Technology Transfer: New Controls Urged

Proposals to curb exports of militarily significant technology are raising alarm among scientists

A broad reappraisal of policies governing the transfer of technology to the Soviet Union is under way in the Reagan Administration in response to heightened concern about the leakage of militarily sensitive items. Although no firm proposals have yet been developed, consideration is being given to new controls ranging from amendments to the Freedom of Information Act to a voluntary system of prepublication review of technical papers in critical fields. "We have a new awareness of the problem and a new determination to deal with the problem," says Lawrence Brady, assistant secretary for trade administration in the Department of Commerce.

Writing in the 8 January issue of *Science*, Frank Carlucci, deputy secretary of the Department of Defense (DOD), spelled out some recent incidents that have caused concern. For example, he said, the Soviets send scientists to the United States who are "often directly involved in applied military research." One such scientist was S. A. Gubin who came here to study fuel-air explosives and then returned to the U.S.S.R. to develop fuel-air explosive weapons.

The Russians also exploit senior scholar exchanges administered by the International Research and Exchange Board, according to Carlucci. He explains that the United States sends scholars specializing in the humanities to the U.S.S.R., while the Soviets propose scholars who want to study in "fields having military application." Carlucci concluded by saying that the Defense Department "views with alarm the blatant and persistent attempts . . . to siphon away our militarily related critical technologies."

But it is not at all clear how technology transfer can be stopped. Many U.S. scientists, in and out of the government, view with alarm the threats to academic freedom and the openness of U.S. society that could ensue if the government made a determined effort to keep American technology out of Soviet hands. Stephen Walker, director of information systems at the Defense Department, remarks, "To a significant degree we're seeing the price of the kind of society we live in. The openness of our society is our curse and our strength. The worry I have about technology transfer is that if we're not very very careful we'll hurt ourselves more than the other guy."

In recent weeks, as the technology transfer issue has heated up, two Administration officials have suggested ways to deal with the problem. On 7 January, Admiral Bobby Inman, deputy director of the Central Intelligence Agency, spoke at the annual AAAS meeting of the "hemorrhage" of U.S. technology, and proposed that technical papers in various critical areas should undergo prepublication review (*Science*, 22 January, p. 383). These fields of research, Inman said, include cryptography, computer hardware and software, electronic gear and techniques, lasers, crop projections, and manufacturing processes.

On 12 January, the *Wall Street Journal* published an article by Secretary of Defense Caspar Weinberger saying that the Soviets "have organized a massive, systematic effort to get advanced technology from the West. The purpose is to support the Soviet military buildup." Weinberger suggested that industries cooperate in helping to stem the flow of U.S. technology to the Soviets by voluntarily setting up committees to "safeguard essential designs and manufacturing know-how."

But, despite these proposals by Inman and Weinberger, the Administration has come to no firm decisions on what to do to stop technology transfer. Nor, according to Michael Cifreno of the Office of the General Counsel at the Defense Department, is there even unanimity on the wisdom of taking strong steps. Nonetheless, the Departments of Defense, Commerce, and State have reached a stage where they are talking about possible courses of action.

At the Defense Department, says Cifreno, officials believe any of three steps would be helpful. The first is an attempt to amend the Freedom of Information Act so that information that is not exportable is not available. A second possibility is to put more restrictions on DOD contract research and, possibly, even on grants so that foreign students or visitors would need special permission to work on the projects, and research papers resulting from the work would not necessarily be published in the open literature. There is now an executive order that could establish such restrictions. A third possibility is the one suggested by Inman: a voluntary system of prepublication review of papers in a number of fields, similar to a system recently set up in cryptography (*Science*, 31 October 1980, p. 511).

Of these proposals, Cifreno says he personally favors the restrictions on DOD-sponsored research. "My opinion is that restrictions through contracts are the most effective because both sides agree on what the restrictions are," he says.

The most controversial proposal is for voluntary prepublication review of technical papers. A number of research scientists find even the present system of voluntary review of cryptology papers odious. But says Walker, "In the case of cryptography there's a very well established government expertise. In some of these other areas there's not that level of expertise and I don't see how we'll get it." The problem, he says, is "How do you get smart enough people in the government to know what ought to be released? I will maintain that the study of computer operating systems [his own specialty] is one of those areas where we don't have enough technically competent people to know."

William Carey, executive officer of AAAS, is appalled by Inman's suggestion of prepublication reviews. "Even in wartime, such a demand would be an extreme one, and in the absence of a national security emergency it is incongruous. It raises troubling questions involving both scientific freedom and the force of constitutional protection against arbitrary government," he says.

