DARPA turns to "other transactions"

Allowing government and industry to forge more flexible agreements will enable the U.S. to achieve affordable military superiority

The legacy of the Cold War lives on in defense procurement. In response to that era's threat, a "military-industrial complex" grew up in the U.S. A defense industry capable of producing high-technology systems not needed in the civilian economy played a role in the successful conclusion of the Cold War.

Initially, the separation that developed between the defense and aerospace industrial sectors may have resulted from the military's need for specialized high-technology products. In large measure, however, this split has been perpetuated not by technology needs but by unique business and administrative practices. These government contract business practices stem from mandates imposed by Congress. But they have been exacerbated by the bureaucratic implementation of those mandates and by industry's willingness to accept non-value-added practices and administrative systems as long as the government pays for them.

Characteristics of the government contract system that especially impact R&D include a preference for cost-reimbursement-type contracting and a host of associated administrative and oversight mechanisms. Government-unique accounting systems, cost principles, record keeping, and certification requirements are imposed on defense R&D contractors. Contractor purchasing systems must meet government requirements that discourage strategic relationships between producers and suppliers. Various socioeconomic policies that seem meritorious individually are added to the contract system and together result in lengthy contract clauses, government-unique business practices, and certifications. The result is a system that Sen. Jeff Bingaman (D-N.M.) says "spends millions to save thousands."

Secretary of Defense William Perry's initiative on military specifications and the legislative and administrative measures to implement acquisition reform have had substantial but incremental effects on the procurement system. The system and its specialized industrial base remain intact.

The Cold War is now over. New and diverse threats to national security require a far more agile and responsive acquisition system. Furthermore, high technology is no longer the monopoly of the military. Civilian products often embody electronics, computers, and materials more advanced than similar components that are available to the military.

As Gen. Thomas Moorman said in testimony before the Senate Armed Services Committee, a "revolution in military affairs" is taking place. The gulf war provided many examples of the advances that this revolution has brought. Key components of the revolution include computers and computer networks, advanced software, communications, electronics, sensors, video displays, and other product areas where the civil sector has shown great strength. Clearly DOD needs to be able to tap into expertise in these areas wherever it is found.

by **Richard L. Dunn,** general counsel, Defense Advanced Research Projects Agency

Startling findings

Management consultant Robert Spreng used the "R&D Scoreboard" from *Business Week* and the "Fortune 500 Industrials" to identify industry leaders and the firms that have invested the most in R&D. He then compared these to a list of companies receiving DOD research, development, test, and evaluation (RDT&E) contract awards.

Spreng's comparisons resulted in a number of startling observations, among them that "95% of the industry/group leaders that invested the greatest percentage of their sales in R&D received insignificant or no RDT&E awards from DOD. These are usually the firms that are on the leading edge of technology developments in their industry." Furthermore, "70% of the firms that invested the most total dollars in R&D in their industry/group had insignificant or no RDT&E awards. These 39 leading firms invested $32 billion in R&D." After analyzing this and other information, Spreng concluded, "The bottom line is that a significant share of the most valuable research and product development activity in commercial companies is virtually unavailable to the federal government, despite potential benefits to both parties."

Spreng offers a solution, suggesting that significant "contractual changes are essential in both intellectual property and cost collection requirements if the government is to tap the vast technological resources that are currently available from commercial firms."

DARPA's success

The Defense Advanced Research Projects Agency (DARPA), with fewer than 200 employees and an R&D budget of about $2 billion, has been working for years to obtain access to the best possible technology for the U.S. military. According to John Deutch, CIA director and former deputy secretary of defense, "America's computer strength came out of DARPA." In the gulf war, the F-117A stealth fighter, the Joint STARS surveillance aircraft, and the phased-array radar on the Patriot missile system were all directly traceable to DARPA programs.

The Centaur and Saturn space launch vehicles' liquid hydrogen/liquid oxygen rocket engines were started at DARPA. The M-16 subcaliber rifle would not have made it into the Army without DARPA sponsoring a test program of the M-16's predecessor, the AR-15, in Vietnam. SDIO, the predecessor of BMDO, started with a significant influx of DARPA personnel and technology. Many have credited DARPA with creating the discipline of materials science. In summary, DARPA is DOD's central R&D organization for high-risk, high-payoff research. It has had a spectacular record of success.

Years ago DARPA management recognized, as Deutch put it, that "DOD can no longer afford to have its own industry." Access to the nondefense industrial base—or better yet, integration of the defense industrial base into a single national industrial base—not only would be good for the U.S. economy but also is essential if the U.S. military is to maintain technological superiority in an era of declining defense budgets. Thus DARPA has been a leader in adopting the dual-use strategy of utilizing or adapting civilian technologies for military purposes.

