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Bureau of Industry and Security
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Re: Revision and Clarification of Deemed Export Related Regulatory Requirements
Bureau of Industry and Security, Commerce, 15 CFR Parts 734 and 772
(RIN 0694-AD29)

The Association of American Universities (AAU), which represents 60 leading U.S. research universities, appreciates the opportunity to comment on the Advance Notice of Proposed Rulemaking for “Revision and Clarification of Deemed Export Control Regulatory Requirements” and, specifically, the recommendations made by the Commerce Department’s Office of the Inspector General (OIG) in its report entitled “Deemed Export Controls May Not Stop the Transfer of Sensitive Technologies to Foreign Nationals in the U.S.” (Final Inspection Report No. IPE-16176-March 2004).

In addition to AAU’s comments, we are aware that several of our member institutions have submitted their own individual comments in response to the advance notice of proposed rulemaking, as have other higher education associations and scientific societies. These include the Council on Governmental Relations, The National Association of State Universities and Land Grant Colleges, the American Council on Education, the American Association of Medical Colleges, and the National Academies. We share their concerns and associate ourselves with their statements.

The global events of recent years and the evolving threats to the United States present new security challenges and requires a careful reassessment of our nation’s vulnerabilities. AAU universities share a special responsibility to ensure that research conducted under their auspices contributes to U.S. national security. However, American national security also includes our economic vitality, capacity for cutting-edge technological innovation, industrial competitiveness, and the global leadership in research and education that underpin the entire enterprise. Security also requires that the United States government not place well-intentioned but ill-conceived and unworkable restrictions
on university fundamental research and education that may damage our national security and economy far more than the risks they seek to mitigate.

As described in the sections below, the adoption and implementation of the OIG’s recommendations may seriously undermine the vitality of American research. American human capital alone, while extraordinary, has never been sufficient to meet compelling national needs for research, innovation, and competitiveness. This remains the case across the increasing range of disciplines and applications critical to American security and leadership today and will in the future. Yet the OIG’s recommendations would compromise the unique institutional culture of openness and competitiveness that makes our leading public and private universities the destinations of choice for many of the world’s leading intellects. The adverse consequences of these recommendations, however unintended, would occur at exactly the historical juncture when all experts agree that we are dependent on our continuing ability to attract to our laboratories and classrooms the best minds from around the globe.¹

The OIG’s recommendations would also impose significant new costs and administrative burdens at a time of severe budgetary constraints for both the government and universities. The intensity, pace, and productivity of university research and education programs would be compromised in the very fields of science and engineering that are essential to our global leadership and technological superiority. Indeed, it is likely that any security benefits derived would be very limited at best and would be achieved at an unacceptably high cost to broader national security and economic interests.

**AAU is committed to ensuring compliance with export control laws and to preserving national security.** Its Export Control Task Force, led by presidents and chancellors of its member institutions, welcomes the opportunity to continue working constructively and cooperatively with the Commerce Department’s Bureau of Industry and Security (BIS) to protect legitimate national security interests associated with university research.

AAU member institutions understand and accept the important national security imperatives that form the basis for export controls as a component of national security policy. They are committed to complying with applicable export control rules and regulations; indeed they have enhanced their compliance efforts in recent years. Earlier this year an informal survey of AAU senior research officers revealed that over the last two years, nearly all AAU institutions have taken additional steps to ensure their compliance with existing export control regulations. Steps already taken include: (1) issuing policy statements from the university administration concerning compliance with the export control laws; (2) incorporating training on export controls into standard educational materials provided to campus research administrators and sponsored research.

¹ The importance of international talent to the U.S. leadership in science and engineering research is highlighted by the National Academy of Science’s Committee on Science, Engineering and Public Policy (COSEPUP) in its report *Policy Implications of International Graduate Students and Postdoctoral Scholars in the United States*, May 10, 2005. For a further discussion of the potential adverse impact of export controls on innovation and national security, see: David R. Oliver, Jr., “Current Export Policies: Trick or Treat?” *Defense Horizons*, December 2001. See; [http://www.ndu.edu/inss/DefHor/DH6/DH06.htm](http://www.ndu.edu/inss/DefHor/DH6/DH06.htm).
directors; (3) undertaking a wide range of outreach activities on campus to ensure that faculty and key researchers understand the nature of export controls and are more aware of their responsibilities; (4) sending university staff to export control seminars and panel discussions; (5) designating specific research administrative staff responsible for export control compliance; and (6) hiring outside legal counsel to ensure compliance. These steps and others are intended to create a culture of compliance across university campuses.

In accordance with the BIS request, our comments in the next section provide the specific effects that the OIG proposal will have on academic institutions and university research if instituted without change. The first part of the next section summarizes some key contextual facts that are essential for understanding the adverse impact of the OIG’s recommendations. The second part of this section sets forth the specific consequences that the “deemed export” recommendations would have on AAU member institutions and their research. The second section suggests a series of alternative actions that would address the concerns raised by the OIG in ways that protect both legitimate national security interests and the vitality of university-based research.


