expand domestic sources for advanced battery and fuel cell components. The DPA Title III Program is working with strategic domestic suppliers to mature large-scale production technologies for critical battery components. The project will provide domestic companies with incentives to scale up production and expand capacity. The project will support several potential battery technologies including: thermal,

silver zinc, liquid reserve lithium, lithium ion, nickel metal hydride, and lead acid configurations. The first project underway in the initiative is addressing thermal battery production.

High Temperature Flexible Aerogels

This project will establish affordable production for flexible aerogel materials, nanoporous solids with up to 99 percent open porosity often called “frozen smoke.” The nano-scale lattice and pores provide high thermal insulation with minimal weight and space. Military applications include shipboard insulation, acoustic protection, infrared signature suppression, and energy absorption. The project involves material testing and qualification for potential applications and the establishment of a pilot production capacity.

Yttrium Barium Copper Oxide High-Temperature Superconducting Coated Conductors

The objective of this Title III program is to establish a high-volume, high-quality, affordable, domestic production capacity for Yttrium Barium Copper Oxide (YBCO) High Temperature Superconducting (HTS) conductors. This material is the critical component for defense applications requiring high electrical power, principally directed energy weapons (high power microwaves and electrically driven lasers) and electric drives for warships. Components that will use HTS-coated conductors include: gyrotron magnets, power generators, power converters and transformers, motors, primary power cabling, and magneto hydrodynamic magnets. The Title III Program, Air Force, Navy, and Department of Energy (DoE) provided initial program phase funding. The DoE also is providing several technical/industrial experts to the Title III integrated product team guiding the project. The companies are matching government funding on a dollar-for--dollar basis.

Radiation-Hardened Electronics (RHE) Capital Expansion

This project is making substantial capital investments to establish a capability for production of 0.15 micrometer (µm) feature size microelectronic devices with strategic levels of radiation hardening. The project is using commercially available microelectronics equipment modified for radiation-hardened production. RHEs enable spacecraft to operate in the extreme radiation environments resulting from nuclear threats and exposure to long-term natural radiation. Numerous defense programs require strategic radiation-hardened microelectronics. Without Title III support, these programs will have difficulty achieving their goals and meeting insertion schedules. The Title III effort is part of an overall radiation-hardened microelectronics strategy developed by the Department’s Radiation Hardened Oversight Council. The capability established through the Title III Program will provide RHE having substantially higher operating speeds and will lower the power/size of electronics in spacecraft. The smaller size and higher performance made possible by the Title III capital expansion equipment, combined with advances in radiation-hardened process technology will generate highly leveraged savings for

spacecraft in terms of size, weight, reliability, and launch costs. Significant equipment purchases and qualification testing have been completed to date.

Radiation-Hardened Microprocessors

This Title III project is scaling up production capacities for high performance radiation-hardened microprocessors that will provide significant cost and weight savings for space systems. Higher performance means greater on-orbit processing capabilities and lower ground support requirements. Radiation-hardened microprocessors will enable spacecraft to operate in the extreme radiation environments of nuclear threats and high level natural radiation.

Wireless Vibration Sensors

This project will enable the timely production and fielding of affordable smart sensors that will make Condition-Based Maintenance (CBM) possible. CBM is a critical enabling tool to lower asset lifecycle costs by providing online measurement and quantification of equipment components and an assessment of the condition and maintenance needs of an asset (e.g., an aircraft engine). Incorporating this technology into defense systems will enable more effective maintenance strategies. CBM promises substantial reductions in maintenance costs as well as increased readiness levels across a variety of defense systems.

Advanced Polymeric Materials

This project will transition an ultra-high strength polymer material from a small scale, research and development batch process to a limited production capability. The project is focusing on lowering manufacturing costs to make the material more affordable. Ultra-high strength polymeric materials can be used as metal substitutes for a variety of applications. The material offers significant weight savings potential and is being explored for lightweight munitions, lightweight tactical system components, and high strength structural foams.

5.2 Defense Priorities and Allocations System/Special Priorities Assistance

Title I of the Defense Production Act provides the President the authority to require preferential performance on contracts and orders, as necessary, to meet national defense and emergency preparedness program requirements. Executive Order 12919 delegates these authorities to various Federal Departments and Agencies. The Secretary of Commerce has been delegated the authority to manage industrial resources. To implement its authority, the Department of Commerce (DoC) administers the Defense Priorities and Allocations System (DPAS). The DoC has further delegated authority to the DoD under the DPAS to: (1) apply priority ratings to contracts and

orders supporting national defense programs; and (2) request the DoC provide Special Priorities Assistance (SPA) to resolve conflicts for industrial resources among both rated and unrated (i.e., non-defense) contracts and orders; and (3) authorize priority ratings for other U.S. federal agency and friendly nation defense-related orders in the United States when such authorization furthers U.S. national defense interests.

