

Testimony of Gary Milhollin

Professor Emeritus, University of Wisconsin Law School
and
Director, Wisconsin Project on Nuclear Arms Control

Before the Committee on Governmental Affairs
United States Senate
May 26, 2000

I am pleased to appear before this distinguished Committee to testify on the export of dual-use technology. I would like to submit three items for the record. The first is an article on supercomputer export controls that I wrote for the *Outlook* section of the *Washington Post* on March 12, the second is an article on Iraqi procurement efforts that I wrote for the *New Yorker* magazine on December 13, 1999 and the third is a report entitled “25 Myths about Export Control” that my organization prepared a few years ago but which is still relevant to the issues we face today.

The Committee has asked me to comment on two concepts that have been proposed for use in U.S. export controls. The first is known as “mass market status;” the second as “foreign availability.” The Committee has asked what the effect would be on our national security if these concepts were adopted as U.S. policy.

The two concepts are now incorporated into S. 1712, the bill recently reported by the Senate Committee on Banking, Housing and Urban Affairs. In my judgment, if this bill were enacted it would overturn and to a great extent nullify the system of export controls that the United States has built up over the past half-century. Our present law attempts to strike a balance between national security and freedom of trade. S. 1712 does not. Instead, it is a one-sided list of provisions advocated by commercial interests that have long opposed any form of export control. It would be more accurate to call the bill in its present form the “Export Decontrol Act.”

Items used to make nuclear weapons and long-range missiles

One of the most alarming things about the bill is that it would decontrol a series of items that are used to make nuclear weapons and long-range missiles. It would do so by giving the items what the bill calls “mass market status.” The items include such things as electronic devices used to trigger nuclear weapons, materials used to build missiles and produce nuclear weapon fuel, and high-speed computers used to design nuclear weapons and the missiles to deliver them.

1. Nuclear weapon triggers

For at least twenty years, the United States has controlled for export the high-precision electronic switches needed to detonate nuclear weapons. These are key components in a nuclear weapon’s firing circuit and are popularly known as nuclear weapon “triggers.” In 1998, Iraq tried to provide itself with a supply of these switches under the guise of medical equipment. Iraq is allowed to import medical equipment despite the U.N. embargo, so Iraq bought a half dozen machines – called “lithotripters” – to rid its citizens of kidney stones. The lithotripter pulverizes kidney stones inside the body – without surgery. But each machine must be triggered by the same high-precision switch that triggers a nuclear weapon. Iraq tried to buy 120 extra switches as “spare parts.”

Iraq ordered the machines and switches from Siemens, in Germany, which sold the machines but passed the “spare parts” order to Thomson in France. The French government barred the sale. Siemens says that Iraq did get one switch with each machine and two more as spares, but to get any additional switches, Iraq will have to turn in a used switch for each new one and will have to allow the United Nations to inspect the use of the machines. The switches were controlled for export because they are on the control list of the Nuclear Suppliers Group, an international regime to which France, Germany and the United States belong.

These switches, however, would have “mass market status” under S. 1712, and would be decontrolled for export by the United States. The switches meet all the criteria listed in Section 211 of the bill, and the bill says that the Secretary of Commerce shall remove them from the control list if they meet the criteria. They meet the criteria as follows:

They are “available for sale in a large volume to multiple purchasers,” because they are used in radar, lasers and rockets as well as lithotripter machines and are advertised on the Internet by manufacturers in a number of different countries;

They are “widely distributed through normal commercial channels,” because they are sold by the thousands each year, including the hundreds sent to hospitals to keep lithotripter machines running;

They are “conducive to shipment and delivery by generally accepted commercial means of transport,” because they are small and easy to handle;

They “may be used for their normal intended purpose without substantial and specialized service provided by the manufacturer,” because they need only to be connected into an electrical circuit by attaching the appropriate wires.

Any bill that decontrols nuclear weapon triggers must be seen as seriously flawed.

Despite the fact that these items are available in volume inside the countries that produce them, they are not easily available to countries that are trying to make nuclear weapons. The reason is export controls. If the United States were suddenly to decontrol them, it would dismay our allies and destroy our credibility on nuclear nonproliferation.

2. Glass and carbon fibers

Glass and carbon fibers are used widely in ballistic and cruise missiles. They go into solid rocket motor cases, interstages, wings, inlets, nozzles, heat shields, nosetips, structural members, and frames. Composites reinforced by carbon or glass fibers also form the high speed rotors of gas centrifuges used to enrich uranium for nuclear weapons.