A. Understanding the Context – Background and Data

To assess the adverse impact of the recommendations on AAU research universities, it is critical to provide the context in which they would be implemented. This section highlights five important realities.

1. American research universities provide an essential foundation for American security and contribute in multiple ways to promoting and protecting vital U.S. national security interests, including economic competitiveness and global leadership.

The fundamental goal of the American research university—both AAU and non-AAU—is to create new knowledge and educate the next generation of domestic and international leaders. Together, AAU’s research universities constitute an exceptional national resource, conducting nearly 60 percent of all federally sponsored university-based research and awarding approximately 17 percent of all bachelors degrees, 20 percent of masters degrees and over 50 percent of all doctoral and postdoctoral degrees, many of which are in key science and engineering fields. Taken together, our nation’s research universities contribute uniquely to the protection and advancement of American national security and economic interests while also enabling freedom and progress around the globe:

- America’s research universities are at the forefront of innovation; they perform over one-half of the nation’s basic research.
• The expert knowledge generated in AAU research universities is renowned worldwide; this expertise is being applied to advance and protect real-world American national security and economic interests every day.

• The scientific knowledge and technological innovation spawned by America’s leading research universities directly enhance U.S. economic competitiveness and U.S. national security.

• By combining cutting-edge research with graduate and undergraduate education, American research universities also are training the new generations of leaders in all fields that are vital to our national interests.

• American universities have long had the unique ability to attract the greatest minds from around the world, contributing to both our international leadership in innovation and our national security.

Past Presidential Administrations recognized the need to support fundamental research even in the face of serious threats to our national security. At the height of the Cold War, President Ronald Reagan placed a strong emphasis on U.S. national security – but his administration wisely determined that U.S. policies should ensure that, “to the maximum extent possible, the products of fundamental research remain unrestricted.”

In the face of unprecedented global competition and unprecedented threats to our security and our leadership, we simply had to out-think, outwork, and outrun our competitors and adversaries. In promulgating National Security Decision Directive (NSDD) 189, President Reagan recognized that national security was best served by making the classification process the sole means of imposing limitations on research. Many of the most dramatic contributions to American economic competitiveness, technological development and scientific leadership that, in turn, advanced national security, occurred in the years following the promulgation of NSDD 189, when a strong, bipartisan consensus existed for supporting fundamental research as an essential prerequisite for U.S. national security.

The proposed reinterpretations and the expansive scope of covered and controlled “use” technologies in the context of fundamental research would seriously undermine American research efforts to enhance our national defense and protect our national security. These proposals would have a chilling effect on areas of rapidly emerging U.S. research leadership critical to national security such as biotechnology, robotics, advanced processing technologies, materials science, nanotechnology, and laser research and

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2 National Security Decision Directive 189, September 21, 1985, defined fundamental research and noted that “It is the policy of this Administration that, to the maximum extent possible, the products of fundamental research remain unrestricted. It is also the policy of this Administration that, where national security requires control, the mechanism for control of information generated during federally funded fundamental research in science, technology and engineering at colleges, universities and laboratories is classification....” President Reagan found that while there was a significant transfer of U.S. technology to the Soviet Union, “universities and open scientific communication of fundamental research” made only “minor” contributions to such technology transfers.
applied physics. Each is increasingly global in scope. The best way for the United States to retain its leadership role and advance broader American security interests is to encourage dynamic, cutting-edge research at American research universities, reserving security controls only for those specific instances where clear and specific national security threats have been identified and where classification is appropriate.

2. Research equipment, tools, and materials – and the use of controlled “use” technology – increasingly are an integral part of fundamental research and cannot be considered as distinct and severable elements in that process.

Fundamental research in science and engineering today results from teams of individuals coming together from different scientific backgrounds and knowledge bases, a fusion of philosophical or conceptual ideas, and the integration of new and improved research tools and equipment. Put simply, at the core of the nation’s academic research and education enterprise are “people, ideas and tools.”

Increasingly, the most important fundamental research, in areas such as biotechnology, electrical engineering and applied physics and nanotechnology, relies on the development, use, operation and understanding of new research equipment and tools. As science extends its reach, new tools and instruments become increasingly important components of fundamental research.

The OIG’s report and recommendations do not reflect the changing nature of fundamental research today, including the growing trend toward multidisciplinary approaches and research strategies that rely on new equipment, tools, measurements, processes, and the technologies that enable them. The report adopts a false starting point in assuming that fundamental research primarily involves conceptual “Eureka” moments at the blackboard or on the computer, and that “use” technologies related to the equipment and other platforms or tools used in fundamental research can be separated from the rest of the inquiry without seriously affecting the entire fundamental research process.

The OIG report also fails to recognize the degree to which equipment is actually modified, enhanced, and even fabricated from scratch in university laboratories to advance fundamental research. Indeed, these equipment adaptations occur daily on our campuses as a part of the research process itself. This equipment is an essential component of, and inseparable from, fundamental research.

