Pentagon's R&D Chief Roils the Waters

With some unconventional views, Donald Hicks sows controversy as he defends a $42-billion research budget

THESE are turbulent times in the office of the Pentagon's senior scientist, Donald Hicks. He is having some difficulty persuading Congress to spend a record $42 billion on military research and development next year, as much as that proposed for the entire Departments of State, Interior, Justice, and Labor combined. He is under vigorous attack for proposing to slow development of a new single-warhead missile, the Midgetman, which enjoys bipartisan political support on Capitol Hill. And he is at the center of a rancorous debate over the best means to improve military procurement, which could potentially result in a restructuring of his present job.

Hicks is not about to run from controversy, however. A senior weapons physicist who came to Washington last July after 25 years at the Northrop Corporation, he has recently attracted both criticism and praise on Capitol Hill for expressing his views candidly about a wide variety of delicate subjects, ranging from "Star Wars" and the MX missile to pork-barrel grants for universities.

With somewhat unconventional views on topics such as procurement reform, the Soviet threat, and classification, Hicks is praised by some as a fresh breeze at the Pentagon. As an admiring Senate staffer says, "he is not at all a politician or an equivocating bureaucrat. He is less concerned with damage limitation than almost anyone we see." But many others wonder if his candor and tenacity are the right tonic for a technical endeavor that seems besieged on all sides.

Although the annual budget for weapons R&D has jumped by $25 billion since 1980, the program is about to become a victim of its own success. At least four major new strategic weapons systems—Midgetman, Trident II, the Stealth bomber, and the advanced cruise missile—are expected to move from research to production in the next few years, as are a dozen or so major new tactical weapons. With overall budget growth constrained by Gramm-Rudman, the new production lines will place substantial pressures on the R&D account.

The impact of this shift is already evident in the Administration's budget proposal for fiscal year 1987, now before the Congress. Except for a substantial increase for "Star Wars," there is no real growth for military R&D. Competition for the remaining funds is fierce, and nearly everyone on Capitol Hill has ideas about how to spend them and who to give them to. When "everybody . . . is trying to tell me what to do for their own particular reasons, to preserve jobs in the district, or whatever," Hicks says, "that is what I call anarchy."

Donald Hicks. *"Not at all a politician or an equivocating bureaucrat."*

Hicks's priorities are largely those of a technician who disdains the grime of politics. He would prefer that Congress approve 50 new MX missiles based in existing silos, for example, rather than worry about clumsy alternative basing schemes. Last fall, Defense Secretary Caspar Weinberger promised Congress that a new basing scheme would be developed, but Hicks is unenthusiastic because it would cost a lot more. Similarly, he is interested in three warheads—not one—for the mobile Midgetman missile, which could substantially reduce the required number of costly launchers. Two years ago, Congress demanded in budget legislation that only one warhead be used, to keep the weight of the launcher down and to ensure maximum mobility. But again, Hicks says that this decision was not made on his watch, and it may cost too much.

Given a choice between fancy missile-basing schemes and "Star Wars" or the controversial Stealth bomber, Hicks's decision would be simple. In testimony last February before the House Armed Services Committee, he boasted that the bomber, which is produced by Northrop, will set the Soviets "on their rear end because if they want to deal with [it], they are going to have to spend an incredible amount of money." Hicks is also clearly a "Star Wars" enthusiast, unlike his predecessor, Richard DeLauer. In a recent interview with *Science*, Hicks went so far as to suggest that vocal opponents of the program should be barred from receiving Defense Department funds (see box on p. 444).

On many issues, Hicks's views are colored by his long experience in the upper echelons of the defense industry. After obtaining his doctorate in nuclear physics from the University of California in 1956, he worked briefly for the Lawrence Radiation Laboratory and the Boeing Corporation before joining Northrop. Like DeLauer, he served on the Defense Science Board before his appointment, where he became familiar not only with the influential men of military R&D but also with the routine problems of weapons procurement.