In addition to these military applications, however, they are used in skis, tennis racquets, boats and golf clubs and are produced in a number of countries. This availability would give the fibers “mass market status” under the bill, despite the fact that they have been controlled for export since January 1981.

They are “available for sale in a large volume to multiple purchasers,” because they are advertised on the Internet and can be ordered in large quantities by anyone;

They are “widely distributed through normal commercial channels,” because they are shipped in large quantities to manufacturers of sporting goods;

They are “conducive to shipment and delivery by generally accepted commercial means of transport,” because they do not require special handling except for refrigeration in some cases;

They “may be used for their normal intended purpose without substantial and specialized service provided by the manufacturer,” because they can be incorporated in manufacturing processes in the form received.

In 1988, a California rocket scientist was arrested in Baltimore as he tried to illegally load 420 pounds of carbon fibers on a military transport plane bound for Cairo. The material was intended for the ballistic missile that Egypt was developing with Argentina and Iraq. The scientist was sentenced in June 1989 to 46 months in prison. It would be a big surprise to the world if the United States now decontrolled this material.

3. Maraging steel

Maraging steel is a high-strength steel used to make solid rocket motor cases, propellant tanks, and interstages for missiles. Like carbon fibers, it is used to make centrifuge rotors for enriching uranium for nuclear weapons. In 1986, a Pakistani-born Canadian businessman tried to smuggle 25 tons of this steel out of the United States to Pakistan’s nuclear weapon program. He was sentenced to prison as a result. Maraging steel has been controlled for export since January 1981.

This steel is produced by companies in France, Japan, Russia, Sweden, the United Kingdom and the United States and it meets all the criteria for “mass market status.” Several steel companies list maraging steel on the Internet and can produce maraging steel in multi-ton quantities. Over the telephone, two American companies and one British company explained to my staff how to order 25 ton quantities with delivery in less than a month. Maraging steel is bundled and shipped much like stainless steel, which it closely resembles.

4. Corrosion resistant valves

These special valves are essential components in plants that enrich uranium to nuclear weapon grade. Both Iraq and Iran are hoping to build such plants, and will need these valves in great numbers. The valves resist the corrosive gas used in the enrichment process.

These same valves are also used in the chemical, petrochemical, oil and gas, fossil power, pulp and paper, and cryogenic industries. Their size can range from very large gate valves down to tiny globe valves used in instrument and control lines. They are manufactured by companies in Australia, Japan, Russia, the United Kingdom and the United States. Smaller corrosion resistant valves have been controlled for export since October 1994, and larger valves have been controlled since October 1981.

These valves fit all of the criteria under Section 211 for “mass market status.” They are advertised on the Internet and are widely available to American buyers. A quick survey by my organization revealed that dozens of companies sell them in the hundreds per year. They would therefore be decontrolled under Section 211, to the great delight of Iraq and Iran.

5. High-performance computers

The bill would also decontrol high-performance computers as “mass-market” items. This would benefit nuclear weapon and missile designers across the world. High-performance computers can simulate the implosive shock wave that detonates a nuclear warhead, calculate the multiplication of neutrons in an explosive chain reaction and solve the equations that describe fusion in a hydrogen bomb. For missile design, these computers can model the thrust of a rocket, calculate the heat and pressure on a warhead entering the atmosphere and simulate virtually every other force affecting a missile from launch to impact. Because of the billions of computations needed to solve these problems, a supercomputer’s speed is invaluable for efficiently finding design solutions.

The United States has always used its highest-performance computers to design nuclear weapons. It is reasonable to expect other countries to do the same. In 1997, the head of Russia’s nuclear program, Mr. Viktor Mikhailov, bragged that Russia would begin using American high-performance computers to design nuclear weapons, after Russia had imported several machines illegally from IBM and Silicon Graphics. The new machines were about ten times more powerful than anything the Russians had previously.

China can be expected to do the same. In a study released in 1998, the Department of Energy found that for countries such as China or India to improve their nuclear weapon designs, they will need computers able to perform about 4 billion operations per second. That performance level is right in the middle of the range of computers that President Clinton just decontrolled. If S. 1712 were to become law, industry would demand that even more powerful computers be decontrolled on the ground that they are “mass market” items.