3. Foreign students and scholars are integral to what makes university research so dynamic. They represent more than a desirable supplement to American research; they are a core element that drives the dynamism and excellence of the American research enterprise.

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5 The integral role that research tools and equipment play in the research process is illustrated by the National Science Foundation (NSF), which has at the heart its mission the support of fundamental scientific research and science education. NSF uses “people, ideas and tools” to guide and define its long-term strategic goals for the purpose of the Government Performance and Results Act (GPRA).
At one large public AAU university, 50 percent of the engineering faculty and the dean of engineering are foreign-born, 52 percent of the engineering graduate students are foreign nationals, and 45 percent of the science graduate students are foreign nationals. This example – which echoes the experience at most research institutions around the country – begins to suggest the potential impact of tightened restrictions on technology transfers related to controlled “use” equipment by foreign-born students and scholars at American universities.

The National Science Foundation reports that for fall 2002, about one-third of the 455,355 graduate students enrolled in science and engineering fields in the United States – 145,112 students – were temporary visa holders. More recent 2004 data provided by the Institute of International Education (IIE) suggests that in 2004, there were 95,183 foreign students (undergraduate and graduate) enrolled in engineering, 67,736 enrolled in mathematics and computer sciences, and 44,605 enrolled in the physical and life sciences. Only business and management exceeded engineering, mathematics, and computer sciences in the number of foreign student enrollments.

Most international scholars and researchers in the United States also work in scientific and engineering fields. IIE found that during the 2003/04 academic year, more than 70 percent of the foreign scholars in the United States specialized in life, biological and health sciences, or in the physical sciences, engineering and computer and information sciences. More than 75 percent of foreign scholars overall, in both scientific and non-scientific fields, listed research as their primary function.

Over the years, the global talent pool of the best and brightest students and researchers in science and engineering has shifted. Today, 57 percent of all international students at American universities are from Asia. India is the leading country of origin for international students in the U.S (79,736) followed by China (61,765). The reality is that the largest fraction of the best and brightest students that America’s research universities attract comes from what the Department refers to as “countries of concern,” especially China, India, Russia, Pakistan and Israel.

According to the recently released National Academy of Sciences Committee on Science, Engineering and Public Policy (COSEPUP) report, Policy Implications of International Graduate Students and Postdoctoral Scholars in the United States, from

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1985-2001, students from such nations as China, India and Pakistan earned more than half of the 148,000 U.S. science and engineering doctoral degrees awarded – four times the number granted to students from Europe. In 2003, over 2,500 Chinese foreign nationals received a science or engineering PhD from a U.S. university. More than 800 scholars who were Indian foreign nationals received a PhD degree in science or engineering from a U.S. university.⁹ The COSEPUP report cites data from the 2003 National Science Foundation (NSF) Survey of Earned Doctorates, which presents and analyzes the most recent trends in the awarding of doctorates in the science and engineering fields. According to the NSF survey, of the 10,585 total doctoral degrees awarded to non-U.S. citizens with temporary visas in 2003, 8,388 were awarded in science and engineering. Among those awarded doctoral degrees in all fields, 2,241 were from China and 1,484 were from such West Asian countries as Iran, Israel, and Lebanon.¹⁰

As a result, a large fraction of the students and scholarly researchers most likely to need access to controlled “use” technology on the Commerce Control List at an AAU research university are not U.S. citizens and are not eligible to become U.S. “green card” holders. And many, perhaps a majority, of them come from countries that would require licenses. However, many, if not most, of these international students and scholars will end up staying in the U.S., where they will enhance our economic and national security. This reality significantly exceeds what is a slight risk of a “deemed export” transferring seriously important technology to another country. Adoption of the OIG recommendations may lead to the undesirable situation in which export control concerns, not scientific and engineering expertise and excellence, increasingly drive decisions to assign researchers to specific projects, to accept or reject new research proposals (including many that are critical to U.S. national security), or to participate in leadership roles in international science or technology collaborations.

4. The essential nature of fundamental research on AAU university campuses differs significantly from fundamental research at corporations or national laboratories. These differences are important in understanding the breadth and depth of the adverse impacts that the OIG’s recommendations would have on cutting-edge university research.

In many respects, it is the very openness of university campuses, the wide range of research facilities and equipment, the cross-fertilization of bright minds and analytical strategies, and the novel approaches to questions and problems without boundaries that make possible the exceptional contributions of academic research to national security and other national priorities. Unlike a corporation or a federal laboratory that can and does segregate facilities, require badges, or restrict the participation of foreign nationals,


research universities traditionally have gone to great lengths to avoid such measures for unclassified information and research because they would fundamentally change the nature and character of universities. The close coupling of research and education at universities, and the need to pursue unimpeded the new ideas that flow from scholarly discourse, require that access to laboratories and classrooms be unimpeded. Unlike the corporate or national laboratory environment, students play a vital role in the conduct of university based research. In many instances, their tenure working in a particular laboratory is directly tied to the school term or semester. The constant rotation of students and visiting scholars into and out of university laboratories ensures a fresh flow of new ideas and talent which helps to foster creative, cutting edge research results. This marriage between research and education is the key to our successful creation of new knowledge and innovation.