Like many of his former colleagues in corporate boardrooms, Hicks believes that the "horror stories" of recent years stem not from waste, fraud, and abuse, but from simple inefficiency, created as much by Congress as by the Pentagon and private contractors. "I think that in some ways we've done a remarkable job of producing complicated weapons systems," he says. "Could they have been done more cheaply, more efficiently? Absolutely, no question about it. The responsibility for that is on the hands of all of us."

Again, Hicks's proposals for reform largely differ from those popular on Capitol Hill. Angered by what it sees as ineffective weapons oversight, Congress has recently begun to involve itself in the details of individual weapons purchases, at a substantial cost to the Pentagon's flexibility. In the defense bill last year, for example, it specified the type of contract (competitive or noncompetitive), the pricing mechanism (fixed or cost-plus), the number and type of operational tests (live or simulated), and the minimum performance capabilities of nearly a dozen major weapons systems.

Directions such as these are maddening to many Pentagon officials, who feel that the route to sound armaments is paved with flexibility, not restraint. "In my view, the problem of excessive government oversight has now grown to epic proportions," Hicks told a conference of procurement officers

last October. "You cannot second-guess or micromanage something and expect that it will be competently [run]." He suggests that weapons requirements be drafted more broadly, with the details left to engineers. Both Congress and the Defense Department should largely keep their hands off, he says, until a system is completed.

One way to accomplish this reform is to classify R&D programs as "secret," a tactic that sharply limits outside meddling. According to a recent estimate in the *National Journal*, the Pentagon has pursued this approach assiduously over the past 5 years, with the classification of the Stealth bomber and other programs pushing the overall budget for classified R&D up by nearly 1000%. Although the practice has been criticized because it can also obscure serious weapons defects, Hicks believes that in general classified procurement works "much better." Program managers "don't have to put up with all this crap, this oversight," he explains, and "people who don't have to know a damn thing about it aren't [allowed] to come in and clutter it up." The point, he says, is not necessarily that more R&D should be classified, but that more of it should be performed according to this model.

An alternative solution is simply to convince Congress that meddling is a mistake, and Hicks has been pushing this in the present round of budget hearings. "Put yourself in the role of the engineer who's working hard at this program, when things are going wrong," he says. "Instead of being open and aboveboard as most guys want to be, [he's afraid that] some guy from the state of Podunk will get up and say, 'See, I told you. This is a miserable place, outrageous guys, terrible engineers, et cetera.' . . . Now you do a generation of that, do two generations of that, and see what kind of manipulations we begin to have everywhere." In short, excessive scrutiny and scapegoating either drive serious problems out of sight or inhibit potentially risky innovation, with the result that weapons are frequently defective or obsolete, he says.

Hicks indicates that his general philosophy is to encourage realism on everyone's part. With regard to the DIVAD, a complex and costly aircraft cannon that served as last year's most notorious example of procurement mismanagement, "I would have said, 'Hey, I can't meet that requirement,' and . . . broken the problem down into several parts." The DIVAD program was killed when the cannons proved incapable of destroying sophisticated Soviet helicopters, a fact that the Army tried to conceal by presenting misleading test results. In an atmosphere of tolerance for the genuine difficulties of military R&D, Hicks suggests, the program could have been altered instead of killed, and everyone would have benefited. (In fact, Hicks has recently proposed a new effort to tackle the same problem at a cost of $20 million for R&D and $9 million for procurement in fiscal year 1987.)

This approach is similar to that outlined in a recent report by a White House commission on defense procurement reform headed by industrialist David Packard. In a report on 7 April, the commission urged that government regulations be simplified; that the Pentagon be empowered to award contracts partly on the basis of technical ingenuity rather than lowest cost; and that program managers be granted additional authority in a streamlined bureaucracy and isolated from outside interference. Although Congress may find some of this hard to swallow, it seems certain to approve an additional suggestion by the Packard group that could mean a change of Hicks's title and a reduction in his influence.

