War With Iraq Spurs New Export Controls

Over the objections of U.S. companies, the Bush Administration is readying new rules on high-technology exports

THE PANICKY EXIT OF WESTERN TECHNICIANS from the Persian Gulf last summer and, now, Iraq's poison gas, biological weapons, and Scud missile threat have forced many governments to recognize that the Persian Gulf nightmare—Iraq's hardware, principally—was invented in Europe and the United States. That, in turn, has prompted the U.S. government to look for a better way to prevent dangerous technology from falling into the hands of "bad actors" like Saddam Hussein. The Administration's initial solution is to be unveiled on 16 February: new controls on the export of high-technology goods by U.S. companies that will go into effect this year.

Even before seeing the rules industry is balking. No one faults the government's aims or its decision to move rapidly in this campaign. But quite a few high-tech companies are grumbling about its methods. They say they have not been fully consulted about the economic damage the new policy may do, and they fear that they will be asked to bear a greater burden than their competitors in Europe and Japan. They also point out that it was not U.S., but European, companies that contributed heavily to Iraq's black military projects (see box), so the new controls could end up penalizing the good guys for the sins of the wicked. Without cooperation from all the industrial nations, says Richard Seppa, an executive at Tektronix, Inc., a maker of high-tech oscilloscopes, and adviser to the Commerce Department, the export rules are merely "symbolic...all they do is create uncertainty and confusion."

Although the new rules are still being formulated, *Science* has obtained a copy of the draft "control lists," the guts of the new regime, describing the types of hardware that will have to be licensed for export. The drafts indicate that the Administration is planning a significant expansion of bureaucratic controls. U.S. companies that make such things as chemical process equipment, fermentation equipment, computers, sophisticated analytical devices, and metalworking machines will be particularly hard hit. And insiders say the list of controlled countries will go beyond the usual suspects (Argentina, Brazil, India, Iran, Iraq, Israel, Libya, Pakistan, South Africa, Syria) to embrace as many as 20 or 25. If so, the list will probably include some European nations.

All this is welcome news for a strange coalition of bedfellows—those who take a hard line on exports, including people in the traditional arms control movement, such as Gary Milhollin of the Wisconsin Project on Nuclear Arms Control, and conservatives in the military community, such as former Defense Department trade official Stephen Bryen. Both think the government should be more aggressive in stopping exports of militarily useful technology. Bryen says the U.S. policy of "tilting toward Iraq during the 1980s" was "wrongheaded," and the sale of strategically important goods was "an unprecedented blunder" that "could have been prevented" if Pentagon officials like himself had had their way. Bryen thinks the government must see to it that military concerns "cannot be overruled by a faceless Commerce Department bureaucrat" hoping to promote foreign trade.

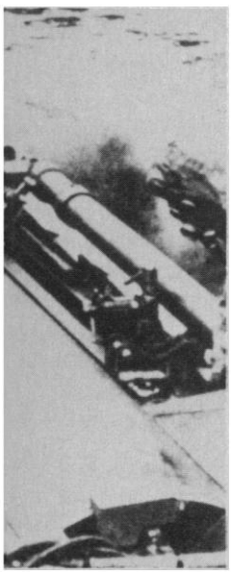
But officials of U.S. companies are particularly upset because the new trade policy is being imposed just as they thought export controls were loosening up. Only 7 months ago, the United States and its allies agreed to end trade restrictions on many items that were covered by the Committee for Multilateral Export Controls (COCOM). This agreement was designed to prevent the Soviet Union and its satellites from getting access to

How Western Technology Aided Iraq's War Machine

The extent to which Iraq built up its war machine with Western help has become painfully clear in recent months, first as German prosecutors began investigating the misdeeds of domestic businesses and, later, as other governments began to ask where Iraq had obtained all this sophisticated weaponry.

The Soviets supplied Saddam Hussein with the Scud missiles he has used to terrorize Israel and Saudi Arabia, and German engineers helped increase the Scud's range. The factories that provided Iraq with nerve and mustard gas were also built with West German expertise and technology. Brazil helped Iraq start an infant nuclear weapons industry, importing equipment from Switzerland, Italy, and—once again—West Germany. Hussein's personal bunker was designed by West Germans, and the reinforced hangars for fighter planes were designed by Britons.