The diversity of conceptual approaches and new ideas at universities is matched by the diversity in the physical research facilities at AAU member institutions. Most have hundreds – in some cases, thousands – of decentralized laboratories spread across their campuses. Many of them would require new security plans, access procedures, and tracking requirements to prevent students and researchers who are not U.S. citizens or who do not have valid export licenses from having access to certain laboratories because of controlled “use” equipment. As research increasingly spans disciplinary boundaries, students and researchers unexpectedly find themselves needing to use different facilities or pieces of equipment in unanticipated ways. These developments occur during the process of discovery, problem definition, testing, and problem solving. To stop this process and seek a license would greatly undermine the great benefits of interdisciplinary research. It would also impede the education mission of our nation’s top research universities.

As fundamental research becomes increasingly global in scope, the U.S. risks isolating itself from scholarly discourse and undermining its academic leadership if the OIG’s recommendations are adopted and implemented. Many AAU institutions, for example, abide by strict prohibitions established by their boards or corporations or, in a few cases, by state law, against discriminating on campus among students or researchers based on national origins or restricting the openness of their on-campus facilities for unclassified fundamental research. Some AAU universities already have decided to decline important research or federal funding because of export control restrictions or other controls that would require them to contravene long-standing core values and policies. The OIG’s recommendations likely would multiply those occurrences.

5. The OIG’s recommendation for requiring separate licensing controls on equipment “use” technology involved with fundamental research in universities would likely result in significant new administrative burdens, increased costs, liability risks, regulatory uncertainty and unintended consequences that would retard or interfere with university research and education and undermine broader national security objectives
The AAU Task Force has consulted extensively with a broad range of leading scientific and engineering faculty in a number of the fields that appear most likely to be affected by the OIG’s recommendations. We also have reviewed the Commerce Control List (CCL) to identify specific groups of equipment for which “use” controls currently exist and for which licenses likely would be required. This process has been very time-consuming; due to the complexities and imprecise definitions involved, and the lack of clarity surrounding controlled “use” technology, solid data has been very difficult to collect from our institutions. Many have, however, estimated the costs of conducting a complete campus-wide inventory of research equipment to run in the millions of dollars (estimates range from $1.5 million to $5 million, depending upon the number of pieces of equipment that exist on a campus and whether the work is done in-house or contracted to outside firms).

While licenses might not, in fact, be required for a majority of these pieces of equipment (depending on both the manner in which they are being used and who is using them), it is understood that comprehensive inventories of research equipment would be required at all universities to ensure compliance, should the OIG interpretation of existing regulations be accepted. Our institutions have not conducted such extensive inventories in the past because interpretations of the regulations and accompanying Q&A’s as they are currently written have never suggested that research equipment and its use are not covered by the existing fundamental research exception as provided for in the Export Administration Regulations. We believe strongly that a change in this interpretation would be detrimental to our ability to conduct fundamental research on our campuses.

To try to fulfill the DOC’s request for data, AAU has identified a range of equipment and tools widely used in fundamental research on many university campuses that clearly do involve “use” technologies subject to controls. Several examples, by field of research, illustrate how onerous the “deemed export” licensing requirements would be if the OIG recommendations were adopted and implemented and how these delays and burdens would likely adversely affect research essential to a number of national priorities. Indeed, whole fields of science – such as nanotechnology – have the potential to be affected by the OIG requirements. And finally, there are likely to be significant other costs and unintended consequences if the OIG recommendations are accepted.

Examples

While far from being all-inclusive, a list of examples of other equipment often used in university laboratories for which use technology controls may exist include materials processing equipment (2E002); biological equipment (2B352); applied physics/ee equipment (1E101); and sensors and high-end oscilloscopes (1E101). Again, this list serves as only a small sampling of the equipment to which international students currently have access in university labs. However, it does illustrate the enormity of the task that Commerce is asking universities to undertake. Universities will not only be forced to conduct a complete inventory of all equipment in their laboratories for which controls might exist but also have to study carefully how it is being used and the
citizenship and birthplace of students and scholars with access to this equipment. This presents a major and almost insurmountable burden. Moreover, it raises questions concerning the ability of new students to be brought into laboratories to conduct research without incurring significant delays before they can actually utilize equipment.

In addition to the examples above, hundreds of other pieces of widely used equipment on university campuses are subject to technology “use” controls under “Anti-Terrorism” (AT) controls (e.g. ECCN 3A992 controls “General purpose electronic equipment not controlled by 3A002” including “a. electronic test equipment n.e.s. [not elsewhere specified]”). This controlled “use” technology would require licenses for students and researchers from a much more limited number of countries; therefore, the number affected on each campus likely would be relatively small. Nevertheless, the compliance burden for this equipment would be very high because universities still would need to undertake the full range of due diligence for every research project on campus and evaluate every technology, item and piece of software on campus to determine if it is subject to “use” controls. This would require: classifying all these items for export control purposes; implementing new security plans and precautions to ensure that foreign nationals from countries subject to AT controls cannot have access to any controlled “use” technology without a license; and developing the extensive range of technical and background licenses required if a “deemed export” license application is required.