The Commerce Department has argued many times that one can buy powerful American computer chips and assemble them overseas in computers that are difficult to control. However, that argument ignores the important fact that high-speed computers require maintenance and spare parts. Who would build a manufacturing or research complex around a computer system that could not be reliably serviced? Foreign companies are still buying American high-performance computers to the exclusion of virtually all other makes. The reason is simple: American companies provide both reliable products and reliable service. There is still no evidence that foreign competitors can match it.

Foreign availability

Section 211 would also decontrol many sensitive items on the ground that they have “foreign availability status.” The definition of “foreign availability” in the bill is so sweeping that it covers virtually anything that a controlled country can buy from a rogue supplier. If Iran or Pakistan or Syria can buy a nuclear weapon component or a missile component or a piece of sensitive equipment from China, Russia or North Korea, then the bill would allow our industry to sell the same thing. Under the language of Section 211, even rocket motors would be decontrolled. North Korean rocket motors meet all of the bill’s criteria:

They are “available to controlled countries from sources outside the United States;”

They “can be acquired at a price that is not excessive;”

They are “available in sufficient quantity so that the requirement of a license or other authorization with respect to the export of such item is or would be ineffective.”

Today, Egypt, Iran, Syria and Pakistan are importing these rocket motors in “sufficient quantities” without any trouble. Requiring a U.S. license for their sale would obviously be “ineffective.” Thus, under the literal terms of the bill, they appear to have “foreign availability status.” One could argue that a rocket motor is a munition, rather than a “dual-use” item, but these motors can be used for civilian space launchers as well as missiles. Regardless of the classification, however, any definition of foreign availability broad enough to include North Korean rocket motors should be viewed with great suspicion.

American leadership on export controls

Many of the provisions of S. 1712 are based on the same principle that children use to excuse their misbehavior: “others are doing it.” Industry has managed to persuade the Banking Committee that if another country sells something, so should the United States. What would happen if this idea were actually put into practice?

First, we should remember the Scud missiles that Iraq launched against Israel during the Gulf War. Those missiles were supplied by Russia and their range was enhanced by Germany.

There were German logos on some of the missile parts found in Tel Aviv. Would our industry prefer to see American logos on those parts?

Second, we should remember that the same enhanced-range Scuds killed American troops sleeping in their barracks in Saudi Arabia. Would our industry be proud of having provided the parts that enhanced the range of those missiles?

Third, we should remember that Germany sold entire, turn-key poison gas plants to Libya and Iraq in the 1980s. These were “dual-use” facilities that Iraq said would make pesticides – but the plants turned out to be for “two-legged flies.” Would our companies be happier if they had supplied those plants?

Fourth, we should consider that China is now selling missile equipment to Pakistan and selling poison gas equipment to Iran. These items have “foreign availability” written all over them. Does our industry believe it should share in these sales? Are we unfairly excluding American companies from a lucrative market?

By tying U.S. law to that of other countries, U.S. export controls could be no stronger than those of the most lax foreign supplier. It would then be impossible for the United States to play its leadership role. We would be pegged at level of the lowest common offender. The effect would be to reverse a foreign policy stance the United States has maintained for over forty years. It would be an historic abandonment of America's moral leadership.

It is essential for the United States to be able to adopt strong controls first, and then persuade other countries to follow its example. This is the method by which every export control agreement since World War II has been created. U.S. diplomats are using this strategy today to help create export controls in the former East Bloc.

Congress should give the President broad authority to control the export of any dual-use item that is judged relevant to the national security of the United States. National security should be taken to include combating the proliferation of weapons of mass destruction and maintaining the military advantage that the United States now enjoys. The President should not be limited to controlling only what other countries control.

The power of the national security agencies

Under Section 202 of this bill, the Secretary of Defense would lose his existing power to put an item on the National Security Control List. Only the Secretary of Commerce would have that power. The Secretary of Defense has the right to be consulted, but that right could only allow the Pentagon to keep an item off the list that the Commerce Department wants to put on it. Since Commerce has always wanted to reduce the number of items controlled, this is a meaningless concession.

Section 211 also allows the Secretary of Commerce to take an item off the list after consulting with the Secretary of Defense, but does not allow the Secretary of Defense to prevent an item from being deleted.

