Deemed export control regulations affect the security, economic, and scientific leaderships of our nation. It is essential that we get the balance among them right.

Five years ago the University of Maryland instituted an export control compliance program. Every faculty proposal is processed for export control concerns and resulting decisions documented. Since January 2004, 30 seminars for 400 faculty and others have been held to assure that all are up-to-date on rules and regulations. The sessions cover ITAR, EAR, and OFAC regulations, conduct of research, and shipment of equipment abroad.

Through these reviews, university contracts and subcontracts with industry have been affected. For example, a graduate student from India was denied access in December 1999 to a NASA project on the global monitoring of tree heights by satellite. In another case, when our Deep Impact project in NASA (which has sent a projectile to collide with Comet Tempel 1 on July 4, 2005) required the disclosure of ITAR-controlled information, it took months to arrange limited access to information for the principal investigator, a University faculty member. A federally sponsored project required a meteorologist to send twelve pieces of equipment overseas to measure incoming ultraviolet radiation. Although none of the equipment ultimately required a license, it took 6 months and 90 hours of attorney and faculty clock-time to get that conclusion from BIS. These are expensive and not isolated events.

Recently, a dean was not allowed into “his” Computer Science lab because he is a foreign national. The problem was eventually resolved. However, when you consider that over 50% of the University engineering faculty plus the dean of engineering are foreign born and that 52% of the engineering graduate students are foreign nationals and 45% of the science graduate students plus the dean are foreign nationals, you begin to see the picture of what restrictions on use of equipment by foreign nationals could mean at the University of Maryland. And in 2001, 57% of the nation’s science and engineering
post-doctoral scholars were foreign born. This comes at a time when the drum beat of challenge to the U.S. science and technology leadership is louder by the day. Bill Gates’ in remarks recently aired on NPR: “Morning Edition (April 29, 2005) predicts that with fewer students in math and science and a lack of national funding, the U.S. is destined to fall behind other countries in innovation. The fierce competition to keep up with technological changes has led Microsoft to open research offices in China and India.” Our nation’s dependence on foreign scientists and engineers must be given high priority when deemed export control license requirements are proposed.

Of course we know that compromise is necessary for purposes of national security. We must be prepared to sacrifice U.S. innovation going forward to preserve security. We must also slow, as needed for security, U.S. competitiveness as well as our national research and technology strengths. The question remains, however, is it necessary? We don’t want to sacrifice our security in the name of security.

I find myself deeply concerned with this question: Is all this necessary? It remains difficult for me to see that it is.

Specific concerns are as follows:

1. What is the real problem and what are the real costs of deemed export licensing?

   I have not been able to identify a national security problem that justifies potentially draconian restrictions proposed to fix it. I do not have one example in mind of a graduate student who has undermined national security through operation of a sensitive piece of equipment, let alone the scale of violations that would raise the threat to such a level that we would risk suppressing our technology future to try to suppress it.

   While some believe that the number of university licenses for use of controlled equipment will be few, there is nothing in the recommendations that guarantees it. The Commerce Control List has been around for decades and it has grown steadily, possibly because a decision to take technology off the list is more risky than to leave it on. We should expect an identical process in deemed export licenses. If the principle of deemed export licensing is to be expanded to include equipment use technology, the number and span of licenses will increase steadily.

   Even though the IG report has proposed that “operation of export control equipment” will require a deemed export license for some foreign nationals, it has been offered that not all operation of the equipment may require a license. Some uses may not require a license if the information garnered by the user is already in the public domain. This would vary with each piece of equipment, with each foreign user from a particular country and it would likely vary with time as well. How will institutions that want to avoid violation of deemed export regulations cope with vagaries of this policy? Of course they cannot. Fear of draconian sanctions from these vague policies and untested limits will most likely cause counsels to recommend a highly cautious approach on
unlicensed access to use by foreign nationals. Subcontracts to universities from industry will also be cautious thereby limiting use of export-controlled equipment by foreign nationals. The mantra will be “when in doubt, get a license.” And that will be most of the time.

We need a risk analysis that looks at the real threats and the real costs to government laboratories, industry and the nation’s universities of extending licensing requirements to equipment use before ratcheting up controls on “use” of controlled equipment.

