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DOD's Dual-Use Strategy

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Summary

As part of its effort to reduce the costs of its military systems and gain greater access to state-of-the-art technologies, the Department of Defense (DOD) is pursuing what it calls a "dual-use" strategy. This strategy seeks to make greater use of the commercial sector in developing and manufacturing military goods. The strategy has two principal elements: acquisition reform to remove the regulatory and administrative barriers that inhibit greater use of commercial technology, and "dual-use" technology programs that actively seek to (a) develop new dual-use technology in cooperation with the commercial sector, (b) insert or "spin-on" existing commercial technology into military systems, and (c) "spin-off" existing military technology into the commercial sector. Acquisition reform has proceeded apace with bipartisan support. "Dual-use" technology programs, however, have generated much debate. While critics have been supportive of the dual-use strategy in principle, they felt the specific program initiatives, with their explicit concern with commercial markets, strayed too far from DOD's traditional programs. The 104th Congress eliminated the most visible of these programs, the Technology Reinvestment Project, but supported two new programs proposed by DOD. How best to pursue DOD's dual-use strategy will remain an issue in the 105th Congress.

What Is Dod's Dual-use Strategy?

The term "dual-use" refers to the character of a technology and/or product that has both military and commercial application. DOD's dual-use strategy is an attempt by DOD to integrate the military technology and industrial base with that of the commercial sector by using more commercially available components in its systems or using commercial production lines to manufacture unique military components. Over the years, DOD has come to rely (the extent to which is matter of some debate) on a dedicated technology and industrial base for the design, development, and production of systems and many of the components that go into those systems. For some systems, the reason for this is clear: there is no parallel demand in the commercial sector (e.g., tanks, submarines, nuclear warheads). However, for other systems (e.g., communications), there is a parallel

commercial demand. Furthermore, even in unique military systems, there are components that are "dual-use" in nature.

What Are the Goals of Dod's Dual-use Strategy?

The primary goals of DOD's dual-use strategy are to reduce the cost of military systems and to gain better access to commercially-driven technology.

There is evidence that certain products designed, developed, and manufactured specifically for DOD cost more than comparable commercial products.[1] Proponents of integration often blame more expensive overhead associated with government acquisition regulations, unique military specifications and production standards, a lack of incentives to employ cost-saving production techniques and, in some cases, lower economies of scale associated with military-dedicated production. Proponents believe that by relying more on the commercial sector and standard commercial business practices, DOD can "piggyback" on the commercial sector's economies of scale and the market's incentives for productivity.

Besides saving money by taking greater advantage of commercial production, proponents of integration believe DOD could also save money by relying more on the commercial sector to develop or co-develop new technologies and products of interest to both sectors. Whereas military needs drove development in certain technologies and products in the past (especially in electronics and aerospace), commercial demands have now become the driving force in some of these areas. For DOD to field the latest technology in these areas, it must try to develop similar technology itself or have access to the commercial technology. While DOD could, and often has, sought to pursue its own parallel development, it does not always keep pace with commercial developments nor does the investment always represent a socially efficient expenditure of resources.[2]

While DOD is primarily interested in lowering costs and gaining access to technology, dual-use proponents also believe that better integration can contribute to better national economic growth. Even though DOD accounts for an increasingly smaller share of the total U.S. investment in research and development, it still is the single largest investor.

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[1] Some estimates range as high as 15 times more expensive for particular items and up to 25% higher for total systems costs (CSIS Steering Committee on Security and Technology. Integrating Commercial and Military Technologies for National Strength: An Agenda for Change. Center for Strategic and International Studies. Washington, 1991. 101 p.). A study by Coopers and Lybrand estimated average cost premiums of 18% for the examples it studied. Some analysts, however, caution about making direct comparisons between military and commercial products.

[2] An often-cited example of this is integrated circuits. Although integrated circuits (IC) were initially developed with private capital, military applications drove further development and provided a critical early market. In the early 1960s, military and space procurement accounted for 90% of IC production. However, by the late 1960s, the commercial market began expanding much more rapidly. By the end of the 1970s, military procurement accounted for less than 10%. During this time, the ICs going into commercial products were faster and more reliable than those going into military systems. A report entitled "Barriers to the Use of Commercial Integrated Circuit Technology in Defense Systems", provides DOD's latest set of recommendations on how to increase the use of commercial ICs in its systems.

According to some, DOD should do what it can to maximize the social benefits of that investment. While DOD may acknowledge economic growth as an additional benefit of a dual-use strategy, its primary goals remain cost reduction and technology access. The Clinton White House, however, does view the dual-use strategy as an integral part of its overall economic growth policies. This linkage to general economic policy raised suspicion among some that the dual-use efforts were addressing broader policy issues at the expense of national security.