"Other" ways of doing business

Today, technological superiority is not enough; in the current climate advanced technology must be affordable. Affordability has many facets—some technological, others more business oriented. How can DOD take advantage of the private sector investment that Spreng's study shows us we are missing out on? How can we learn from the business techniques used in the private sector? How can we pool resources to drive projects to their successful conclusions and not merely stack up technical reports or place brass-board hardware on the shelf? DARPA's answer entails turning away from the traditional procurement system and embracing "other transactions"—alternative ways of accomplishing the mission.

In 1989 Congress granted the following authority to DARPA: The secretary of defense, in carrying out advanced research projects through DARPA, may enter into cooperative agreements and other transactions with any person, any agency or instrumen-

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ity of the U.S., any unit of state or local government, any educational institution, and any other entity.

In addition, this statute provided for equal cost sharing and avoidance of duplication of effort "to the maximum extent practicable." Advance payments could be made. Recoupment or other payments to the government were authorized. The authority was to be employed only "when the use of standard contracts or grants is not feasible or appropriate."

In 1989, when the statute was originally enacted, "standard" DOD grants were made to universities and nonprofit research organizations for the conduct of basic research. Standard contracts involved the principal purpose of acquiring goods or services for the direct benefit or use of the federal government. Much of DARPA's work involves other activities, such as advancing the state of the art, demonstrating technology, establishing industrial capabilities, and transitioning technology into actual use. These activities are clearly different from simply buying goods and services.

Another feature of standard DOD instruments in 1989 was that they were entered into with single parties. The trend toward joint research ventures was in its infancy in the 1980s. The passage of the National Cooperative Research Act of 1984 accelerated this trend.

DARPA has repeatedly reported to Congress on its use of "other transactions" authority. Congress has reenacted the statute three times, making minor changes without altering the substance of the authority. In 1990 Congress authorized a $50-million appropriation for DARPA to fund consortia to support dual-use technologies employing the new statutory authority. The following year $60 million was authorized. Each year DARPA used these funds to enter into several "other transactions" that were duly reported to Congress. In 1992 Congress appropriated nearly half a billion dollars for a series of programs that specifically mentioned "other transactions" statutes as a funding option.

DARPA has interpreted this statute to mean that "other transactions" are a class of transactions outside the procurement and assistance categories as they were implemented by DOD in 1989. "Other transactions" are not subject to the Armed Services Procurement Act, Federal Acquisition Regulation, Defense Federal Acquisitions Regulation Supplement, or other laws and regulations specific to the procurement system, including the statutes codified in title 41, U.S. Code. Likewise, laws and regulations governing assistance relationships or specific to grants and cooperative agreements are not applicable. Statutes of general applicability, such as title VI of the Civil Rights Act of 1964, are applicable.

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DARPA has entered into a number of "other transactions" with single commercial firms, such as agreements with Gazelle Microcircuits, Cray Research, and Intel. Most of DARPA's 100-plus "other transactions" have been multiparty agreements, most with multiple signatures and some with one company as an agent signing for all members of a consortium. The agreements have names such as the Coordinated Research Agreement, Technology Development Agreement, and other appropriate designations. The legal authority for the agreement is always expressly stated. Agreements range in funding from less than $1 million to $370 million. Government funding is almost always less than half and in some cases a small fraction of the total. Some of these agreements do not involve funding at all but are bailments of property or exchanges of information and test results.

Unconstrained negotiating

Since "other transactions" are not subject to the rules applicable to government contracts and assistance relationships, DARPA can enter into agreements based on commercial practices. The essence of commercial practice is the ability to negotiate terms and conditions unconstrained by preordained rules and forms. This has enabled DARPA to enter into agreements with companies that will not or cannot enter into government cost-

reimbursement R&D contracts. DARPA has been able to make agreements with small venture-capital-supported companies such as Gazelle Microcircuits; with leading supercomputer company, Cray Research, which has never had a government R&D procurement contract; and with industry giants such as Hewlett-Packard and Intel. DARPA has also entered into agreements with divisions of IBM that do not typically do business with the government.

Rather than imposing government cost accounting and auditing practices on these companies, DARPA makes payments based on achievement of technical milestones and accepts commercial audits based on generally accepted accounting principles. The dozens of clauses required in a government procurement contract, as well as pages of representations and certifications, are not found in "other transactions." DARPA's "reps and certs" take up one page.

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Rather than rules and regulations, DARPA's negotiators have to rely on common sense and good judgment to craft an agreement that achieves government objectives collaboratively with industry and maintains the public trust. DARPA often accedes to industry demands for provisions not usually found in government procurement contracts, but only after due diligence—that is, a full disclosure of relevant facts and a well-developed rationale for industry's position.