2. **What is the outcome of compliance with deemed export licenses?**

The administrative burden can be stunning. On the federal side there will be the burden of licensing and updating lists of controlled equipment to reflect the new technologies that are being identified virtually weekly in *Science, Nature* and professional journals and of deleting old technologies that do not warrant retention on the control list. The expertise and work required to maintain an accurate control list and address the multitude of license issues could be nearly incomprehensible. The federal laboratories have hundreds of foreign postdocs working with and around state of the art equipment, as do commercial enterprises and the 3,500 U.S. universities and colleges and technical training facilities. It is reasonable to question whether such a system could ever work well (that is, without either bringing the work to a halt or more likely suppressing international participation in the U.S. research enterprise.)

The administrative burden for universities is also a large problem, although neither a new one nor the greatest one. The greatest problems for universities are (1) the disruption of the research programs and (2) the ultimate loss of access to the international scholar talent pool. Universities cannot run research programs where a two-to-three month delay is necessary because of requirements (a) to categorize each piece of equipment under the EAR, (b) to identify the nationality of each user of each piece of equipment, (c) to evaluate the extent of foreign national “use” of each piece of equipment (Is a license required?) and (d) to obtain a license for individual foreign nationals to make particular uses of individual pieces of equipment. This assessment could happen more than once during the course of one person’s doctorate or post-doc because of the dynamism of the lists and the course of research. This type of interruption should be a problem for federal labs too where international scholars are involved.

For a brief taste of the problem let me take on two everyday stories. Annually, the University of Maryland recognizes the most promising invention disclosures filed on campus. Over the past five years, half of all invention disclosures have been submitted by non-citizens and 70% of the finalists for the grand prize “Invention Disclosure of the Year” have been non U.S. citizens. For another anecdote on April 24, 2005, the Raleigh *News & Observer* ran a story titled “Duke lab unlocks a secret of drug-resistant depression” which describes how a renowned neuroscience lab uncovered why antidepressants fail to help some people. The team is led by a naturalized citizen and includes four postdocs, one Chinese, two Russians and a Canadian. So what is the lost
opportunity cost to our nation by disrupting teams and contributions like these? You might be asking, why tell such mundane stories like these? That’s exactly the point. They are indeed common; stories like these are legion. There are over 24,000 international postdocs in this country.

3. **Is it possible that the Inspector General’s recommendation in the March 2004 report to Congress on export controls is based on an incorrect premise?**

   The risk to our national security from international students/scholars who have been cleared through the visa/visa mantis procedures is not obvious. What is clear is that the high cost to universities, federal labs, and the private sector of implementing a licensing program for, as yet, undefined uses of equipment appears unnecessarily onerous. The cost to the U.S. research enterprise, which is already under enormous pressure because of diminished funding, is potentially very high especially when denying a visa to an undesirable foreign national and classifying technology to maintain secrecy seems like obvious, cost-effective and thoroughly tested solutions. There seems to be a lack of appreciation of just how vulnerable the U.S. research enterprise is to foreign competition and to its export overseas.

   Nationally the international student application numbers were down 28% last year with an additional drop of 5% this year. International applications at the University of Maryland were down 37% last year and another 5% this year. In five years, about 90% all scientists and engineers in the world will graduate in Asia. We are not the only game in town anymore. We need to recognize the cost of imposing barriers to our competitive position. This is especially true when many corporations do not advise customers of the export control classification of their products and do not inquire as to the nationality of purchasers/users of their equipment from sources other than universities.

**RECOMMENDATIONS:**

1. Greatly narrow the list/scope of controlled technologies requiring deemed export licenses and ensure the list remains narrow going forward.

2. Delete all controlled technology from the list whose manuals are available in the public domain, in libraries, over the Internet, or from the manufacturer.

3. Delete all equipment that is available for purchase on the open market overseas from foreign or U.S. companies.

4. Clear international students and post docs for access to controlled equipment when their visas are issued (or shortly thereafter) so that their admission to university academic programs is coupled with their access to use of export-controlled equipment.
5. Don’t change the current system of license requirements for use of export-controlled equipment in university basic research until the above recommendations have been implemented.

References:


*Science and Engineering Indicators 2004* (NSB 04-01) (May 2004).


*Survey of Foreign Student and Scholar Enrollment and Visa Trends for Fall 2004* (Council of Graduate Schools) (November 2004)