The United States contributed less to the Iraqi arsenal, but, according to a staffer on the House subcommittee on government operations, the helicopter that carries Hussein to and fro is U.S.-made, and a couple of highly sophisticated oscilloscopes in Iraq's SAAD-16 long-range missile development complex were made in Oregon by Tektronix, Inc. Last July, the U.S. Customs Service stopped a New Jersey firm called Consarc Corporation from shipping a set of specialized metal furnaces to Iraq, virtually as they were about to leave the loading dock. Although they had been legally licensed for export to a center that claimed it was making artificial limbs for people injured in the war with Iran, U.S. military officials think the furnaces were destined for the missile complex, possibly for use in manufacturing long-range warheads. After reviewing Commerce Department records on this and other cases in October, Representative Doug Barnard (D-GA) reported that between 1985 and 1990, U.S. companies received licenses to export more than $1.5 billion in "dual-use" goods (military and commercial) to Iraq. ■ **E.M.**



Twin threats: *Iraq's chemical weapons and Scud missiles were aided by Western technology. (DOD photo of Soviet troops with basic Scud in the USSR)*

the latest and best technology produced by the West. With the collapse of many communist governments in the Soviet bloc, the COCOM members agreed that it was safe to open the floodgates to East-West trade.

No sooner had these restrictions been lifted than the United States found it necessary to mobilize an entirely new set of trade barriers, this time aimed at countries like Iraq. The best available tools were laws that control nuclear technology and a series of informal international agreements designed to slow the spread of missile, chemical, and biological weapons technology. However, the problem for U.S. industry is that the United States, so far, has not won a broad commitment from other nations to tighten the rules.

The United States should not act unilaterally, but should keep in step with its allies, says Eric Hirschorn, executive secretary of the Industrial Coalition on Technology Transfer and himself the former chief export control official at the Commerce Department. He says his coalition represents the "big ten high-tech trade associations," including companies that make electronic devices, software, computers, semiconductors, and aerospace products. "It's inappropriate to impose unilateral controls while we're out trying to convince other people to climb on board." If the United States acts alone, Hirschorn says, other countries may "drag their feet because they're making sales in the meantime." He also worries that the new rules will be so broad and ambiguous that they will "frighten off the honest and not deter the dishonest."

Representatives of the chemical and electronics industries have also been lobbying quietly but intensely behind the scenes for the past 4 weeks to get the Administration to hold off on any massive, unilateral expansion of export controls. The Administration did stop a congressional attempt to overhaul the system last November when President Bush vetoed a broad revision of the export control laws. He objected that the legislation intruded too much on executive authority. But in issuing the veto, Bush pledged to impose stiff controls by presidential directive within a matter of weeks. Changes have already been made in the way the White House coordinates export policy, and the remainder of the directive will be announced on 16 February.

Industry officials say they haven't yet seen the rules, and even the government may be uncertain of the details because the final draft has not been approved. This makes it hard for industry to comment on the potential impact. Says one adviser to the government: "I've got the mushroom syndrome: they keep me in the dark and feed me horse shit." The Commerce official responsible for coordinating the effort, James LeMunyon, former chief of the electronic industry's lobby in Washington, declined through a spokesperson to make any comment.

Of particular concern to the Electronic Industries Association and the Chemical Manufacturers Association is the decision to change the description of new types of equipment dealing with missile and chemical weapons technology to be controlled by the lists. In the past, only items that were "specially designed" for certain purposes were covered; in the draft list dealing with missiles, that phrase has been removed, so that the rules now apply broadly to "production equipment."

The chemical and biological list would

Academy Backs Export Overhaul

The toughest question for U.S. export control officials to answer may be the one raised this week by a new study from the National Academy of Sciences—Who's in charge?