Principal Elements of Dod's Dual-use Strategy

There are two principal elements to DOD's effort to integrate the military and commercial technology and production base: acquisition reform and technology programs that emphasize dual-use. Acquisition reform seeks to remove those regulatory barriers and internal DOD practices that inhibit program managers and contract officers from acquiring commercially available products, or from producing military unique products on commercial production lines.[3] Dual-use technology programs actively seek to (a) develop new dual-use technology in cooperation with the commercial sector in such a way that commercial and military application can be pursued in parallel, (b) insert or "spin-on" commercial technology into military systems, and (c) "spin-off" military technology to the commercial sector.

Reform: Efforts to reform acquisition rules and regulations to encourage greater use of commercial technology in military systems have been around for at least 20 years. Congress has shown a great deal of interest in this issue, enacting legislation to make changes and/or instruct the Secretary of Defense to review, establish, and eliminate regulations inhibiting the use of commercial items. Proponents of reform suggest that these past efforts have been largely unsuccessful due to a lack of high-level support (or attention). These regulations have evolved over time to meet various other policy goals (e.g., assuring standardization and quality of military products, protecting the government and the taxpayer from fraudulent and excessive costs, and assuring fair access to Government procurement), and each has developed a constituency both inside and outside DOD. The Clinton Administration raised acquisition reform to the top of its agenda and created a Deputy Secretary for Acquisition Reform-position within the Office of the Secretary of Defense to oversee DOD's efforts.

Reform is proceeding on two fronts: those associated with statutory requirements and those that are essentially internal to DOD. Statutory reform was passed in the Federal Acquisition Streamlining Act of 1994 (P.L. 103-355) and again in the Federal Acquisition Reform Act of 1996 (P.L. 104-106). Among other things these Acts have expanded the definition of commercial items, relaxed cost and pricing data requirements on commercial items, and made more flexible contractual requirements for commercial items.

Internal reforms have focused mainly on military specifications and standards. A process has been put in place that is designed to support continual review and integration of military and commercial specifications and standards (the Defense Standardization

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[3] Those barriers are generally grouped into four categories: unique military specifications and standards; cost/price data requirements and unique accounting methods; technical data rights; and unique contract requirements.

Program). Two major policy directives have been handed down by the Secretary of Defense that have pushed the process forward. The first directed that all solicitations should use performance-based requirements and that program managers must justify in writing why a military specification is being required. The second directive allows firms to adopt a single management system and uniform manufacturing practices for an entire manufacturing facility (the Single Process Initiative).

Technology Programs: Much of the technology in which DOD invests could be considered dual-use. However, in a more traditional approach DOD would be concerned primarily with the military application of a technology leaving subsequent (or parallel) commercial application strictly to the private sector. The "dual-use" approach that DOD is emphasizing seeks to develop dual-use technologies in a way that actively promotes its development and use simultaneously in both sectors. This involves cooperative cost-shared development of dual-use technologies with the commercial sector through industry-led consortia.[4] It also involves an explicit effort to insert, where possible, commercial items into existing systems and in new designs, and to move production of unique military items to commercial lines.

The flagship program for carrying out the technology element of DOD's strategy became the Technology Reinvestment Project (TRP). The TRP evolved out of the Defense Conversion, Reinvestment, and Economic Transition Act of 1992, and originally was a collection of seven programs that supported a range of activities including dual-use technology development, technology diffusion (via extension programs), and the development of manufacturing education programs at universities. The technology development programs were an expansion of an earlier authority that allowed DOD's Advanced Research Projects Agency (ARPA) to enter into cooperative agreements and "other transactions" with industry-led consortia to conduct pre-competitive, dual-use technology development on a cost-shared basis. The model for these cost-shared, industry-led consortia was the Semiconductor Manufacturing Technology consortium (SEMATECH), established in FY 1988 to develop next generation semiconductor processing technology.

Another example was DOD's proposed Flat Panel Display Initiative. This Initiative sought to expand DOD's investment in new flat-panel-display technologies to include investments aimed at helping to create a viable U.S. commercial flat-panel industry from which DOD could buy its displays.[5]

While ARPA received the most attention (and money) for implementing dual-use technology development programs, the Services, too, were given the authority to enter into cooperative research and development agreements (CRADAs) and "other transactions" which would allow them to cooperatively develop technology on a cost-

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[4] For a discussion of the distinction between dual-use technology and dual-use technology programs, see: The Difference Between DOD Programs That Develop Dual-Use Technologies and DOD's Dual-Use Technology Development Programs--A Fact Sheet. CRS Report No. 95-738 SPR. by John D. Moteff. June 21, 1995. 2p.

[5] See: Flat Panel Display (FPD) Technology: An Introduction to the Issues. CRS Report No. 95-10 SPR, by Glenn J. McLoughlin and Richard M. Nunno. Dec. 19, 1994. 6 p.

shared basis with commercially-oriented firms or industry-led consortia.[6] DOD's 1994 Science and Technology (S&T) Strategy mentions that the Services were to develop their own formal dual-use programs, including specific programs aimed at inserting commercial technology into weapon systems. The Services have been slow to initiate such programs.