Nanotechnology

The National Nanotechnology Initiative (NNI) is a multi-agency U.S. government program aimed at accelerating the discovery, development, and deployment of nanoscale science, engineering, and technology. It is based on a vision that our ability to understand and control matter at the nanoscale level can lead to a revolution in technology and industry – and provide numerous societal benefits. The President’s NNI Strategic Plan establishes an interrelated set of goals that include the maintenance of world-class research and development in the United States and the facilitation of technology transfers related to nanotechnology. The President’s Council of Advisors on Science and Technology (PCAST) recently evaluated the NNI for the President. Its assessment emphasized the central role that fundamental research at American universities plays in achieving these national objectives and in promoting American competitiveness for the future.

CCL Category 1E controls technology associated with products classified under 1C of the Commerce Control List. An area of growing research interest is fundamental research related to carbon nanotubes. Transfers of technology related to equipment and tools used in fundamental research related to carbon nanotubes subject to ECCN 1C010.b are restricted under ECCN 1E001. This technology is controlled under National Security controls (NS1), Nonproliferation controls (NP1), and Anti-Terrorism controls (AT). As a result, if the OIG recommendations were adopted, students or researchers from countries such as China, India, Russia, and Israel would require a license before they could use any equipment where controlled technology might be transferred to them, even though the “use” technology constitutes an integral part of the fundamental research on carbon nanotubes that otherwise is outside the scope of the Export Administration’s Regulations. The burgeoning field of carbon nanotubes alone would require a significant number of
deemed export license applications for current and future fundamental research to move forward. Other important research areas in nanotechnology—such as fundamental research involving equipment and technology related to “Carbon fibers and filamentary materials; composite structures; platinized catalysts” (ECCN 1E201)—also would be affected.

Other Costs and Unintended Consequences

Because the CCL is so extensive, the regulations pertaining to “use” technology are so unclear, and the penalties for non-compliance are so severe, it is likely that universities will be forced to over-classify equipment on their campuses or seek licenses for all their international science and engineering students and scholars. Indeed, even if the total number of licenses required on campuses proves to be limited, the process of classifying equipment to determine when and if export licenses are required is daunting. Such an outcome would prove burdensome not only to universities but also to BIS staff.

Given that in many instances researchers themselves will have to make determinations about such equipment if in fact licenses are required, there is an additional concern that the imposition of the OIG recommendations will adversely change faculty behavior. For example, in response to increasing restrictions on university-based space-related research imposed by the International Traffic in Arms Regulations (ITAR), one university faculty member has said that he has made a conscious decision to stop accepting foreign students on his research projects, no matter how bright or talented they might be. The researcher stated, “I just don’t have the time required to go through the cumbersome process of making sure that I understand the regulations and applying for licenses for these students.” Indeed similar behavior will result if the OIG recommendations are imposed, but the impact will be greater because they will be much more broadly applied, given the breadth of the CCL and the uncertainties surrounding what constitutes “use” technology.

In the biological disciplines, stricter security controls have recently been applied, and some researchers have abandoned these fields entirely to avoid the added burdens and costs of ensuring that they are in compliance with the myriad of complex regulations. In several instances, universities are being forced to consider building separate “off campus” facilities for such research in order to ensure that individuals without proper background checks and clearances do not have access to biological agents. Indeed, there is concern that some universities may be locked out of such research entirely due to the costs of compliance. If the OIG recommendations are adopted, it seems certain that researchers and institutions will be forced to make similar choices in other fields, even if the chances of a transfer of controlled “use” technology are relatively small. Establishing security controls and segregating specific laboratories

or portions of laboratories would result in soaring costs. Moreover, apart from the fiscal costs involved in such decisions, the segregation of certain sciences would prevent the cross-disciplinary collaborations that frequently result in the most exciting/worthwhile discoveries.

b. National Origin

The Inspector General’s report recommends using a foreign national’s country of birth as a criterion for deemed export license requirements in addition to country of most recent citizenship. As a way to collect and maintain information such as “country of birth” for students and scholars attending U.S. universities on F and J visas, the Department of Homeland Security uses the Student Exchange Visitors Information System (SEVIS) database. It is important to note that the information contained in the SEVIS database is accessible only to DHS-certified “designated school officials,” or “DSOs.” It is not readily accessible to other research administrators and laboratory directors – the very individuals most likely to be responsible for ensuring compliance with export control requirements. And for some non-immigrant visa categories not tracked by SEVIS (e.g. H-1B visas), information concerning country of birth is not maintained at all on our campuses.