Allocating patent rights

In 1980 the Bayh-Dole Act provided a uniform and enlightened policy on allocation of patent rights to universities and small businesses receiving government support to conduct research. In 1983 a presidential memorandum extended the policy of the act to cover large businesses as well.

The act allows performers to retain title to inventions conceived or first actually reduced to practice with government funding. The government retains a paid-up license to use the invention for its own purposes, which include competitive procurement. The government also retains march-in rights, which allow it to license the invention for commercial purposes if the titleholder fails to take reasonable steps to achieve practical application, or if other specified conditions occur. There are various administrative requirements involving invention disclosure and election to retain title to the invention. The import of these requirements is that the invention can be maintained as a trade secret for a relatively modest period before a patent application must be filed or the title reverts to the government.

The purpose of the Bayh-Dole Act was both to promote commercial use of inventions made with government support and to give the government certain rights. The act has been successful to a degree. However, it failed to accommodate a number of trends that emerged after 1980. These trends include research joint ventures and the need for the government to leverage private investment and technology.

Although the Bayh-Dole Act does not apply to "other transactions," DARPA uses it as a starting point in negotiations. DARPA requires its industrial partners to make the case that the standard patent clause is inconsistent with the goal of a particular project. Typical DARPA concessions are to delay the effective date of the government-purpose license for a period of years, and to define specifically what are reasonable efforts toward practical application that will preclude exercise of the government's march-in rights. With such measures DARPA can reduce the actual and perceived risk to the partnership during a project's initial phase.

Allocation of intellectual property rights also entails balancing the relative needs and the prior investments of the parties involved. If industry has advanced the state of the art through the expenditure of large sums over many years with little or no government support, the government should be more open to industry's request to maintain a proprietary position. This is especially true if the government's interests are primarily served by having a product available in the marketplace.

The goals of the particular project often define the optimum allocation of rights. For example, DARPA has entered into agreements where one result of the effort is for

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When business and technical data are sensitive, DARPA typically minimizes actual delivery of the data to the government. Information that becomes an "agency record" for purposes of the Freedom of Information Act runs the risk of being disclosed to a competitor or, at minimum, requires a commercial firm to spend time and expense convincing the government that the record should not be disclosed to a requester. In lieu of delivery of sensitive data, alternative ways of keeping the DARPA program manager and agreement administrator informed are used; these typically include meetings, briefings, and delivery of summary reports.

Although most of DARPA's "other transactions" have been multiparty arrangements, they are clearly not the only, or in some cases even the optimum, way to do business. While consortia offer many advantages such as pooling talent, leveraging investments, and developing strategic relationships, not every project or technology development can be accomplished collaboratively. DARPA's experience has been that working out the proper roles and relationships among the industry partners is often more difficult and time-consuming than working out the government-industry relationship. Without the flexibility of "other transactions," it would probably be impossible to reach agreement in many cases.

Cost-shared partnerships

Cost-shared partnerships provide a real opportunity for developing new, less adversarial government-industry relationships. Each project is dual-use in nature, and industry has a strong incentive to push the project to a successful conclusion. Industry self-interest, rather than government oversight, becomes the dominant factor in maintaining the public trust. Each participant has a strong interest in performing as effectively as possible. Added pressure comes from the industry partners who are typically dependent on the success of every other participant.

Use of fixed-price payments triggered by the achievement of technical milestones reduces the need for extensive financial reporting and audit. This also avoids imposition of government cost principles and accounting systems, which are anathema to many commercial firms.

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Operating in a partnership environment is not natural for government or industry. Many traditional attitudes do not work well here. In fact, the stock in trade of the legal profession—focusing on avoiding failure and leaving nothing to trust—is particularly ill suited to developing fruitful partnership relations. Few rules are applicable to "other transactions." This makes many people in both government and industry uncomfortable. For those willing to accept the challenge, however, working in such an environment is particularly rewarding.

A chance to experiment

At a time when government is trying to reinvent itself, and government's role in R&D is being reexamined in light of the Cold War's demise, the authority to enter into "other transactions" gives government agencies an unparalleled opportunity to experiment with new ways of doing business. "Other transactions" permit the deregulation of government-supported R&D.

Government can enter into "partnership" with industry and leverage not only its resources but also its genius and leadership, to the mutual advantage of both sectors. Government is no longer the dominant market for high technology. Government technology developments not only must meet mission needs, but must do so affordably. The dual-use strategy is premised on the view that integration of the government market into the broader commercial marketplace is an important facet of ensuring the affordability of high-technology products for the military. "Other transactions" that are extremely flexible and permit the adoption of commercial practices can be an important tool in achieving affordable military superiority for the U.S.