

Paper #1

**University Research Under Siege: How the War on Terror Has Placed
Academic Freedom Under Fire**

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I. Introduction

A U.S. District Court convicted a professor from the University of Texas who now faces up to 150 years in prison and \$1.5M in fines for working with a Chinese research student on a high-technology project. Prosecutors charged professor emeritus Dr. Reece Roth, highly renowned for his work in plasma research, for conspiring to violate the Arms Export Control Act.¹ Under the Act, Professor Roth violated federal law by permitting his American research assistant to share information with his Chinese research assistant.² The professor and his research assistants were working as subcontractors for a Tennessee technology company that was developing plasma technology for the U.S. Air Force. Interestingly, Dr. Roth had secured a patent for the technology used for the research prior to entering into the research contract with the company. Initially assigned to work separately, Dr. Roth gave permission to the two students to share information because of the complexity and difficulty of the project.

In wake of a 2007 report from the Deemed Export Advisory Committee (“Advisory Committee”), Dr. Roth’s conviction highlights critical problems within the current deemed export control policy of the United States. The report is highly critical of current export regulations, suggesting:

Viewed in the context of the evolving security and commercial environments of the post-Cold War 21st Century, the long established regulations that control deemed exports appear today to possess a number of shortcomings that range from the way the regulations are written and interpreted by the Government to the change in the very business and research environment to which the regulations are applied. The most prevalent of these shortcomings is that the current deemed

1. See Jamie Satterfield, *Retired UT Prof Guilty; Case Gained National Attention*, KNOXVILLE NEWS SENTINEL, September 3, 2008, available at <http://www.knoxnews.com/news/2008/sep/03/ex-ut-prof-guilty/>.

2. *Id.*

export regulations have become increasingly irrelevant in the prevailing globalized commercial, academic and national security environments.³

In fact, the Bureau of Industry and Science's ("BIS") interpretation and enforcement of the deemed export rule has been damaging to United States industry, research, and its competitiveness in the globalized world.⁴

The tragedy of September 11, 2001, the subsequent anthrax attacks, and the ongoing terror threats internationally have markedly changed national and international security. As concerns about threats and terrorist activities have become global, so have the rapid transfer of information and communication. The confluence of the globalization of business and the revolution in information storage and transmittal has changed the landscape upon which to build national and international security. This requires a re-examination of the security measures developed during the days of the Cold War to assess whether those tools are still appropriate and to determine how they are affecting the current science and technology enterprises.⁵ The prevailing globalized commercial, academic, and national security environments have left the

3. DEEMED EXPORT ADVISORY COMM., THE DEEMED EXPORT RULE IN THE ERA OF GLOBALIZATION (2007), *available at* <http://tac.bis.doc.gov/2007/deacreport.pdf>.

4. *See, e.g.*, DEEMED EXPORT ADVISORY COMM., THE DEEMED EXPORT RULE IN THE ERA OF GLOBALIZATION (2007), *available at* <http://tac.bis.doc.gov/2007/deacreport.pdf>; *see generally* Benjamin Findley, *Revisions to the United States Deemed-Export Regulations: Implications for Universities, University Research, and Foreign Faculty, Staff, and Students* 2006 WIS. L. REV. 1223 (2006) (reviewing the history of United States export controls and arguing that the proposed revisions to U.S. export regulations in March 2005 and May 2006 are contrary to established export policy and would adversely impact university fundamental research as well as national security.)

5. Nat'l Research Council, *Science and Security in a Post 9/11 World: A Report Based on Regional Discussions Between the Science and Security Communities* (2007), *available at* http://www.nap.edu/catalog.php?record_id=12013.

United States government “tilting at windmills.” The government can no longer afford to implement a Cold War-era deemed export regulatory regime.

This paper analyzes the proposed revisions to United States export regulations contained in the Deemed Export Advisory Committee’s 2007 report. While the Advisory Committee’s work was much needed and its recommendations laudable, this paper discusses the reasons why its recommendations must be narrowly tailored in order to preserve the competitiveness of U.S. businesses and universities in the globalizing world and to advance national security. Part II explains the regulations that govern U.S. exports, including the deemed export regulatory regime and how those rules implement a range of national obligations and interests. This Part also discusses the events that threatened to significantly burden the research process and establish strong disincentives to employ foreign students in critical university research, which led to the establishment of the Deemed Export Advisory Committee.

Part III discusses the findings, recommendations, and implementing actions of the Advisory Committee in specific detail, including its primary finding that the current deemed export rule does not reflect the realities of today’s national security needs or global economy. Part IV analyzes the implications of these revisions by examining the costs of compliance for U.S. universities and businesses and by discussing its impact on foreign researchers. Further, this Part analyzes how narrowing the list of controlled technologies facilitates the scientific research and innovation necessary to advance U.S. national security.

Part V recommends using the Visa Mantis screening process as the primary method of providing information to the federal government on national security threats posed by individuals seeking to enter the U.S., rather than relying on universities. This Part further recommends narrowing the list of controlled technologies to items 1) not readily available to the international

science and technology community beyond the scope of U.S. controls; which, 2) should be intensively protected from dissemination because of substantive and significant application to national security. Finally, Part VI concludes that in light of the globalized, competitive environment, government policies restricting the utilization of foreign national talent impose significant prohibitive barriers on university research, innovation, and collaboration. These barriers present a serious risk of adversely impacting U.S. national security. Thus, regulations should be narrowly crafted to clearly and effectively address specific policy objective without excessively and inappropriately burdening research and industry.

II. Background

At a basic level, export controls are legal prohibitions against exporting certain materials, software or technology without a license.⁶ Violators can face lengthy prison sentences and stiff fines.⁷ Export controls implement a range of national obligations and interests, such as honoring treaties (e.g., nuclear non-proliferation, conventions on chemical and biological weapons), protecting national security, and combating terrorism.

A. The Export Administration Regulations and International Traffic in Arms Regulations Govern U.S. Exports

Espionage laws, patent controls, and other related legislation regulate *purely commercial* items and knowledge that the U.S. exports. The International Traffic in Arms Regulations (“ITAR”) governs the exportation of purely military items and knowledge. Items or knowledge having a *dual-use* (i.e., applicability in both the military and commercial spheres) are subject to the Export Administration Regulations (“EAR”) and fall into two sub-categories. The first

6. See Mark A. Bohnhorst, *Export Controls in University Research: Basics and Problem Areas* (Univ. of Minnesota ed., 2005).

7. *Id.*

category concerns the transfer or release of *items* across a U.S. border while the second addresses the transfer of *technology* or source code (also referred to as “knowledge”). This paper does not address purely commercial items and knowledge, but instead focuses on the rules found in the EAR and ITAR.⁸

1. The EAR in Brief

As mentioned above, the EAR is a set of rules governing the exportation of dual-use technologies. Under the EAR, dual-use exports involve technology “that has[s] both commercial and military or proliferation applications.”⁹ To constitute an export under the EAR, “an actual shipment or transmission of items [including technology or software subject to the EAR] out of the United States,” must occur.¹⁰ In addition, the deemed export regulatory regime controls technology or source code subject to the EAR that is transferred (or released) to a foreign national within the confines of the U.S. Such “releases” are “deemed to be an export to the home country...of the foreign national.”¹¹

The EAR contains a list of items for which licenses are required for exports or reexports

8. *See generally* Bureau of Indus. & Sec., U.S. Dep’t of Commerce, A Frequently Asked Questions Guide to Export Licensing Requirements for Commercial Items, *available at* <http://www.bis.doc.gov/exportlicensingqanda.htm> (providing a comprehensive guide to compliance with United States export regulations, including submissions of export license applications).