AAU strongly believes it is the responsibility of the Departments of State and Homeland Security to perform the necessary background checks before providing a non-immigrant visa to a student or scholar. Given that all students and scholars participating in scientific or engineering research undergo personal interviews and many, especially those likely to have access to controlled “use” technology, undergo in-depth Visas Mantis clearances, we believe that it is not only unnecessary and duplicative but also unworkable for universities to be required to act as secondary “gatekeepers” by further scrutinizing a student’s intent or by imposing limitations on which non-classified research foreign nationals may participate in during their course of study in the U.S.

The decision about an individual’s intent must be made by government officials before the student or scholar is allowed to enter the country. Once a student or scholar is granted a visa to study in the U.S., he/she should be allowed to participate fully in the intended and cleared research program. This includes using required equipment to carry out such research. We note that a recommendation made by the Department of Homeland Security (DHS) OIG to superimpose deemed export controls upon the SEVIS system was rejected by DHS because of the complexity of making such a system work. The same complexities are guaranteed if the criterion for export license requirements becomes the country of birth. Moreover, the cost of implementation would be excessively high.

It should be noted that this proposed change in the evaluation of citizenship would, in cases in which the student’s country of birth is different from the current country of citizenship, greatly exacerbate the amount of work required by universities to determine which students need licenses for which uses involving which pieces of equipment. *A priori*, universities would have to assume that all international students
could require licenses until they were able to verify their place of birth. For a student born in one country and now a citizen of another country, universities would be required to evaluate both citizenships against the Commerce Control List and the Country Chart to make licensing determinations.

Beyond the serious questions about privacy and civil liberties that arise when the federal government makes a distinction based on national origin, strict judicial scrutiny applies because “national origin [is] so seldom relevant to achievement of any legitimate state interest that laws grounded in such considerations are deemed to reflect prejudice and antipathy.” Such laws must be aimed at achieving a compelling government interest and must be narrowly tailored, not overbroad, to achieve that interest (City of Cleburne v. Cleburne Living Center, 473 U.S. 432, 440 [1985]). While national security is certainly a compelling interest, any blanket policy premised on the assumption that all individuals who were born in a particular foreign country but who are no longer citizens of that country still hold some allegiance to that country is overly broad.

II. Proposed Solutions

AAU has appreciated the ability to work productively with BIS to explore the implications of the recommendations. We wish to continue working with BIS to provide strong national security protections while ensuring that America’s research universities maintain their global leadership and thus contribute to the vitality of American security – defense/homeland technological, and economic. AAU members urge consideration of the following recommendations and alternative solutions, which are designed to address national security concerns while avoiding the adverse impacts associated with the adoption of the OIG’s recommendations:

A. General Recommendations

1. **Reject the OIG interpretation that use of certain controlled equipment used in the conduct of fundamental research is not covered by the fundamental research exception and, therefore, may require deemed export licenses.**

Given the impossibility of distinguishing between “fundamental research” and the equipment, tools, materials, and technologies essential to and unseverable from its conduct—as discussed in section I.A.2. above—AAU urges rejection of the interpretation advanced by the OIG that technology relating to the use of controlled equipment—regardless of how “use” is defined—is subject to the deemed export control provision.

AAU fundamentally disagrees with the OIG’s interpretation and believes that it runs contrary to the intent of the fundamental research exception and to the intent of NSDD 189. AAU would urge that changes be made to existing regulations and interpretations as needed to make clear that the scope and conduct of fundamental research includes non-exclusive, non-proprietary access to the equipment, materials, technology and information necessary to conduct that research. If this recommendation
by AAU is accepted—and AAU urges that BIS give it serious consideration—all other recommendations below are moot and need not be considered.

2. **Students and scholars should be cleared to conduct research and use the equipment required for such research through the visa process.**

Over the past few years, AAU and other organizations have worked closely with federal agencies, including the U.S. Department of State and the Department of Homeland Security to improve the Visas Mantis system that screens foreign visitors planning to study or conduct research in certain areas before they are allowed to enter the U.S. Our discussions with these agencies have been very productive and have resulted, generally, in manageable systems with reduced delays. Such screening at the front end of the process—before foreign visitors enter the country—is an efficient and effective way to ensure national security.

AAU recommends that once cleared to enter through the Visas Mantis process, foreign visitors should be free to use equipment required for the conduct of fundamental, unclassified research without additional barriers, background checks, and/or licenses. AAU encourages the federal government to further improve visa and clearance processes to enable the full clearance of foreign students and scholars to conduct fundamental research at the time of visa issuance. If additional review is determined to be essential at the time a visa is granted to certain foreign students and scholars, a special license could be granted to enable them to conduct research involving specific export controlled equipment they are likely to need in pursuit of their fundamental research. Individuals who change their focus to a sensitive field of study could be addressed through the SEVIS reporting system and subsequently reviewed by the Department of Homeland Security.

3. **Additional clarification and a narrow definition of “use” technology are essential to ensure national security and enable effective compliance.**

BIS officials have repeatedly stated in their conversations with the AAU task force that the mere “use” of equipment in campus-based research laboratories is not an issue of concern to them. Their concern is the transfer of “use” technology. However, current regulations seem to contradict that position, suggesting that the “operation” of equipment is not only a concern but is, in fact, a defining characteristic of “use.” This makes it very difficult to determine the point at which someone is merely “using” equipment versus “operating” it in a way that use technology may be transferred.