The idea is to create a new position, more senior than Hicks's, with full-time responsibility for both procurement and R&D, to balance more effectively the competing demands of economy and technological innovation and to fend off some of the parochial pressures of the military services (see box on p. 445). At present, this task falls primarily on the Secretary of Defense, who has many other demands on his time, and as a result,

Hicks Attacks SDI Critics

Last summer, Under Secretary of Defense Donald Hicks raised some eyebrows in the academic community when he sharply criticized opponents of the President's "Star Wars" missile defense effort and implied that in the future only advocates of the program need apply for military research grants. "I am not particularly interested in seeing department money going to someplace where an individual is outspoken in his rejection of department aims, even for basic research," he told the Senate Armed Services Committee during his confirmation hearing on 25 July.

In a recent interview with *Science*, Hicks was asked if he really meant that only those who agreed with the agency should receive its funds. "Absolutely," he said. "What I'm saying is that the Department of Defense is given money for ***defense***. Those who want to accept money to help us with the programs we need, we want to have. But I don't particularly view it as appropriate when somebody says we don't like the way you're running the department but we sure like your money."

Hicks emphasized that he is not interested in restricting the flow of funds to the institutions where critics might work, and noted expressly that the Pentagon gives "a lot of money" to the Massachusetts Institute of Technology, despite some critism of "Star Wars" and other DOD policies from its former president, Jerome Wiesner. Instead, Hicks said that he is principally upset about computer scientists who depend in part on DOD support, but voice skepticism about the feasibility of creating the software demanded by a comprehensive missile defense.

"If they want to get out and use their roles as professors to make statements, that's fine, it's a free country," Hicks said. But "freedom works both ways. They're free to keep their mouths shut . . . [and] I'm also free not to give the money."

"I have a tough time with disloyalty," he added. "We're in a situation where we're trying to protect the position of the United States against a power that would like to soak us up. A lot of people don't believe that, but I know it's true. Now, if someone doesn't believe that, that's his perfect right as an American citizen. I feel, if we listen to him, it would take our country down the tubes, but that's his perfect right. . . . If he wants to get his money someplace else, that suits me fine. My money is overall specified to be given to people who feel the same kind of urgency that I feel. . . . All the internal memos in the world are terrific, but when a guy stands up and gives an interview and goes on television, somehow he's not one of us."

The Pentagon's new policy of awarding funds only to those who publicly support its programs remains unwritten, Hicks says. "There's no edict, there's no regulation," he says. In fact, "if somebody comes in to me and says it is vital we give [a critic] some money, this is something we have to have, I probably would not stand in the way because I want the best for the Department of Defense in the overall situation. I'm just saying that for someone who is not vital, who is showing that he is not really a supporter, I don't see why I should make his life easier. He's made ours tougher." ■ **R.J.S.**

the commission said, "everyone is responsible, and no one is responsible" for acquisition mistakes.

Hicks, as well as several others inside the Pentagon, are angling for the new post, but some of the commission members have said privately that it should be given to someone from outside the military community, who could more easily move the Pentagon's procurement policies closer to a civilian model. If Hicks fails to get it, his title will probably be downgraded from under secretary of defense to director of research and engineering. The President has already endorsed the commission's proposal.

No matter what the outcome, Hicks says, he is eager to implement other internal reforms. He has recently won high marks for persuading the services to work together on a new tactical fighter plane and for hammering out an agreement on cooperative research with members of the North Atlantic Treaty Organization. In a particularly innovative move, he has arranged for members of the Defense Science Board to test their recommendations for acquisition improvements by making some of the key decisions on a sophisticated helicopter system known as the LHX, on which the Pentagon will ultimately spend more than $35 billion.

In addition, he wants to shorten the time it takes to move a new weapon from design to deployment, to buy more equipment off the shelf, and to conduct more operational testing in the early stages of weapons R&D, as the Packard Commission suggested. And he is enthusiastic about expanding the role of the Defense Advanced Research Projects Agency from basic and applied research into so-called weapons "prototyping," to obtain a better understanding of potential production problems.