9. 15 C.F.R. § 772.1; *see also id.* § 730.3.

10. *Id.* § 772.1. The term “subject to the EAR” is a defined term of art in the EAR used “to describe those commodities, software, technology, and activities over which the U.S. Department of Commerce Bureau of Industry and Security exercises regulatory jurisdiction under the EAR.” *Id.*

11. *Id.*

to certain countries called the Commerce Control List (“CCL”).¹² The list is divided into ten categories, Categories 0-9, covering items such as materials processing, computers, telecommunications, information security, and navigation and avionics. Depending on an item's classification within these categories, a license may be required for export to one country, but not another. In addition to these list-based controls, the EAR identifies other circumstances in which licensing may be required for transactions that would otherwise require no license or would be eligible for a licensing exception. Exports and reexports for which a license may be required (or prohibited altogether) include transactions involving a sanctioned country, a prohibited party, or use in connection with the proliferation of nuclear, chemical, and biological weapons, or related missile systems.¹³

2. The ITAR in Brief

Like the EAR, the ITAR is a set of regulations that governs exports, albeit those of military and space-related goods and technologies. In addition to governing exports of a different nature than the EAR, the definition of export in the ITAR varies from the EAR. Under the ITAR, “sending or taking a defense article out of the United States in any manner” constitutes exporting.¹⁴ In addition, “disclosing (including oral or visual disclosure) or transferring technical data to a foreign person, whether in the United States or abroad,” qualifies as an export.¹⁵

12. *Id.* § 736.2(b)(1)-(3).

13. *Id.* § 736.2(b)(4)-(9).

14. 22 C.F.R. § 120.17(a)(1). “[M]ere travel ... by a person whose personal knowledge includes technical data” does not constitute an export. *Id.*

15. *Id.* § 120.17(a)(4).

Items and technology controlled by the ITAR are contained in United States Munitions List, which the Office of Defense Trade Controls, a subdivision within the Department of State, maintains.¹⁶ The ITAR requires an export license to export an item or technology subject to the list. Note that unlike the EAR, the end destination for the export does not affect the licensing requirement.¹⁷ All exports of U.S. Munitions List goods (referred to as defense articles) and technology require licenses.

B. The Deemed Export Rule

The EAR and ITAR both apply to exports of tangible and intangible items such as technical knowledge or data.¹⁸ As mentioned above, an export of intangible knowledge or data is a deemed export, presumably because upon returning home the foreign national retains the information. The term "deemed export" comes from the EAR, which states that "[e]xport' of technology or software ... includes: ... (ii) Any release of technology or source code subject to the EAR to a foreign national. Such release is deemed to be an export to the home country or countries of the foreign national."¹⁹ Deemed exports may occur quite frequently in academic research settings where foreign nationals are able to observe controlled equipment in use or discuss controlled equipment or technical data. As defined, to be a deemed export, the EAR or ITAR must cover the technical information in question. The EAR defines "technology" as

16. *Id.* §§ 120.1-.2, 121.1; *see* Bureau of Political-Military Affairs, U.S. Dep't of State, U.S. System of Enforcement of Export Controls (2001), *available at* <http://www.state.gov/t/pm/rls/fs/2001/3778.htm>.

17. *Id.*

18. *See* 15 C.F.R. § 734.2(b) (2006); 22 C.F.R. § 120.17.

19. 15 C.F.R. § 734.2(b)(2).

“specific information necessary for the “development,” “production,” or “use” of a product.”²⁰

The EAR limits technology items to items on the Commerce Control List for which there are provisions that control each category on the list. Note that the words “production,”

“development,” and “use” are all defined terms in the EAR.²¹ Similarly, the ITAR covers

“technical data,” which is akin to the EAR’s definition of “technology”.²² Without exclusions to

the EAR and ITAR, many foreign students cannot participate in university research without

export licenses.²³

C. Fundamental Research and Educational-information Exclusions

The EAR and ITAR both contain exclusions that allow universities and researchers to utilize foreign nationals in their research. The most important of these exclusions to universities are the fundamental research exclusion and educational-information exclusion. The

fundamental-research exclusion is created by 15 C.F.R. § 734.8(a) and 22 C.F.R. § 120.11(a)(8).

In its report, the Department of Commerce Inspector General refers to this exclusion as the

20. *Id.* § 772.

21. *Id.* § 772.1. “Production” includes all stages, including: product engineering, manufacture, integration, assembly (mounting), inspection, testing, and quality assurance. “Development” is related to all stages prior to serial production, such as: design, design research, design analyses, design concepts, assembly and testing of prototypes, pilot production schemes, design data, process of transforming design data into a product, configuration design, integration design, layouts. While “use” is defined: operation, installation (including on-site installation), maintenance (checking), repair, overhaul and refurbishing. *Id.*

22. *Compare* 22 C.F.R. § 120.10(a)(1) (“[i]nformation ... which is required for the design, development, production, manufacture, assembly, operation, repair, testing, maintenance or modification of defense articles”), *with* 15 C.F.R. § 772.1 (“[s]pecific information necessary for the 'development,' 'production,' or 'use' of a product.”).

23. *See, e.g.*, Letter from Katharina Phillips, President, Council on Governmental Relations, to Alexander Lopes, Dir., Deemed Exports and Elecs. Div., U.S. Dep’t of Commerce 4 (June 24, 2005), *available at* <http://www.cogr.edu/files/ExportControls.cfm>.

fundamental-research exception, but as noted in the May 2006 Withdrawal, exports either are subject to the EAR or they are not.²⁴ Thus, the term "exclusion" is actually more appropriate for describing material covered by fundamental research, not by the scope of the EAR. This same logic applies for the educational-information exclusion. Although the exclusions are slightly different under the EAR and ITAR, both require that the information be publicly available. Both the EAR and ITAR recognize that if the results of the research enter the public domain from publication, they are inappropriate for export control.²⁵

Generally, the fundamental research exclusion applies for basic and applied research ordinarily published within the scientific community, so long as researchers openly conduct the research and without restrictions on publication or access to or dissemination of the research results.²⁶ The educational-information exclusion, or "teaching exemption," authorizes the disclosure of educational information released by instruction in catalog courses or general scientific, mathematical, or engineering principles commonly taught in colleges and universities without a license.²⁷

The fundamental research exclusions in both the EAR and ITAR derive from the Reagan Administration's national policy stance towards research. In 1985, the National Security Decision Directive ("NSDD-189") established a national policy for controlling the flow of science, technology, and engineering information produced in federally funded research

24. *See* Revisions and Clarification of Deemed Export Related Regulatory Requirements, 71 Fed. Reg. 30,840, 30,841 (May 31, 2006).

25. *See* 15 C.F.R. § 734.8(a); 22 C.F.R. § 120.11(a)(8).

26. *See* 15 C.F.R. § 734.8(a)(5); 22 C.F.R. §§ 120.10(5), .11(a)(8)(i).