The report*—written by a 22-member panel chaired by Roland W. Schmitt, president of Rensselaer Polytechnic Institute, and Major General William F. Burns of the U.S. Army—supports the thrust, if not the details, of the recent shift in the focus of U.S. export policy away from the Soviet threat. But in 390 pages of close analysis, the panel finds that authority for managing U.S. exports is badly muddled, and that federal agencies spend far too much time fighting among themselves. "A disproportionate amount of bureaucratic resources are expended in resolving disputes," the report says, "rather than administering and enforcing the export control system."

The best remedy, according to Schmitt's panel, would be for the White House to reorganize the whole system from top to bottom. The panel makes proposals in three general categories: improving governmental structure, redefining the system's purpose to reflect changes that have occurred in the world since controls began in 1949, and targeting the controls more selectively so that they do not needlessly injure U.S. manufacturers.

The report strongly criticizes the system's present structure. "Over a dozen agencies" in the U.S. government attempt to limit spread of dangerous technology, the report says, including missiles, and chemical, nuclear, and biological weapons. These agencies are governed by a mind-boggling "multiplicity of statutes, with differing objectives and criteria." The system is plagued by "jurisdictional disputes," "overlapping enforcement," "outdated and confusing U.S. control lists," "ineffective dispute resolution," and "insufficient judicial review." The Schmitt panel's solution is to have the president issue a national security directive putting everything under a single leader: the Commerce Department's Bureau of Export Administration.

The system's goals need renovation just as much as its governance, the Schmitt report says. It urges the government to drop the old ideologically based strategy of denying technology to the Soviet Union and China. Instead, the government should concentrate on new dangers posed by "outlaw" governments, such as those that aid terrorists. As the report points out, if there is to be any effective control of missile technology, the system will have to have the cooperation of the Soviet Union and China. It would make sense to convert their status from "target" to "partner" in the export control system of the 1990s. Unless the United States adopts a strategy that other powerful nations agree with, the panel says, its controls will have little impact.

In the third category—methodology—the report recommends that the government move from the present informal approach to a more structured arrangement that would make it easier for industry and the general public to understand what is going on and to participate in decision-making. The report says lists should include only items that most people agree are truly strategic. It even suggests that the casual approach of the past has led to the omission from export controls of the "smart weapon" technology used so effectively against Iraq. ■ **E.M.**

*"Finding Common Ground: U.S. Export Controls in a Changed Global Environment" (National Academy Press, Washington, D.C., 1991).

impose controls on all "fermenters, especially vessels having a self-sterilizing capability," and all "high efficiency particulate filters." Fifty "precursor" compounds useful in making weapons may be regulated, as may a long list of living organisms, including the lowly *Salmonella* and *E. coli* bacteria. One clause extends licensing to "process control instrumentation or computer systems especially designed for use in highly automated facilities, for the purpose of remote plant operations...." The manufacturers claim that most new plants use sophisticated controls of this kind, so the rules would have a broad impact. Says Robert Stevenson, chairman of an advisory group on biological export controls and director of the American Type Culture Collection, "It's true that [items such as fine filters] are needed for the manufacture of biological weapons, but on the other hand, they are so readily available from so many sources that controlling them is a virtual impossibility."

It is not yet clear how the Administration will sort out the conflicting demands of the arms controllers and the business chiefs. But the present hiatus in trade with the Persian Gulf may provide a good opportunity for establishing a new system of export controls. For as Gary Milhollin says, the embargo against Iraq has "put everything on hold for the moment; once it ends, we will be back in the soup again."

■ ELIOT MARSHALL

U.S. Bio-Defenses Faulted by GAO

The Defense Department's program to develop vaccines and drugs to protect U.S. troops from biological weapons could get its first real test in the Persian Gulf this year, but it is already under attack on the domestic front. A General Accounting Office (GAO) report released on 28 January by Senator John Glenn (D–OH) says that the Pentagon may have paid for many less-than-critical projects, and it may be duplicating work already being done at civilian centers like the National Institutes of Health and the Centers for Disease Control.

Since 1984, the U.S. military has spent about $370 million preparing for biological warfare. The budget for these efforts has grown more than 120% in this time, leveling off at around $66 million last year. But GAO found that at least 20% of the expenditures ($47 million) went to projects directed at organisms that were "not validated" by intelligence authorities as true military threats. Another 20% went to projects for which not enough information is available to make a judgment, the GAO says. To Glenn, this is strong evidence of "mismanagement."