On top of all this, Hicks is paying close attention to several problems of interest to the academic comunity, including the growing number of pork-barrel grants to universities for military R&D. In the interview with *Science* and in recent testimony, he praised the peer-review process and decried the fact that Congress last year instructed the Pentagon to distribute $65 million to specific schools. "Now, Congress has every right in the world to do that. They also have every right in the world to tell us exactly what weapons systems to build, exactly who to hire, exactly what contractors to pick. If they want to do all that I'm sure they can, but it seems like a terribly inefficient way to govern."

On the recent controversy over classifying the fruits of military R&D, Hicks seems inclined to take the academic viewpoint. "It's been true for 30 years," he says, that the Pentagon has tended to overclassify. The reason is simply that stamping something "secret" is often easier than getting it cleared, he says. "The issue here is that we really should try to classify things as little as possible."

Hicks adds that he is not sure "where I come down" in the debate over security restrictions for scientists and students from Eastern Bloc nations visiting U.S. academic institutions. The Defense Department has been pressing the institutions to bar them from access to sophisticated new supercomputers, but the universities say that this is the State Department's responsibility, not theirs, and the National Science Foundation agrees. "I believe I am much closer to [NSF director Erich] Bloch on this than perhaps the rest of the Defense Department," Hicks says. "I think it's an onerous task for the university to have to worry" about where the students are. But he adds, "I also understand the problem of having them pick up our technology."

Despite his characterization of life in Washington as "anarchy," Hicks indicates that he is enjoying himself. Clearly, he is determined not to let it get the better of him. ■ **R. JEFFREY SMITH**

Packard Panel Urges Reforms

Although it carefully avoids any direct criticism of the Pentagon's present management, a recent report from a White House commission is generally scathing in its assessment of how military procurement works. "With notable exceptions, weapons systems take too long and cost too much to produce," said the 28 February report of a blue-ribbon panel headed by industrialist and former deputy defense secretary David Packard. "Too often, they do not perform as promised or expected."

A second report, issued on 7 April by one of the panel's subcommittees, offers an even more disquieting portrait of the way the system now operates. Two principal and wholly unsatisfactory means are used to establish the need for a new weapon, it says. One is "user pull," in which the military services seek the most sophisticated weapon possible, often on the basis of an erroneous view of the Soviet threat and technical risks. The other is "technology push," in which teams of government or industry scientists develop a new invention and "persuade users to state requirements that will exploit" it, the report says. "Because participants in this process tend to push technology for its own sake . . . this method is not less prone to result in gold-plating than user pull."

Once the idea is sold to the Pentagon, a competition begins in which "cost and schedule estimates become highly unrealistic." When the firm with the most optimistic bid wins out, "an army of advocates for special interests" descends on the program to ensure such things as minority and small business participation. Finally, the program must be sold outside the Pentagon, and the program manager "is reduced to being a supplicant for, rather than a manager of, his program," the panel said. Unfortunately, "the resulting huckster psychology" takes its toll, and too often prevents the manager from realistically assessing costs and schedules.

The commission suggests that weapons acquisition can be improved if the Pentagon operates more like a successful commercial business, with short command channels, more budget stability, limited reporting channels, small procurement staffs, close relationships between users and engineers, and a lot more prototyping and testing in the early stages of R&D. In particular, it suggests that the Central Intelligence Agency play a larger role in evaluations of the Soviet threat; that the number of acquisition personnel be cut by 10 to 20%; and that budget cycles be lengthened to 2 years. The panel does not endorse the establishment of a separate "acquisition agency" within the Pentagon, as did a similar group chaired by industrialist W. Peter Grace in 1983. But it does recommend that a cadre of civilian procurement executives be superimposed on the existing bureaucracy, in an attempt to counter excessive influence by the military services.

Too often, the panel explains, the services "have duplicated each other's effort and disfavored new ideas and systems." One solution is let the Defense Advanced Research Projects Agency do more hardware development and prototype testing; another is to hand key decision-making power to a committee cochaired by a new under secretary of defense for acquisition and a new vice-chairman of the Joint Chiefs of Staff, with substantial, direct input from commanders in the field. In this manner, the panel seeks to encourage the use of more off-the-shelf items and the development of more realistic specifications for new weapons. ■ **R.J.S.**