27. *See* 15 C.F.R. § 734.9; 22 C.F.R. § 120.10(5).

universities.²⁸ The policy provides that classification should be the only means of restricting access to research with national security implications unless otherwise provided for by statute. Further, all unclassified fundamental research should be without restrictions.²⁹ NSDD-189 uses the findings of the 1982 Corson Report – a National Academy of Sciences study regarding the need for controls on scientific information.³⁰ The Department of Defense and National Science Foundation commissioned the Corson Report in order to respond to growing concerns that significant technology was being obtained by the Soviet Union and that universities may play a large part in that transfer. Contrary to those concerns, the commission found that universities played a minimal role in the Soviet’s acquisition of technology and further, that the national security of the United States required openness in university research in order to nurture exemplary scientific development.³¹

Despite an end to the Cold War, new concerns arose concerning the transfer of sensitive technology to foreign nations thereby jeopardizing the national security of the United States.³² Pursuant to the National Defense Authorization Act for Fiscal Year 2000, the Departments of Commerce, Defense, Energy, and State were required to review export law and report to

28. *See* Nat’l Sec. Decision Directive 189 (Sept. 21, 1985), in *National Security Directives of the Reagan and Bush Administrations: The Declassified History of the U.S. Political and Military Policy, 1981-1991*, at 595, 595 (Christopher Simpson ed., 1995).

29. *Id.*

30. *See* Panel on Scientific Commc’n & Nat’l Sec., Nat’l Acad. of Sciences, *Scientific Communication and National Security* 40-41 (1982).

31. *Id.*

32. In 2002 and 2003, the Bush administration issued a series of related security strategies designed to counter terrorists and other criminal actors, state sponsors of terrorism, weak states, rogue regional actors, and the proliferation of weapons of mass destruction. *See* White House, *The Nat’l Sec. Strategy of the U.S. (2002)*, available at <http://www.whitehouse.gov/nsc/nss.pdf>.

Congress regarding the export of technology and information to countries of concern. In March 2004, the Department of Commerce Inspector General published a report entitled, “Bureau of Industry and Security: Deemed Export Controls May Not Stop the Transfer of Sensitive Technology to Foreign Nations in the United States” (“Commerce Report”). This report reflects the reviews performed by each agency, and lists several deficiencies in the deemed export process.³³

D. The Formation of the Deemed Export Advisory Committee

BIS announced in the May 2006 Notice that it would establish a Deemed Export Advisory Committee under the Federal Advisory Committee Act in recognition of the nature and extent of the public comments received on deemed export control issues.³⁴ Under its Charter, the Advisory Committee was granted broad latitude to recommend changes to the deemed export rules and their implementation.³⁵ The Advisory Committee is comprised of twelve members, split between government, industry, academia, and other experts in the field with experience in national security affairs, scientific research and development policy, and the various technologies

33. For instance, the Commerce Report questioned the EAR’s longstanding policy that based an applicant’s nationality on most recent citizenship or permanent residency. This policy was unlike the ITAR, which took into account an individual’s citizenship and residency from cradle to grave. Among other recommendations, the Commerce Report proposed that the deemed export licensing policy be based on a national’s country of birth. *Id.* at 17. The Report also pointed out that deemed export licensing requirements employ too broad an interpretation of the term “use.”

34. *See* Establishment of Advisory Committee and Clarification of Deemed Export-Related Regulatory Requirements, 71 Fed. Reg. 29,301 (Dep’t of Commerce May 22, 2006), *available at* <http://www.setonresourcecenter.com/register/2006/May/22/29301A.pdf>.

35. The Advisory Committee’s first objective under its Charter is to “develop recommendations for possible improvements to policies on the transfer of technology or source code subject to the Export Administration Regulations to persons within the United States.” *See* Charter of Deemed Export Advisory Committee (2007), *available at* <http://tac.bis.doc.gov/deacchart.htm>.

subject to the EAR. The Secretary of Commerce appoints members to the Advisory Committee, and no member is to serve more than one year on the Committee.³⁶

The Advisory Committee met in open session on six separate occasions between October 2006 and September 2007 and received 37 formal and informal presentations including several from citizens representing themselves or interested organizations. The 26 invited presenters included qualified individuals from governmental organizations, high-tech corporations and educational institutions, including Presidents and Provosts from leading United States research universities and senior executives from United States commercial firms. These presentations generally pointed to specific recommendations that the speakers proffered to the Advisory Committee for due consideration. Many of the recommendations put forward in the public comments overlapped one another, particularly in two key areas. The first was the recommendation to streamline and update the Commerce Control List that many felt was out-of-date and in some instances, attempted to protect obsolete or globally available technologies. A second recurring recommendation was to retain the current interpretation of “use” in the EAR that is, the combination of the six listed criteria comprising the term are operative and not the Commerce Report’s recommendation to redefine “use” as any one of the six criteria individually.

36. *Id.*; but see Benjamin Findley, Revisions to the United States Deemed-Export Regulations: Implications for Universities, University Research, and Foreign Faculty, Staff, and Students 2006 WIS. L. REV. 1223 (2006) (suggesting that the Advisory Committee’s politically appointed membership and the breadth of its duties may result in recommendations reflecting those which have been previously withdrawn).

III. The Deemed Export Advisory Committee's Recommendations Propose Fundamental Changes to the Deemed Export Regulations

A. The Advisory Committee Highlights the Obsolescence of Cold War Era Regulations in the Current Knowledge-driven Economy

Partly in response to strong criticism from universities and industry of the Commerce Department's 2005 Report, the Deemed Export Advisory Committee arose in 2006 to review current deemed export controls comprehensively. The Advisory Committee's findings generally reflect the observations of Professor John W. Houghton in his book, "The Global Knowledge Economy."

A knowledge-based economy is so fundamentally different from the resource-based system of the last century that conventional economic understanding must be re-examined...The knowledge economy increasingly relies on the diffusion and use of knowledge, as well as its creation. Hence the success of enterprises, and of national economies as a whole, will become more reliant upon their effectiveness in gathering, absorbing and utilising knowledge, as well as in its creation. A knowledge economy is, in effect, a hierarchy of networks, driven by the acceleration of the rate of change and the rate of learning, where the opportunity and capability to get access to and join knowledge-intensive and learning-intensive relations determines the socio-economic position of individuals and firms.³⁷

Houghton's concept of a knowledge-driven economy, dependent on the interconnectedness of its networks, is critical to any discussion of deemed export regulations because these controls determine and limit the distribution of technological knowledge to foreign nationals studying or working in the United States.³⁸

37. JOHN W. HOUGHTON, THE GLOBAL KNOWLEDGE ECONOMY 13 (2002), *available at* <http://web.archive.org/web/20071010165323/http://www.tiac.wa.gov.au/directions/paper1/paper1.html>.

38. *See* Deemed Export Advisory Comm., The Deemed Export Rule in the Era of Globalization 53 (2007), *available at* <http://tac.bis.doc.gov/deac.htm>.