The Office of the Deputy Under Secretary of Defense for Industrial Policy (ODUSD(IP)) also convenes and chairs the Priority Allocation of Industrial Resources (PAIR) task force. The task force's mission is to ensure industrial resources are allocated to DoD programs in accordance with operational priorities when emergent requirements create competing demands among Services. The task force typically utilizes Special Priorities Assistance to request the Department of Commerce allocate materials or expedite deliveries of defense items in accordance with PAIR decisions. During 2004, the PAIR was heavily involved in prioritizing deliveries of the ballistic backing material used in body armor.

DEFENSE PRIORITIES AND ALLOCATIONS SYSTEM/ SPECIAL PRIORITIES ASSISTANCE CASES - 2004

Date(s)	Item	Assistance for	Summary
01/04 through 09/04	Ballistic Material (11 SPA requests to cover deliveries in 2004)	Army / Marines Corps	Directed prioritization of deliveries of ballistic material used in the production of the Small Arms Protective Inserts (SAPI) for Interceptor Body Armor (IBA).
06/04	Remote Terminal Antennas	NATO	Sponsored industrial priority rating for NATO to procure remote terminal antennas used to provide two-way ground-ground and ground-satellite communications for NATO troops operating in Afghanistan.
06/04 & 09/04	Body Armor (3 SPA requests)	U.S. State Department	Sponsored industrial priority ratings for the Department of State to procure items needed for the manufacture of body armor and directed prioritization of deliveries. Body armor used by U.S. government and contractor personnel training Iraqi police forces.
06/04 & 11/04	CH-47 Chinook Spare Parts (3 SPA requests)	UK	Sponsored industrial priority ratings for the UK to procure spare parts for sustainment of the UK CH-47 fleet operating in Iraq.
11/04	Aerostat for Radio Transmitter System	UK	Sponsored industrial priority ratings for the UK to procure aerostat for its global fallback radio communications system.
12/04	Ballistic Material (2 SPA requests to cover deliveries in FY 2005)	Army / Marines Corps	Directed prioritization of deliveries of ballistic material in FY 2005. Ballistic material used in the production of the Small Arms Protective Inserts (SAPI) for Interceptor Body Armor (IBA).

Source: ODUSD(IP)

Not all SPA requests are a result of PAIR actions. During 2004, the office of the DUSD (IP) executed 21 SPA requests as depicted in the preceding table. Twenty were in support of Operation Iraqi Freedom (OIF) or Operation Enduring Freedom (OEF); thirteen were for U.S. forces, three were for the U.S. State Department, four were for the UK, and one was for NATO. The one non-OIF/OEF request was in support of requirements for the UK.

6. Programs and Actions to Sustain Capabilities

In 2004, the Department acquired and/or maintained facilities, equipment, or components, or took other actions needed to meet projected and actual military contingency requirements. Specifically, the Department:

- Allocated $6 million in FY06 to begin a Defense Production Act Title III project to establish a domestic production facility for high purity beryllium metal.

- Implemented—through a take-or-pay contract arrangement with IBM—a Trusted Foundry Access Program that assures access to leading edge integrated circuit products that can be trusted for use in sensitive defense systems. It also is the first step in a broader strategy to maintain long-term access to leading edge integrated circuit products and to ensure that defense-specific integrated circuits built for sensitive DoD systems can be trusted.

- Propositioned metal trays and Government Furnished Equipment to support accelerated production of tray pack rations; and programmed a $3 million investment in FY06 to expand the polymeric tray industrial base.

- Established the Rapid Assembly Program to increase surge capability for unitized group rations for use outside the United States.

- Invested $18 million in Medical Contingency contracts to gain guaranteed availability to pharmaceutical and medical/surgical items identified by the Services as go-to-war shortfalls. In addition, invested $10 million to gain guaranteed availability to patient movement items (PMI). PMI, such as ventilators and respirators, are critical long-lead time medical equipment items needed to air-evacuate seriously ill or wounded patients between medical treatment facilities.

- For nerve agent antidote autoinjectors, continued a support contract to remedy projected surge and sustainment shortfalls during wartime. The $12 million contract guarantees the availability of sufficient materiel to satisfy the Services' wartime requirements.

- Maintained a commercial asset visibility program (Virtual Wartime Visibility Readiness) to integrate and leverage the commercial industrial base for defense operations. For the cost of $123,000 per year, the Department receives access to commercial inventory valued at over $580 million for potential use in support of readiness.

- Investing $200,000 per year to access global information outside-the-United States commercial assets such as, manufacturing, inventories, logistics support, transportation, storage, warehousing, food service, ration unitization, host nation support, and environmental issues.