The effect of these provisions is to give the Commerce Department sole power to decide what is controlled for export and what is not. The Secretary of Commerce could – and no doubt would – rewrite the entire National Security Control List without any real restraint by the national security agencies. This is the exact reverse of what the process should be.

The Defense, Energy and State Departments house the experts who understand how dual-use equipment operates and what the risks are if such equipment is diverted for military purposes. They also know which countries and companies in the world are most likely to divert it. These experts are not at the Commerce Department. In order to bring the maximum amount of government expertise to bear upon export control decisions, the qualified personnel at the national security agencies must be able to decide what is controlled and who is allowed to buy it.

But this bill gives the Commerce Department more influence than any other agency. In addition to deciding what will be controlled, Commerce will chair the most important export control committees and will use its administrative preeminence to influence the outcome of licensing decisions.

I hope that this Committee will recall the testimony it received last June from Dr. Peter Leitner, who is a Senior Strategic Trade Advisor at the Department of Defense. Dr. Leitner explained how the influence of technical experts from the national security agencies has been diluted by making them subordinate to a committee of non-specialists chaired by the Department of Commerce.

Congress should ensure that no license application is approved unless all the national security agencies concur. It makes no sense to allow cases to be escalated to the political level where the judgments of national security experts can be reversed by political considerations. If a national security agency takes a stand in opposition to an export application at the expert level, the case should end there.

Instead of being like poor relatives invited to dinner, the national security agencies should be put at the head of the table. Each interagency committee should be chaired by a national security agency. There is no reason to give this function to the Commerce Department, which has the least expertise in the subject matter. And the power to decide what to put on the control list should also be given to the national security agencies. Either the State or the Defense Department should be given the lead in formulating the export control list, with help from the Department of Energy for nuclear items. If export control is going to be a strategic question, instead of a trade question, then the strategic experts should be put in charge of it. That is the only division of labor that makes sense.

The power of the President

S. 1712 effectively takes away the President's ability to keep controls in place. The bill provides that the Secretary of Commerce shall determine that an item has mass market or foreign availability status if the item meets the criteria in Section 211. The Secretary must then decontrol the item.

The only way to retain control is for the President to make a special finding within 30 days that exporting the item "would prove detrimental to the national security of the United States." That finding would be impossible to make unless the President could foresee which country would buy the decontrolled item and how the country would use it against the United States. No President can foresee that. And even if the President could foresee it, he could still not stop the export unless there were a "high probability" that foreign supply of the item could be cut off. Is there a "high probability" that North Korea can be persuaded to stop exporting rocket motors?

When one combines the "foreign availability" and "mass market" criteria in this bill, it is hard to see what would be left on the export control list.

These defects are not cured by Section 201(c), which allows controls on items that could "materially" contribute to the proliferation of weapons of mass destruction. This section, in fact, would appear to put the United States in violation of the Nuclear Nonproliferation Treaty. Article one of the treaty obliges the United States "not in any way" to assist a non-nuclear-weapon state in acquiring nuclear weapons. There is no "materiality" exception in the treaty. A series of U.S. exports, each of which standing alone would not be "material," would violate the treaty if the exports "in any way" assisted a nuclear weapon effort. The term "material" is so vague that the Commerce Department could interpret it quite broadly.

Dangerous buyers

This past January, President Clinton lowered export controls on high-performance computers. He plans to lower them again later this year. These actions are certain to allow foreign nuclear and missile makers access to American machines. To reduce the risk that American computers will help fuel nuclear and missile proliferation, the United States should publish a comprehensive list of dangerous buyers – in addition to the present list of risky countries. The list would consist of foreign firms known to be linked to nuclear weapon and missile development. The list would not function as a blacklist. It would only be a warning list. Before selling any such company a product that could contribute to the spread of weapons of mass destruction, an exporter would be required to obtain an export license. This would allow the government to turn down dangerous sales without impeding innocent ones, and enable American industry to keep its competitive edge without arming the world. There will always be

the buyer who smuggles, or uses a front company, but that buyer won't get the parts and service needed to keep a high-tech enterprise going.

The United States did publish a list of 150 dangerous buyers in India and Pakistan after the two countries tested nuclear weapons in 1998. But so far, our government has not published a comprehensive, worldwide list of such buyers. The U.S. warning list for China, for example, contains only six names. The government has claimed that a more extensive list would reveal intelligence sources and set off diplomatic conflicts. But it is well-known that hundreds of firms in China and Russia are active in nuclear, missile and military production. Their names are not secret. It is silly to pretend we don't know they exist. The computer industry, in fact, would welcome a list of dangerous buyers. Industry would prefer to spend its scarce marketing dollars on buyers that don't present problems.