Realizing that the issue of knowledge distribution goes directly to the core of the deemed export regulations, the Advisory Committee suggests that limitations on the flow of knowledge have negative potential consequences for both the nation's economy and its national security.³⁹ Deemed export rules at a basic level can significantly influence an organization's decision of who works on what research. The government seeks such restrictions to prevent foreign nationals from transferring sensitive technology with significant military applications to a country of "presumed" concern. For example, deemed export restrictions on a foreign national's access to high productivity computer systems ("HPCS") have a profound impact on both the economy and national security.⁴⁰ The dilemma of regulating HPCS encapsulates only part of the problem that the Advisory Committee addressed in its review of export controls. The Advisory Committee grapples with a much broader issue at a fundamental level – specifically, that in "today's post-Cold War globalizing, internet-connected world, knowledge is a commodity that is exceptionally difficult to control if for no other reason than that it can be stored in the human brain, and humans are becoming increasingly mobile."⁴¹

1. Findings and Recommendations of the Advisory Committee

In its report, the Advisory Committee found that the obsolescence of the current deemed export regime has been brought about by "profound developments in science and technology, the

39. *Id.*

40. See U.S. Gen. Accounting Office, Report to Congressional Committees on Export Controls: National Security Issues and Foreign Availability for High Performance Computer Exports 3-4 (1998), available at www.fas.org/asmp/resources/govern/gao98200.pdf. In 1998, the Executive Branch determined that High Performance Computer Systems ("HPCS") are a critical national asset for designing or improving advanced nuclear explosives and advanced conventional weapons capabilities. *Id.*

41. Deemed Export Advisory Comm., The Deemed Export Rule in the Era of Globalization 57 (2007), available at <http://tac.bis.doc.gov/deac.htm>.

free-flow of massive amounts of information, the mobility of the world's populace, the burgeoning economies of other nations, and the change in the character of threats to America's security."⁴² Beyond mere inconsistencies, the Advisory Committee principally found that "the existing deemed export regulatory regime no longer effectively serves its intended purpose and should be replaced with an approach that better reflects the realities of today's national security needs and global economy."⁴³ In finding that the current deemed export regulations possess a number of shortcomings, the Advisory Committee made two general recommendations, as well as a seven-step decision-making construct. The Advisory Committee's report depicts the construct graphically and presumably with the intent to be used as a decision-making tree for determining when to submit a deemed export license application and under what circumstances it should be approved. Additionally, the Advisory Committee proscribed a series of specific implementing actions.⁴⁴

Undergirding the Advisory Committee's recommendations lies a rationale that reforming export regulations requires a strengthening of the existing partnership between government and private actors (universities, industry, contractors).⁴⁵ The Advisory Committee first

42. Letter from Norman Augustine, Chairman, Deemed Export Advisory Comm., to the Honorable Carlos Gutierrez, Sec'y, U.S. Dep't of Commerce (Dec. 20, 2007) (on file with author).

43. *Id.* at 85; *see* Letter from Anthony DeCrappeo, President, Council on Governmental Relations, and Robert Berdahl, President, Ass'n of Am. Universities, to Bureau of Indus. & Sec., U.S. Dep't of Commerce (Aug. 15, 2008) (on file with author).

44. Deemed Export Advisory Comm., *The Deemed Export Rule in the Era of Globalization at 85-8 (2007)*, *available at* <http://tac.bis.doc.gov/deac.htm>.

45. The Center for Strategic and International Studies also suggested that government-university and government-industry partnerships are the best approach to strengthen the deemed export regulations.

recommended that the current deemed export licensing process should be simplified for industry and universities in order to “enhance national security,” while strengthening America’s economic competitiveness.⁴⁶ Secondly, the Advisory Committee suggested that because there is an uneven distribution of firms and universities currently seeking deemed export licenses (i.e., Intel Corporation has applied for approximately 1,200 licenses),⁴⁷ BIS should extend its education outreach program to help assure that all parties potentially subject to licensing are familiar with the rules. Only through a strengthened relationship can the deemed export regime begin to adequately address the issues of today’s globalized world.

In order to implement these broad goals, the Advisory Committee suggested a series of implementing actions. First, a group of independent experts should systematically review the Commerce Control List to “eliminate items and technology that have little or no such consequences for national security.”⁴⁸ The panel would consist of experts in the fields of science and engineering with the task of conducting an annual “sunset” review (i.e., “zero-based” analysis) of the list of technologies subject to the Commerce Control List.⁴⁹ The guiding principle of the panel would be to build higher fences around those elements of technical knowledge and military advantage with the greatest consequences for national security, while decreasing the existing walls around large fields of inconsequential technology. Ultimately,

46. Deemed Export Advisory Comm., *The Deemed Export Rule in the Era of Globalization* at 85 (2007), available at <http://tac.bis.doc.gov/deac.htm>.

47. See Letter from Jeff Rittener, Global Export Compliance Manager, Intel Corp. to Bureau of Indus. & Sec., U.S. Dep’t of Commerce (Aug. 18, 2008) (on file with author).

48. Deemed Export Advisory Comm., *The Deemed Export Rule in the Era of Globalization* at 85 (2007), available at <http://tac.bis.doc.gov/deac.htm>.

49. *Id.* at 86.

those seeking to add or preserve items to the proscribed list would bear the burden of proof of showing necessity.

Second, a category of “trusted entities” would voluntarily elect to qualify for special, streamlined treatment in the processing of deemed export license applications.⁵⁰ Academic and industrial research institutions would qualify for such status by complying with certain specified criteria (notably a deemed export compliance program and annual audits by BIS).⁵¹ Qualifying institutions would be able to move individuals within the bounds of the entity without applying for separated deemed export licenses, and would be able to expedite treatment in processing of deemed export applications (when necessary).⁵²

Third, assessments of a foreign national’s loyalty would be more thorough and comprehensive.⁵³ Beyond inquiries of permanent residence or current citizenship, potential licensees would disclose their country of birth, all prior countries of residence and citizenship, as well as the character of prior and present activities and affiliations.⁵⁴ The Advisory Committee presumes that a meticulous examination of the licensee’s current and previous affiliations is necessary to reveal an individual’s probable loyalties, thus decreasing the applicant’s security risk.⁵⁵

Fourth, the current distinction drawn between the product of research and knowledge

50. *Id.* at 86.

51. *Id.* at 93.

52. *Id.* at 86.

53. *Id.*

54. *Id.*

55. *Id.*

regarding the equipment exploited during the research should be moot and irrelevant.⁵⁶ In order to avoid the long-enduring debate in defining “use” technology and its applicability to the deemed export regulations, BIS would adopt a rule governing the transfer of knowledge that does not require distinguishing among research results, the use of research equipment, manufacturing know-how, or other specific categories of knowledge.⁵⁷ A simpler and more determinative process would eliminate the “and/or” considerations currently applied in evaluating “use” exemptions to the deemed export regulations.⁵⁸ Absent the adoption of such a rule, the “and” provision in the current “use” definition should be narrowly interpreted to require all six activities.⁵⁹

Fifth, a more conventional definition of “fundamental research” should replace the current definition that relies on the meaning of “ordinarily published” results.⁶⁰ Currently, the definition of “fundamental research” in the current export administration regulations is, “research where the resulting information is ordinarily published and shared broadly within the scientific community.”⁶¹ The new definition of fundamental research would eliminate such reliance on the circular meaning of “ordinarily published” by excluding “curiosity-driven research seeking new

56. *Id.* at 87.

57. *Id.* at 88.

58. *Id.* at 87.

59. *Id.* at 88.

60. *Id.* at 87.

61. 15 C.F.R. § 734.8; Deemed Export Advisory Comm., *The Deemed Export Rule in the Era of Globalization 92* (2007), *available at* <http://tac.bis.doc.gov/2007/deacreport.pdf>.

knowledge.”⁶² Absent the adoption of the simpler and more determinative definitions, the current fundamental research provisions should stay as they are.

Sixth, the Advisory Committee lastly suggested increasing the use of interactive, web-based self-teaching programs to those subject to deemed export regulations.⁶³ This effort would emphasize self-compliance in academic and industry research environments by clearly laying out the requirements of the deemed export rule.