On behalf of the people best positioned to ensure compliance, the laboratory directors and leading research faculty and experts, we would urge that definitions be made clear, concise, and workable. Faculty and campus-based researchers need to be provided with a level of clarity and detail that enables them to comply with “deemed” export controls regulations in a manner that does not obstruct or detract from their primary research, teaching, and education roles. It is the view of AAU that the ambiguity in the regulations would force personnel to seek numerous advisory opinions and
assistance from the Department of Commerce in interpreting the regulations on a case-by-case basis. This is clearly not workable and would result in an undue burden not only on university researchers and administrative staff but also upon BIS officials. In addition, contradictory language and lack of clarity undermine development of a positive, cooperative spirit of compliance among researchers.

AAU urges BIS to further clarify the language and definitions in the existing regulation and to establish a clear and narrow definition of “use” technology. AAU recommends that Commerce provide additional clarification concerning the specific nature of technologies and equipment usage that are, in fact, likely to require licenses and for which demonstrable security threats have been identified. This should include information concerning when, if ever, “operation” of specific equipment needed for fundamental research would likely trigger export licensing requirements. Moreover, licensing controls should be limited to those few technologies where (1) intelligence confirms a demonstrable need for restrictions and (2) the controls are carefully calibrated to focus only on those controlled “use” technologies that: (a) are “controllable” (i.e., proprietary and not readily available outside the United States); and (b) actually are likely to result in preventing deleterious technology transfers.

4. The OIG’s recommendation that country of birth should be used for purposes of export control in addition to most recent citizenship should be rejected.

AAU urges that the use of “country of birth” as a determining factor for requiring that a deemed export license be obtained for a student/scholar be rejected because it is overly broad. It also raises constitutional issues in assuming that an individual’s country of birth determines his or her allegiance to a nation. Moreover, this requirement would place a costly and time-consuming administrative burden on U.S. universities and laboratories. It is important also to recognize the impact these policies would have on our allies whose citizenry would be subjected to new scrutiny and could face restrictions based upon their birthplaces. Other nations might reciprocate. International researchers might respond out of solidarity with their colleagues through further boycotts of conferences in the U.S. or by taking their collaborations elsewhere. We would argue that these negative impacts come without any commensurate security benefit.

5. A more comprehensive review and study of the export controls as they relate to scientific research should be undertaken in the context of globalization and our current national and homeland security threats.

The federal government should conduct a comprehensive review and study of the export control rules that affect scientific research. Such a review should include such considerations as the context of globalization and current national and homeland security threats. It should examine whether or not the national security benefits of strict export controls on fundamental scientific research outweigh the costs of lost international students, scholars, and research programs. A study also should take into account whether or not efforts to limit access to fundamental U.S. technical and scientific knowledge in
limit our ability to gain access to key scientific advances being made in other countries.

AAU recommends that the National Academy of Science (NAS) undertake a major review of U.S. export control policy, including its potential impacts, both positive and negative, on continued U.S. leadership in science and technology. This study should be similar to that conducted in the early 1980’s by an NAS panel chaired by Dr. Dale R. Corson, *Scientific Communication and National Security*. This comprehensive review of science and security played a major role in the promulgation by the Reagan Administration of National Security Decision Directive 189, which established classification as the primary means to control sensitive research and information.

The initial groundwork for such an investigation has already been done by the Center for Strategic and International Studies (CSIS) Commission on Scientific Communication and National Security. In its June 9, 2005, white paper entitled, “Security Controls on Scientific Information and the Conduct of Scientific Research,” the Commission examined several forms of security controls on scientific research, including export controls. The Commission strongly reaffirmed the importance of the open conduct and dissemination of unclassified fundamental research and suggested that the best security controls for scientific research are likely to be produced by increased self-regulation by the scientific community. The CSIS Commission rejected outright the recommendations concerning deemed export controls made by the Commerce OIG on the grounds that they would be difficult to administer and could damage U.S. research, hinder important discoveries, and drive away research talent; all while yielding little if any security benefit. AAU endorses the findings of the CSIS commission as contained in the white paper, and feels that this work represents a good basis for a further exploration by an NAS panel.

6. *Continue to discuss how best to ensure our national security objectives while also protecting the research essential to our economic, national and homeland security.*

The discussion prompted by the OIG recommendations has been positive. It is important that federal agencies continue to work with the scientific and academic community to ensure that we protect national security while also preserving vital fundamental research and the open environment that enables major scientific advances.

AAU is pleased with the formation of a National Science and Technology Council (NSTC) Task Force to examine the potential impact of the OIG recommendations. AAU would suggest that this panel look beyond the impact the OIG recommendations would have on government laboratories to their potential impact on science and the broader scientific and academic communities.