Issues

There is little disagreement about the need for acquisition reform (at least in the context of commercial items). The Acquisition Streamlining Act of 1994 and the Federal Acquisition Reform Act of 1996 passed with bipartisan support. The Clinton Administration has acted expeditiously on implementing the changes called for in the Act. The biggest question now is whether sufficient incentives have been given to encourage innovative behavior at the program manager and contract officer level who must implement the policy day-to-day.

Another question is once these reforms are implemented, how much money can DOD really save? Much of the motivation behind reform is based on the assumption that the military industrial base is significantly segregated from the commercial base. Examples are many, but the extent to which the base is segregated is unknown. Closer examination shows that segregation can occur at three different levels -- research, administration, production -- and in many cases a firm that segregates one part of its operation may be relatively integrated in the other parts of its operations. Nor is the cost premium associated with segregation well established. Again some cost estimates have been made, but to what extent these examples are indicative of the industry as a whole is unknown.[7] Although any savings may be sufficient to justify the efforts being undertaken, DOD is counting on significant savings to fund planned increases in force modernization in the near future and it is unclear if those levels of savings can be realized. While admitting that it is not possible to estimate total savings to date, or to project future savings, DOD has estimated that it has saved to date, as a result of Milspec reform alone, at least $2 billion, based on a limited number of acquisition programs that it has studied.[8]

DOD's dual-use technology programs have generated much more debate. For some critics, the approach, with its explicit concern on commercializing technology, has strayed too far afield from DOD's primary mission which is to organize, equip, deploy and sustain military forces. Given the inability of projected defense budgets to meet all of the national

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[6] For a discussion on CRADAs, see: Technology Transfer: Use of Federally Funded Research and Development, by Wendy H. Schacht. CRS Issue Brief IB85031. [updated regularly]. CRADAs and "other transactions" are different. CRADAs allow technology to be transferred and information exchanged, and data rights/licenses to be negotiated, but does not involve federal funding of non-federal participation. "Other transactions" do allow federal dollars to be used to support non-federal participation.

[7] The Office of Technology Assessment discusses the difficulty in estimating how much DOD could save from better integration, noting, however, that a conservative estimate of 5% would still result in a few billion dollars per year. (Office of Technology Assessment. Assessing the Potential for Civil-Military Integration: Technologies, Processes, and Practices. OTA-ISS-611. Washington, Sept. 1994. 189 p.)

[8] See: Milspec Reform: Results of the First Two Years. Office of the Under Secretary of Defense for Acquisition and Technology. June 1996. 20p.

security needs identified in the Nation's national security strategy, many Members of Congress feel that DOD should concentrate its resources on more traditional development programs.

There are also those who are skeptical (either philosophically or as a practical matter) of the federal government's ability, let alone DOD's, to plan for and execute programs to accelerate the commercialization of new technologies and products in a economically efficient manner.[9] They would say that this is better left to the private sector. Dual-use proponents, however, suggest that the *laizze faire* "spin-off" model used to explain the diffusion of military technology into commercial markets in the past does not capture the complexity of the interaction between the two sectors and is not a competitive approach in the new international marketplace.[10]

While expressing its support for the goals of DOD's dual-use strategy (to save money and gain quicker access to state-of-the-art technology), the 104th Congress did not support the approach taken by the TRP. The project was eliminated in FY1996.[11] For FY1997, the Administration proposed two new programs, the Dual-Use Application Program and the Commercial Technology Insertion Program. Both are tied much more to specific military needs. Both were funded by Congress at reduced levels. The Administration, however, plans to discontinue providing a separate account for dual-use projects. There has evolved a consensus between the Administration and Congress that dual-use projects should be integrated into regular research programs as just another tool for program managers to accomplish their objectives. The issue for the 105th Congress is to figure out how to encourage reluctant program managers to use their authority to initiate such projects.

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[9] For example, see Claude Barfield. Flat Panel Displays: A Second Look. Issues in Science and Technology. Winter 1994-1995. p. 21-25. In that article, Barfield suggests that the "[flat panel display] initiative hinges on the government's ability to second-guess the market." Ibid., p. 22.

[10] A closer examination shows that in those areas of successful "spin-off" DOD provided critical early markets. With procurement accounts lowered, DOD may no longer be able to provide those early markets. See: Alic, John. et al. Beyond Spinoff: Military and Commercial Technologies in a Changing World. Harvard Business School Press. Boston, 1992. 428 p.

[11] For a greater discussion of the TRP and criticisms of it, see: DOD's Technology Reinvestment Project (TRP):Friend or Foe. CRS Report No.95-86 SPR, by John D. Moteff. Washington 1995. 6p.