As a first step in building a list, I have attached to my testimony the names of 50 firms that are well-known parts of China's nuclear, missile and military complex. They have been selected on the basis of reliable, unclassified information. I recommend that the Committee submit these names to the Department of State, and ask for an opinion on whether the names should be included on the published U.S. export warning list. If the State Department judges that these firms should be included, then the Committee should ask the Commerce Department to add the names to the "entity" list in Part 744 of the Export Administration Regulations. American firms should not unwittingly make sales that undermine American security.

**Appendix A to Testimony of Gary Milhollin before the Senate
Committee on Governmental Affairs, May 26, 2000**

22nd Construction and Installation Corporation (Yichang)
23rd Construction Corporation (Beijing)
Aviation Industries of China I and II (AVIC) (Beijing)
Beijing Institute of Aerodynamics (BIA) (Beijing)
Beijing Institute of Electromechanical Engineering (Beijing)
Beijing Institute of Electronic Systems Engineering (Beijing)
Beijing Institute of Nuclear Engineering (BINE) (Beijing)
Beijing Institute of Technology (BIT) (Beijing)
Beijing Research Institute of Uranium Geology (BRIUG) (Beijing)
Beijing University of Aeronautics and Astronautics (BUAA) (Beijing)
Beijing Wan Yuan Industry Corporation (BWYIC) (also known as the China Academy of Launch Vehicle Technology [CALT]) (Beijing)
Chengdu Aircraft Industrial Corporation (CAIC) (Chengdu)
China Aerospace International Holdings Ltd. (CASIL) (Hong Kong)
China Aerospace Machinery and Electronics Corporation (CAMEC) (Beijing)
China Aerospace Science and Technology Corporation (CASC) (Beijing)
China Chang Feng Mechanics and Electronics Technology Academy (Beijing)
China Great Wall Industries Corporation (CGWIC) (Beijing)
China Haiying Electro-Mechanical Technology Academy (Beijing)
China Hexi Chemistry and Machinery Company (Beijing)
China Nanchang Aircraft Manufacturing Company (Nanchang)
China National Aero-Technology Import-Export Corporation (CATIC) (Beijing)
China National Aero-Technology International Supply Corporation (CATIC Supply) (Nanchang)
China National Nuclear Corporation (CNNC) (Beijing)
China North Chemical Industries Corporation (NOCINCO) (Beijing)
China North Industries Corporation (NORINCO) (Beijing)
China North Opto-electro Industries Corporation (OEC) (Beijing)
China Nuclear Energy Industry Corporation (CNEIC) (Beijing)
China Precision Machinery Import-Export Corporation (CPMIEC) (Beijing)
China Sanjiang Space Group (Wuhan)
Chinese Academy of Sciences (CAS) (Beijing)
Commission on Science, Technology and Industry for National Defense (COSTIND)
East China Research Institute of Electronic Engineering (ECRIEE) (Hefei)
Harbin Engineering University (Harbin)
Harbin Institute of Technology (HIT) (Harbin)
Hua Xing Construction Company (HXCC) (Yizheng)
Hubei Red Star Chemical Institute (also known as Research Institute 42) (Xiangfan)
Nanjing University of Science and Technology (Nanjing)
National University of Defense Technology (NUDT) (Changsha)
Northwestern Polytechnical University (NPU) (Xian)
Nuclear Power Institute of China (NPIC) (Chengdu)
Research Institute 31 (Beijing)

Shaanxi Institute of Power Machinery (also known as Research Institute 41) (Shaanxi)
Shanghai Institute of Electromechanical Engineering (Shanghai)
Shanghai Power Equipment Research Institute (SPERI) (Shanghai)
Shanghai Xinfeng Chemical Engineering Research Institute (Shanghai)
Shanghai Xinli Research Institute of Power Equipment (Shanghai)
Shanxi Xingan Chemical Material Plant (Taiyuan)
Shenyang Aircraft Corporation (SAC) (Shenyang)
Shenyang Aircraft Research Institute (SARI) (Shenyang)
Xidian University (also known as the Xian University of Electronic Science and Technology) (Xian)