We would also urge that an ongoing forum be established through which discussions could occur among the government, universities, and the broader research community concerning issues that pertain both to protecting information vital to national
security and to the free and open way in which research is most efficiently accomplished. A similar recommendation was made by the National Research Council in its 2002 report, *Making the Nation Safer: The Role of Science and Technology in Countering Terrorism* (pp. 370-371). We endorse the NRC recommendation and would urge OSTP and other federal security agencies to move to create such a forum.

**B. Recommendations for additional clarification to existing regulations and specific BIS Q&A’s**

In addition to the general recommendations contained above, AAU believes there are several areas in which the regulations could be clarified and further refined. Specific recommendations are listed below.

1. **Clarify the definition of “publicly available” technology**

   Much of the equipment used for fundamental research at universities is controlled for export abroad but is freely available on the commercial market to anyone in the United States. Moreover, many other countries do not operate under the same deemed export rules and therefore such equipment can be readily purchased, accessed and used in laboratories overseas.

   To provide additional clarity to the EAR regulations § 734.7(a)(1), AAU strongly recommends that Commerce define “publicly available information” as “technology which is not subject to the protections of corporate policies, non-disclosure agreements, or trade secrets, or which is not otherwise proprietary.” Along these same lines, user manuals for publicly available equipment and technology should not be controlled unless such manuals specifically contain “proprietary” information or information of a nature not ordinarily made available to the public or provided with the public sale of the equipment (e.g. manuals for the operation of and maintenance of a Boeing 747 Jetliner).

2. **“Modifications and enhancements to” and “fabrication of” equipment during or arising from the conduct of fundamental research should be exempt under the fundamental research exception.**

   Clarification should be provided such that “modifying,” “enhancing,” or “fabricating” equipment during the conduct of fundamental research is, in fact, covered by the fundamental research exception, so long as those changes involve no proprietary or classified information. As explained in point I.A.2., equipment is enhanced, modified, and created daily on our campuses as an integral part of the research process. For the purposes of deemed export controls, modification to and fabrication of research equipment should be treated as a part of fundamental research and exempt from deemed export control requirements.
3. Additional clarification is needed concerning when the “operation” of controlled equipment does, in fact, constitute “use” that requires a license.

The OIG’s proposed change from “and/or” to “or” would have significant consequences for universities. Virtually all university researchers “operate” equipment in the context of their fundamental research, and are trained in the safe and effective “operation” of that equipment. The definition of “use” should be modified to make clear that such operation is not subject to technology controls.

We have been told verbally by BIS officials that the mere “operation” of controlled equipment does not trigger export control requirements. This statement is contradicted by the plain language of “use,” which includes the notion of “operating.” By changing the “and/or” to “or,” the regulations themselves suggest that in every instance, “operation” would in fact represent “use” and therefore trigger export control requirements.

We would urge that a specific and narrow list be developed of equipment for which “operation” is of specific concern. If these pieces of equipment, or examples thereof, cannot be identified to specifically explain when mere “operation” of equipment would require a license, then we suggest the word “operate” be eliminated from the definition of “use.” Moreover, we urge that additional clarification be provided for when other elements of use such as “installation,” “maintenance,” “repair,” “overhaul,” or “refurbishing” are likely to result in a transfer of controlled use technology such that a license would be required.

III. Summary and Conclusion

The fundamental research undertaken at our nation’s research universities produces new knowledge as well as the educated scientists and engineers who are essential to our national economic competitiveness and national security. To ensure continued global scientific and technological leadership, American universities must be able to continue performing their research and education missions in an open environment, at the highest levels of achievement. To serve the nation, deemed export control policies must recognize the importance of and avoid doing unintentional damage to this open and unique environment.

AAU questions the fundamental premise of the Commerce OIG recommendations that equipment “used” in the conduct of fundamental research on university campuses should not be covered under the fundamental research exception. We believe that this notion is misguided and reflects a lack of understanding of how research and education are conducted in a campus environment. Moreover, it fails to recognize the inseparable nature of the tools used to conduct fundamental research and the research itself. We are concerned that, if implemented as proposed, the OIG recommendations would significantly damage university-based research and education – and actually harm our national and economic security – in an attempt to address unquantified and unidentified security risks.
AAU remains concerned that requiring even a modest number of deemed export licenses on every campus could seriously compromise the fundamental research environment and impose a disproportionate administrative burden on both universities and the Department of Commerce. We therefore urge BIS, at a minimum, to focus much more narrowly the scope of equipment for which “use” on university campuses is of concern and provide additional clarification concerning the specific nature of such technologies and usage. In particular, we urge that “use” technology be very tightly defined and applied in an academic research environment only when specific problems and/or security threats have been identified. Overly broad definitions of “use” and/or “operation” would lead only to confusion on our campuses and make compliance difficult if not impossible. Moreover, they would likely impose a substantial administrative burden on the Department of Commerce BIS. They would not enhance national security, but rather hinder it.

AAU welcomes the opportunity to continue to work with the Department of Commerce on these important national security issues.

Cordially,

Nils Hasselmo
President

Cc: Dr. John H. Marburger, III

NH/TLS/law