Moreover, Glenn argued, military researchers apparently did not make adequate plans to supply troops in the Persian Gulf with a vaccine against predictable threats such as anthrax, a bacterium that infects cattle and sheep and can kill humans in a matter of days. Iraq has reportedly investigated using it in weapons. The government placed "rush" orders for production of anthrax vaccine late last year, according to experts on chemical warfare outside the government, such as Elisa Harris of the Brookings Institution.

Officials in the Pentagon's press office and an assistant to the Army's surgeon general declined to comment, saying they had not had time to study the GAO report.

In the past, some members of Congress, including Representative Wayne Owens (D–UT), have proposed moving civilian aspects of this research out of the Pentagon and into the Public Health Service. Pentagon officials resisted the move, saying military-funded research is focused strictly on defense against weapons. In response to a question from the Glenn committee in 1989, Robert Barker, an assistant to the secretary of defense, wrote: "There are no 'non-military' portions of the [Biological Defense Research Program]. The biomedical research...is focused on militarily relevant problems, with the goal of developing products and information for use in medical defense of U.S. troops against biological warfare attack." If the GAO report is correct, however, military research was not so tightly focused.

When GAO's auditors asked military officials why they had not limited themselves to biological-warfare threats "validated" by the Armed Forces Medical Intelligence Center, they responded that they believed "the intelligence center's interpretation of threat agents was too narrow." GAO points out that unless military officials accept some well-defined limits, they will be able to justify doing research "on virtually all biological agents."

As for overlap with other agencies, GAO noted that the Pentagon's efforts included projects on dengue fever, which has been targeted by the Centers for Disease Control and NIH, and Venezuelan equine encephalitis, which is being studied by the Department of Agriculture. GAO comments that because the Army "does not coordinate its research with federal civilian agencies, [it] cannot ensure that its research is not unnecessarily duplicating" other agencies' investigation of the same organisms. ■ ELIOT MARSHALL

Methanol-Powered

With the war in the oil-rich Middle East raising new concerns about possible gasoline shortages, it may come as a welcome surprise that U.S. automobile makers are about to take a historic step: They are revving up for the first commercial production of cars designed to run on a fuel other than gasoline, in this case methanol. In October, the Environmental Protection Agency (EPA) gave General Motors permission to start making its methanol-powered model, a modified Chevrolet Lumina, the company will begin selling in California in the 1992 model year. Meanwhile, the Ford Motor Company is well along in developing methanol-powered versions of its compact Escort, mid-size Taurus, and full-size Crown Victoria. And Chrysler also has a methanol model in an advanced stage of development, as do most of the major foreign car manufacturers.

Gasoline conservation wasn't the main reason that the U.S. automobile companies began developing cars powered by alternate fuels, however. They were more concerned about meeting air pollution standards, and there methanol has an advantage over gasoline. It burns more cleanly than gasoline, releasing less of the smog-causing hydrocarbons and nitrogen oxides. That's why the first methanol-powered vehicles will be marketed in California, the state with the most stringent emission control standards in the country.

Methanol has other advantages as well. it has an octane rating of 100, compared with 93 to 97 for gasoline. That allows engines to run at higher compression and therefore more efficiently, says Roberta Nichols, who manages Ford's alternative fuels program. Methanol also helps vehicles perform more efficiently because it has a better "flame speed" than gasoline, which speeds burning in the cylinders. And methanol has a high heat of evaporation, which helps to pull heat away from the engine. So it may be possible to reduce the weight of methanol-powered cars by using air-cooling radiator systems, instead of the heavier water-cooling systems.

Aside from such practical benefits, methanol cars could have special appeal for drivers because they are lively. In acceleration tests conducted at the Ford Motor testing grounds near Dearborn, Michigan, the Crown Victorias were able to go from 0 to 60 miles per hour in 11 seconds, a half-second improvement over the gasoline-powered models, according to Ford. The smaller Ford Escort, when powered by methanol, picked up one second in similar trials. These results