IV. BIS Must Narrowly Interpret the DEAC’s Recommendations to Clearly and Effectively Address Specific Policy Objectives without Excessively and Inappropriately Burdening Research

The Advisory Committee’s report contained several recommendations to improve and streamline BIS's deemed export rule. Narrowing the scope of technologies on the Commerce Control List subject to deemed export licensing requirements and conducting an outside review of technologies is particularly important because of the increasingly global nature of the scientific and engineering enterprise and the critical need for the United States scientific community to partner in that enterprise.⁶⁴ With great enthusiasm, the scientific and research communities have applauded this recommendation. Nonetheless, despite overwhelming support for such recommendations, a number of issues remain.

62. Deemed Export Advisory Comm., *The Deemed Export Rule in the Era of Globalization 92* (2007), available at <http://tac.bis.doc.gov/2007/deacreport.pdf>.

63. *See id.*

64. Letter from Anthony DeCrappeo, President, Council on Governmental Relations, and Robert Berdahl, President, Ass’n of Am. Universities, to Bureau of Indus. & Sec., U.S. Dep’t of Commerce (Aug. 15, 2008) (on file with author). “*We fully concur with the DEAC’s basic finding that too many technologies are subject to deemed export control. We believe the list of covered technologies should be drastically reduced.*” (Emphasis in original.) “We believe that deemed export requirements should be applied to only a very narrow subset of technologies...” *Id.*

The Association of American Universities-Council on Governmental Relations⁶⁵ and numerous companies worry that the Advisory Committee's recommendation to expand the determination of national affiliation to include country of birth, as recommended earlier by the Commerce Department's Inspector General, creates significant concerns in the areas of civil liberties, privacy, and compliance.⁶⁶ Additionally, the Advisory Committee never addressed troublesome restrictive research clauses for sensitive but unclassified projects, which force universities to lose its fundamental research exclusion. Specifically, the government's increased reliance on such clauses considerably erodes the fundamental principles found in NSDD-189. Finally, although the Advisory Committee mentions that the threat of foreign intelligence collection efforts against the U.S. have fundamentally changed since the end of the Cold War, the Committee's recommendations do not reflect the reality that rogue scientists and industrialists motivated by greed or self-acclaim, not agents of the state, are more likely to attempt to steal controlled technology. Moreover, the legal fiction that foreign nationals who become privy to sensitive information will automatically transfer it to a country of concern – a

65. The Association of American Universities ("AAU") represents 60 U.S. public and private research universities and is devoted to maintaining a strong national system of academic research and education. *See* Association of American Universities About AAU, <http://www.aau.edu/about/default.aspx?id=58> (last visited Nov. 30, 2008). The Council on Governmental Relations ("COGR") is an association of 178 research-intensive universities, affiliated hospitals, and research institutes that is specifically concerned with the impact of government regulations, policies, and practices on the performance of research conducted at its member institutions. *See* Council on Governmental Relations About COGR, *available at* <http://www.cogr.edu/index.cfm> (last visited Nov. 30, 2008). COGR, AAU, and their member institutions participated/hosted many of the Advisory Committees' regional public meetings.

66. Letter from Anthony DeCrappeo, President, Council on Governmental Relations, and Robert Berdahl, President, Ass'n of Am. Universities, to Bureau of Indus. & Sec., U.S. Dep't of Commerce (Aug. 15, 2008) (on file with author).

presumption central to the current deemed export rule – was not a part of the deemed export regime until 1995 and should not continue to play a part in the current regulations.

On May 19, 2008, BIS published a notice of inquiry in order to elicit comments regarding two specific recommendations made by the Advisory Committee with respect to BIS’s deemed export licensing policy.⁶⁷ First, BIS sought comments on whether it should use a more comprehensive set of criteria to assess country affiliation for foreign nationals with respect to deemed exports.⁶⁸ Second, BIS requested comments on whether it should narrow the scope of technologies on the Commerce Control List that are subject to deemed export licensing requirements, and if so, which technologies should be subject to deemed export licensing requirements.⁶⁹

A. Basing License Decisions on the “Probable Loyalties” of Potential Technology Recipients is an In-administrable and Error-prone Process

A more comprehensive assessment of a foreign national's country of affiliation that includes country of birth, prior countries of residence, current citizenship, and the character of an individual's prior and present activities does not benefit national security enough to justify the potential costs to implement such a system. Moreover, the Advisory Committee’s reason for expanding the criteria, to provide an increased level of assurance that unauthorized end-users or activities would not receive technology subject to deemed export licensing requirements, is overly restrictive. The Advisory Committee reasoned that the current practice of using the most recent citizenship or legal permanent residency may not take into account the actual risk of

67. *See* Notice of Inquiry, 73 Fed. Reg. 28795 (Dep’t of Commerce May 19, 2008), *available at* wais.access.gpo.gov.

68. *Id.*

69. *Id.*

diversion of export-controlled technology by the foreign national.⁷⁰ For instance, it noted that most criminal cases of export control violations of which it was aware involve United States citizens and United States legal permanent residents, who are not even subject to deemed export licensing requirements under current BIS policy.⁷¹ Further, the Advisory Committee stated that there is not an adequate distinction for a foreign national residing in a specific country for the majority of his or her lifetime. For example, the risk of diversion posed by an individual recently attaining U.K. citizenship who was born and raised in Iran may be different from that of a native Iranian who became a citizen of the U.K. shortly after birth.⁷² Despite its well-founded concerns addressed below, the Advisory Committee's recommendation to include additional criteria is overbroad, extremely costly, lacks empirical evidence, and implicates violations of civil liberties.

1. Compliance with the Recommendation is Problematic for Companies

Adding new, and arguably more subjective, criteria would be highly problematic for United States companies, would artificially and unnecessarily increase the number of license submissions, and in the end would be counterproductive to the Advisory Committee's avowed objective to simplify the license process. It is manifestly inappropriate for companies to question a government's decision, including our own, to confer legal residency or citizenship upon an individual. Furthermore, given the current state of global mobility, it is unreasonable from a purely licensing perspective to expect companies to submit a license every time a factor suggests a problematic country affiliation (as recommended by the Advisory Committee). These

70. *See* Deemed Export Advisory Comm., *The Deemed Export Rule in the Era of Globalization* 17 (2007), *available at* <http://tac.bis.doc.gov/2007/deacreport.pdf>.

71. *Id.*

72. *Id.* at 19.

circumstances would undoubtedly come up with some frequency. Adoption of the recommendations would lead to unwelcome complications and delay in the hiring and deployment of foreign nationals and, ultimately, a more complex and taxing licensing process for both industry and the government.

Placing the burden on United States companies to define these and other gray area criteria would require delving into areas of inquiry that could open up potential employment discrimination litigation and add burdensome compliance risks, while resulting in a procedurally problematic and expensive divergence from current and accepted employment and technology access practices.⁷³ The government should instead focus on continuing enhancements to the visa process, better coordination with existing security controls in other areas of commerce, as well as enhanced information sharing between government agencies in order to identify and deter individuals (either foreign or otherwise) with agendas contrary to United States national security interests. Companies should be able to rely on the visa process to explore and determine on a personal basis, which foreign nationals pose security threats to the United States and deny entry on that determination. Certainly, the Federal Government is in a better position to make the needed inquiries to make determinations about such individual threats.