At Commerce, assistant secretary Brady is guarded about his department's plans. "We are embarked with other agencies in looking at which technologies should be controlled. It's not something we can talk about publicly, other than in generalities," he says. He does say, however, that the Commerce Department is talking to U.S. allies about the importance of cooperating in an effort to stem technology transfer. During the third week of January, COCOM, a

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group of 14 Western nations and Japan that reviews controls on technology transfer to the Soviets, met in Paris. The United States proposed that technology, rather than simply products, be interdicted. Thus instructions for how to make a computer chip would be controlled just as chips themselves are controlled. "I think our allies will be responsive," Brady says, but he did not explain how this could be accomplished.

Brady remarks that the Commerce Department also plans to increase its efforts to detect illegal technology transfers. The department currently has a field office in New York but it plans to open two new offices in San Francisco and Los Angeles. As part of this detection effort, says Brady, "We will work more closely with customs, the FBI, and the intelligence agencies."

In addition, the Commerce Department is trying to clarify what constitutes pure research and what is applied research. The department places export controls on applied, but not pure, research in sensitive areas. A Commerce Department spokesman says the department is well aware of how difficult it can be to draw dividing lines between pure and applied research. However, he says, "One reason we are trying to clarify this is to work out something acceptable to the academic community."

The State Department, says foreign service officer James Jatras, plans to continue to review scientific exchange programs. "We review the programs of all exchanges coming to the United States with concerns of technology transfer in mind," he says. For example, in the exchange programs sponsored by the National Academy of Sciences, the State Department determines whether the scientists will be exposed to any sensitive technical data, especially data with direct military applications. If so, the State Department either does not approve the exchange or it approves so long as certain restrictions are agreed upon. "If you have sensitive work going on at a university at the same time as you have a visitor from the Soviet Union, it is not too much to ask that the visitor not have access to that research," says one State Department official.

Another effort under way at the State Department, according to Jatras, is to study whether it is legal for the State Department to refuse a private visa. The exchange programs in which Soviet scientists have been kept out of the United States are government-funded, and in those cases it is clear that the State Department has control over the situation. But, says Jatras, "We are not sure under what circumstances it is possible to refuse a private visa for the purpose of preventing technology transfer. Would we have any legal authority to refuse a visa?"

The private visa problem has not, so far, been an issue because the State Department has been able to handle potential problems informally. State Department officials talk with the U.S. sponsor of a visitor and ask the sponsor to cooperate to prevent the visitor from having access to sensitive data. "In the past, sponsors have been cooperative," says Jatras.

Whatever the federal government decides to do about technology transfer, it will be deciding soon, Cifreno predicts. "The people who want to play in the game are up to speed and the process is almost at a point where we are ready to take our best stab at doing something about it," he says.

But, by its very nature, the technology transfer problem can have no truly satisfactory solution. Cifreno remarks that federal officials recognize this and that, after taking some action, they will move on to other things. Technology transfer will still go on, but its moment in the limelight will have passed.

—GINA KOLATA

Classification Standards Tightened

Reversing a 30-year trend toward reducing classified information, the Reagan Administration plans to increase the scope of the government's authority to classify. A draft executive order, dated 23 December 1981 but not yet signed by President Reagan, lays out the details.

- The most recent executive order on classification, which was signed by President Jimmy Carter, prohibits classification of "basic scientific research information not clearly related to national security." The Reagan order does away with this prohibition.
- The Reagan order says that the government can classify the research products of scientists funded by grants even when the agency that administers the grants cannot itself classify. This would apply, for example, to work funded by the National Science Foundation.
- The Carter order prohibits classification of any product of "nongovernment research and development that does not incorporate or reveal classified information to which the producer or developer was given prior access." For example, this provision would prohibit classification of the *Progressive* article on atomic bombs. The Reagan order does away with this provision.
- In the Carter order, there was a balancing test specifying that if the need to protect certain information is outweighed by the public's interest in disclosure of the information, the material should not be classified. The balancing test is eliminated in the Reagan order.
- According to the Carter order, if there is reasonable doubt about whether to classify information, it should not be classified. The Reagan order says that if there is reasonable doubt, classify.
- The Carter order specifies that there be a mandatory review of classified material after 6 years. The Reagan order eliminates this time limit, saying instead that material should be classified "as long as required for national security considerations."

The Reagan executive order on classification is the fourth such order in U.S. history, following orders by Truman, Eisenhower, Nixon, and Carter. In the opinion of Allan Adler, an attorney for the Center for National Security Studies in Washington, D.C., each of these previous orders "deliberately set out to reduce what was classified, to sharpen and clarify classification standards, and to reduce the number of people with the authority to classify." The Reagan order goes directly against this trend, he believes.

Adler thinks that the Reagan Administration is overreacting in its attempts to prevent leaks of sensitive information and to control technology transfer. Of particular concern to him is that this most recent draft of the Reagan executive order on classification is even stronger than the first draft, which came out in October. A final draft is expected this month.

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