United States companies greatly rely on foreign research talent and they cannot afford to maintain unnecessary restrictions that deter such individuals from participating in important research. According to the most recent Science and Engineering Indicators of the 2006 report issued by the National Science Board, the United States' dependence on foreign-born scientists

73. "Under the current deemed export regulatory regime, we estimate that GE's dedicated team of trade controls compliance attorneys, leaders and specialists spend at least 20% of their time and resources managing issues related to deemed exports." Letter from Kathleen Lockard Palma, Counsel, Int'l Trade Regulation, Gen. Elec., to Bureau of Indus. & Sec., U.S. Dep't of Commerce (Aug. 18, 2008) (on file with author).

and engineers is increasing.⁷⁴ The Board's data show that the percent of foreign-born national science and engineering workers rose from 14% to 22% from 1990-2000.⁷⁵ The largest increase (as a subcategory of this trend) was for doctorate holders, which rose from 24% to 38% in important S&T specialties.⁷⁶ More than half of the 2006 graduating engineers in the United States holding doctorates and 45% of Ph.D.s in the physical sciences, computer sciences, and life sciences were foreign born.⁷⁷ One-third of this group came from India, China, or the Philippines.⁷⁸ Among science and engineering doctorate holders working in the United States, one-third of this total group came from India and China.⁷⁹

The Advisory Committee's recommendation would have a detrimental impact on current and prospective employees. If adopted, many companies would face huge setbacks in current research projects by having to question each foreign researcher's loyalty. In calendar year 2003, foreign national students holding temporary visas earned one-third (8,700 of 26,900) of the total number of doctorates (in all fields) awarded in the United States.⁸⁰ Within that subset, more than half of the foreign national degrees (approximately 4,400) earned were in engineering fields of

74. See NAT'L SCIENCE BOARD, SCIENCE AND ENGINEERING INDICATORS 2006 (2006), available at <http://www.nsf.gov/statistics/seind06/pdfstart.htm>.

75. *Id.*

76. *Id.*

77. *Id.*

78. *Id.*

79. *Id.*

80. *Id.*

study.⁸¹ Of the remainder, foreign nationals earned 44% of mathematical and computer science doctorates, and foreign nationals earned 35% of the physical science doctorates.⁸² Such precautions are unnecessary because businesses already protect their valuable technologies by maintaining a number of internal controls and also because the recommendation fails to offer any greater security protection.

Research-intensive companies currently utilize intellectual property protection, non-disclosure agreements, and employee screening to protect their valuable technology. These protections are in place because companies have strong commercial incentives to maintain strict confidentiality when undertaking expensive research projects. Furthermore, research-intensive companies usually hire non-United States researchers on a permanent basis. Rather than preventing diversion of sensitive technology, the Advisory Committee policy may only increase efforts to falsify employee documentation.

The recommendation would also impose additional financial and administrative costs. Mandating additional "potential" criteria for interpretation, applied to a wide variety of individual circumstances and subsequent evaluation, will greatly increase the burden on companies and on the government. Companies will have to collect significant additional information and, in many cases from multiple sources in order to ensure completeness, and to evaluate its potential significance. General Electric estimates that maintaining a system of

81. *Id.*

82. *Id.* Only about 900 (approximately 10%) of the 8,700 total doctorates awarded to foreign nationals in 2003 were in non-S&T fields of study. In pre-graduation surveys, many of these students stated that they planned to stay in the United States after they completed their education, although this is a trend that is gradually reversing.

background checks, training, and management of its required licenses would cost more than \$1 million exclusive of the effect on nonemployees, global operations and other GE businesses.⁸³

Technology kept within the confines of a company or university should not require individual licensing, particularly to share with employees or students inside the United States. Empowering companies to rely on internal control programs and to leverage their strong internal controls around intellectual property protection will increase efficiency and benefit national security by ensuring that resources are devoted to the highest and best use by industry and government. Companies are better equipped to maintain internal control systems on technology to prevent the unlawful diversion of technology rather than to conduct in depth evaluations of the affiliations of their employees.

2. Implementing the Recommendation is Problematic for Universities

Expanding the determination of national affiliation of licensees also presents many problems for universities, especially those who rely on foreign talent for research. Universities do not have the information, expertise, or resources to conduct full background and loyalty checks thoroughly on its foreign students and employees.⁸⁴ Expecting campuses to determine

83. See Letter from Kathleen Lockard Palma, Counsel, Int'l Trade Regulation, Gen. Elec., to Bureau of Indus. & Sec., U.S. Dep't of Commerce (Aug. 18, 2008) (on file with author).

Estimated Direct Costs for a Small Subset of GE Operations

Costs to identify additional national affiliations validate status, update records, etc.	\$236,500
Costs associated with developing deemed export license applications, managing licenses, recordkeeping and administrative costs	\$206,250
Training costs	\$716,520
Total	\$1,159,270

the potential loyalties and affiliations of its foreign students, beyond their citizenship, is an unreasonable burden and a poor means to ensure national security.⁸⁵ In addition to imposing significant costs on each university for providing staff, training, and time, the recommendation raises “serious questions about privacy and civil liberties that arises when the federal government makes distinctions based on national origin or perceived foreign loyalties.”⁸⁶ The assumption that all individuals who hold affiliations with a particular country still may hold some foreign allegiance, although they are not citizens of that country, is overly broad.⁸⁷ Such blanket policies threaten and curtail fundamental values and freedoms that the United States has a tradition of staunchly defending. Instead of expanding the criteria in a way that might contradict the nation’s fundamental beliefs, the Association of American Universities-Council on Government Relations suggest an alternative way to determine foreign loyalty:

A foreign national from a country of concern for a particular technology should be excluded from access to that controlled technology only if the person transferring the technical information to a foreign national has specific and credible information that this individual will: a) export controlled technology abroad to a country for which the technology is controlled, or b) commit or support an attack on the United States with information they have obtained about a controlled technology.⁸⁸

84. *See* Letter from Anthony DeCrappeo, President, Council on Governmental Relations, and Robert Berdahl, President, Ass’n of Am. Universities, to Bureau of Indus. & Sec., U.S. Dep’t of Commerce (Aug. 15, 2008) (on file with author).

85. *Id.*

86. *Id.*

87. *Id.*

88. *Id.*

Imparting a “knowledge” standard into determinations of loyalty also reflects the findings of the Advisory Committee regarding foreign collection efforts.⁸⁹

The current deemed export rule is premised on a legal fiction that domestic transfers of technical knowledge and information with non-U.S. students are, in every case, equivalent to an export and that government authorization, special requirements, and conditions are necessary to safeguard national security. In fact, absent specific evidence or indications to the contrary, there is not meaningful basis to presume that a transfer of technology to a foreign national in the United States will result in an unauthorized export or diversion. To the contrary, there is no indication of harming national security from relying on the current test of national affiliation – country of citizenship. Nor is there a rationale as to how such a background review would decrease the likelihood of a foreign national disclosing controlled information in a way that would harm United States national security. There is simply no demonstrated need or justification for universities to try to look beyond legal citizenship as a means of predicting future unlawful diversion of technology, especially considering the significant costs. Regardless of the criteria BIS decides to adopt, the deemed export rule excludes U.S. citizens, residents, or green card holders, which are precisely the group responsible for the majority of corporate espionage violations.

The current legal fiction fundamental to operation of the current deemed export regime contradicts government reports regarding scientific and industrial espionage. According to the Foreign Economic Collection and Industrial Espionage, 2005 report, “most foreign students and

89. See DEEMED EXPORT ADVISORY COMM., THE DEEMED EXPORT RULE IN THE ERA OF GLOBALIZATION 70-3 (2007), *available at* <http://tac.bis.doc.gov/2007/deacreport.pdf>. This standard was the applicable rule for determining deemed exports prior to 1994. See 15 C.F.R. § 779.1(b)(1) (1993).

academics working in United States research institutions are not involved with United States technology theft. In fact, many significantly contribute to the advancement of research at their respective universities and institutes.”⁹⁰ Although a record number of 108 countries were involved in collection efforts against sensitive and protected United States technologies,⁹¹ only a small number of countries, including China and Russia, accounted for much of the targeting.⁹²

“Moreover, evidence suggests that the vast majority of those who did attempt to steal technology or trade secrets did not initially come to the United States with that intent nor were they directed to do so by agents of foreign governments. Instead, after finding that they had access to information that was in great demand abroad, most engaged in illegal collection to satisfy their desire for profits, for academic or scientific acclaim, or out of a sense of patriotism for their home countries.”⁹³

According to the Espionage report, the “spy” could be just about anyone, including a United States citizen.⁹⁴ As for the impact on individuals with improper motives, the recommendation is more likely to encourage attempts to evade the requirements, instead of resulting in their detection. Additional subjective criteria will enhance the incentives for subversives to create false documentation. Moreover, as the Report observed, it would not address the issue of corporate espionage cases involving United States citizens or legal permanent residents.

90. OFFICE OF THE NAT’L COUNTERINTELLIGENCE EXECUTIVE, ANNUAL REPORT TO CONGRESS ON FOREIGN ECONOMIC COLLECTION AND INDUSTRIAL ESPIONAGE-2005 (2006), *available at* <http://handle.dtic.mil/100.2/ADA465038>.

91. According to the Espionage report, figures are from the federal fiscal year 2005 (Oct. 04 – Sep. 05). *Id.*

92. Just as they have since the Counterintelligence Community first began systematic tracking of foreign collection efforts in 1997. *Id.*

93. “Private-sector players -- foreign businessmen, scientists, engineers, students, and academics -- were active collectors in FY2005, although those who engaged in theft represented only a small fraction of total foreign experts in the United States.” *Id.*

94. *Id.*

B. Controlling the Deemed Export of Only the Most Critical Technologies Will Facilitate the Scientific Research and Innovation Necessary to Advance U.S. Security

Among its recommendations, the Advisory Committee urged that BIS narrow the scope of technologies on the Commerce Control List and involve an outside panel of experts to conduct an annual “zero-based” review of which technologies should be on the list, with an eye toward determining which technologies should be subject to deemed export licensing requirements.⁹⁵ In its report, the Advisory Committee recommended narrowing the scope of technologies on the CCL because it believed that BIS should concentrate on those technologies having the greatest national security concerns and should eliminate from the CCL those technologies having little national security concerns. By building higher walls around fewer technologies, the Advisory Committee believed that BIS could more effectively protect United States national security interests while maintaining United States innovation.

BIS announced the formation of the Emerging Technologies and Research Advisory Committee on May 23, 2008 because of public comments submitted to it in 2007 regarding the CCL,⁹⁶ the Advisory Committee’s Final Report, and a Presidential directive⁹⁷ calling for BIS to regularly reassess and update the CCL. The Emerging Technologies and Research Advisory Committee (“ETRAC”) is a technical advisory committee established under the terms of the

95. *See* Deemed Export Advisory Comm., *The Deemed Export Rule in the Era of Globalization 21-2 (2007)*, available at <http://tac.bis.doc.gov/deac.htm>.

96. In response to a “Request for Public Comments on a Systematic Review of the Commerce Control List,” published in the Federal Register on July 17, 2007, BIS received public comments stating that the CCL was not keeping pace with technology and suggesting that university experts play a greater role in updating the list.

97. A Dual-Use Trade Reform directive on January 22, 2008 called for the constant reassessment of export controls to ensure that they control the export and reexport of sensitive items while minimizing their impact on United States economic competitiveness and innovation. *See* Nat’l Sec. Presidential Directive 56 (Jan. 22, 2008), available at http://www.bis.doc.gov/pdf/nspd_fact_sheet_1-16-2008.pdf.

Export Administration Act, International Emergency Economic Powers Enhancement Act, and Federal Advisory Committee Act, and comprises representatives from research universities, government research labs, and industry. The ETRAC will make recommendations to BIS regarding emerging technologies on a regular basis as well as advise BIS on the conduct of a “zero-based” technology review envisioned by the Advisory Committee.⁹⁸ While BIS is already conducting a systematic review of the CCL to assess what controls it should retain or revise, many technologies on the CCL are subject to multilateral controls and thus the United States cannot unilaterally change them. However, deemed export licensing requirements are not multilateral and thus the United States may change the requirements without agreement by other countries. Therefore, BIS is focusing this recommendation for a zero-based review only on those technologies that should be subject to deemed export licensing requirements.

Given the widespread use of technically trained non-U.S. researchers in product development activities in the U.S., imposition of a deemed export requirement has a disproportionate impact on the use of technical talent and the organization of R&D in large segments of U.S. industry and across university campuses. Many companies and universities argue that only technology areas specifically controlled by one of the multilateral proliferation regimes (the Australia Group, the Missile Technology Control Regime and the Nuclear Suppliers Group), are focused enough and are of high enough risk to have specific deemed export requirements.⁹⁹ Items controlled by the proliferation regimes represent a relatively small subset

98. See Notice of Inquiry, 73 Fed. Reg. 28795 (Dep’t of Commerce May 19, 2008), *available at* [wais.access.gpo.gov](https://www.access.gpo.gov) (explaining that a zero-based review means determining what should be controlled without reference to what is currently controlled, rather than reviewing current controls and identifying what should be decontrolled).

of those currently caught by deemed export controls, and as a general matter, are not widely disseminated within civilian enterprises. As a result, only companies that specialize in these critical products and technologies will contain such items.

In addition, there is a clear multilateral consensus both on the need to control these technologies, and on which countries are the targets of these controls. A similar agreement does not exist for other dual-use items controlled by the Wassenaar Arrangement.¹⁰⁰ In order to level the playing field for United States companies and universities using these items, the government should make an effort to "multilateralize" the concept of deemed export for this subset of technologies. Availability in fact of the technology outside the U.S. should be a major, if not determining factor as to whether an item remains on the control list.

V. Recommendations

Congress, the President, and the Office of Science and Technology Policy all agree that academic research plays a vital role in the American economy in light of the current globalized world.

America's economic strength and global leadership depend in large measure on our Nation's ability to generate and harness the latest in scientific and technological developments and to apply these developments to real world

99. *See, e.g.*, Letter from Anthony DeCrappeo, President, Council on Governmental Relations, and Robert Berdahl, President, Ass'n of Am. Universities, to Bureau of Indus. & Sec., U.S. Dep't of Commerce (Aug. 15, 2008) (on file with author); Letter from Kathleen Lockard Palma, Counsel, Int'l Trade Regulation, Gen. Elec., to Bureau of Indus. & Sec., U.S. Dep't of Commerce (Aug. 18, 2008) (on file with author); Letter from Jeff Rittener, Global Export Compliance Manager, Intel Corp. to Bureau of Indus. and Sci., U.S. Dep't of Commerce (Aug. 18, 2008) (on file with author).

100. The Wassenaar Arrangement establishes lists of items for which member countries are to apply export controls. Member governments implement these controls to ensure that transfers of the controlled items do not contribute to the development or enhancement of military capabilities that undermine the goals of the Arrangement, and do not divert to support such capabilities. *See* Bureau of Indus. & Sec., U.S. Dep't of Commerce, *The Wassenaar Arrangement An Overview*, available at <http://www.bis.doc.gov/wassenaar/default.htm> (last visited Nov. 30, 2008).

applications. These applications are fueled by: scientific research, which produces new ideas and new tools that can become the foundation for tomorrow's products, services, and ways of doing business; a strong education system that equips our workforce with the skills necessary to transform those ideas into goods and services that improve our lives and provide our Nation with the researchers of the future; and an environment that encourages entrepreneurship, risk taking, and innovative thinking."¹⁰¹

In concert with this rationale, the Congress passed and the President signed the "America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Sciences" ("COMPETES") Act, a bill to strengthen the United States educational system in science and technology in order for the nation to remain competitive in today's global knowledge economy.¹⁰² However, before such initiatives start to produce home-grown talent capable of filling the heightened demand for highly-qualified researchers, practicing American-born scientists and engineers continue to be in short supply and thus, the country remains heavily reliant upon foreign talent. A statement in the National Academy of Sciences' 2005 report, *Policy Implication of International Graduate Students and Postdoctoral Scholars in the United*

101. AM. COMPETITIVE INITIATIVE, DOMESTIC POLICY COUNCIL, OFFICE OF SCIENCE AND TECHNOLOGY POLICY, THE WHITE HOUSE 1 (2006), *available at* <http://www.whitehouse.gov/stateoftheunion/2006/aci/>. The President's American Competitiveness Initiative launched in early 2006, which the Office of Science and Technology Policy describes in the following terms: "Keeping our competitive edge in the world economy requires focused policies that lay the groundwork for continued leadership in innovation, exploration, and ingenuity." *Id.*

102. The "America COMPETES Act" is a bipartisan legislative response to recommendations contained in the National Academies report "Rising Above the Gathering Storm" and the Council on Competitiveness report "Innovate America." The America COMPETES Act focuses on three primary areas of importance to maintaining and improving United States' innovation in the 21st Century: (1) increasing research investment, (2) strengthening educational opportunities in science, technology, engineering, and mathematics from elementary through graduate school, and (3) developing an innovation infrastructure. *See* press release, Office of the Press Sec'y, The White House, Fact Sheet: America Competes Act of 2007 – President Bush Signs Legislation Sharing Goals Of His American Competitiveness Initiative (Aug. 9, 2007), *available at* <http://www.whitehouse.gov/news/releases/2007/08/20070809-6.html>.

States, puts this reliance in the following perspective:

As the [science & engineering] expertise rises around the world, it is in the nation's interest to understand better the contributions of international scientists and engineers to the United States economy and national security, create policies that can sustain this contribution, and find ways to attract more United States citizens to careers in [science & engineering].

The American Competitiveness Initiative, the COMPETES ACT, and other such programs will surely help alleviate the United States shortfall in the future years, but in the interim [d]eemed [e]xports remain a national concern.¹⁰³

Significant innovation is occurring in other parts of the world where multinational collaboration is thriving and there are fewer constraints imposed by export restrictions. Many of these foreign activities draw upon individuals educated in the United States. For instance, at Microsoft's Beijing research laboratory, one-third of its programmers have Ph.D.s from United States universities.¹⁰⁴ In fact, a 2006 study conducted by researchers at the Pratt School of Engineering at Duke University concluded that persons from outside the United States founded 52% of Silicon Valley companies and 39% of California start-ups in the 1995-2005 period, with Indians being the predominant ethnic group leading these startups in the second five years of the study.¹⁰⁵ Some of these companies started with venture funding and now employ tens of

103. The National Academies is the same institution responsible for drafting the Corson Report in 1982. See NAT'L ACADEMIES, *POLICY IMPLICATIONS OF INTERNATIONAL GRADUATE STUDENTS AND POSTDOCTORAL SCHOLARS IN THE UNITED STATES (2005)*, available at <http://www.nap.edu/openbook.php?isbn=0309096138&page=R1> (reshaping federal policies that govern the movement and activities of international scientists and engineers, particularly with respect to visa and immigration policy is critical).

104. See AUSTIN WANDA, MALINA HILLS & ELAINE LIM, *THE AEROSPACE CORPORATION, OUTSOURCING OF R&D: HOW WORRIED SHOULD WE BE? (2007)*, available at <http://www7.nationalacademies.org/guirr/Wanda.Austin.pdf>.

105. Mark Lavender, *Skilled, Educated Immigrants Contribute Significantly to United States Economy*, DUKE UNIVERSITY NEWS & COMMUNICATIONS, January 3, 2007, available at <http://www.dukenews.duke.edu/2007/.html>.

thousands of United States workers.¹⁰⁶

Any impact on restricting foreign nationals' ability to engage in unclassified fundamental research could have a devastating impact to the U.S. competitiveness, national security, economic growth and the U.S.'s preeminence in science and engineering research. BIS should supplant its national affiliation determination with the preexisting Visa Mantis review. The Visa Mantis security review is a comprehensive system involving the participation of multiple U.S. government agencies to identify students and scholars that may be affiliated or associated with terrorist groups that could threaten the U.S.'s security or that pose a threat to the U.S.'s national security by illegally transferring sensitive technology. Any additional criteria for reviewing access to CCL technologies by a foreign national should only rely on credible and specific information that a specific individual will export controlled technology for doing harm to the U.S. Assessing "loyalty" is too vague and subjective a term to be meaningful. Moreover,

106. See ANDERSON STUART AND MICHAELA PLATZER, NATIONAL VENTURE CAPITAL ASSOCIATION, AMERICAN MADE 14 (2006), available at http://www.nvca.org/pdf/AmericanMade_study.pdf.

TABLE 1. *Examples of Immigrant-Founded Venture-Backed Public Companies*

Company	Immigrant Founder or Co-founder	Country of Birth	Number of Employees (FY2005)	Industry
Intel Corp.	Andy Grove	Hungary	99,900	Semiconductor & related manufacturing
Solectron Corp.	Winston Chen	Taiwan	53,000	Bare printed circuit board manufacturing
Sanmina-SCI Corp	Jure Sola	Bosnia	48,621	Bare printed circuit board manufacturing
Sun Microsystems	Andreas Bechtolsheim	Germany	31,000	Electronic computer manufacturing
eBay Inc.	Pierre Omidyar	France	12,600	Electronics auctions
Yahoo, Inc.	Jerry Yang	Taiwan	9,800	Web search portals
Google, Inc.	Sergey Brin	Russia	5,680	Web search portals

tracing an individual's place of residence, from birthplace to current country of citizenship is a difficult task that would require resources beyond universities' ability. Engaging in such detailed background research of foreign-born students would violate not only the principle of nondiscrimination and privacy laws, but also the spirit of openness and inclusiveness that have been the hallmark and strength of the American research university for decades. The best protection of national security will allow universities to retain this spirit, which has brought foreign-born luminaries like Albert Einstein, Enrico Fermi, Hans Bethe, Niels Bohr, and Werner von Braun. The visa screening process should be the primary method of providing information to the federal government on national security threats posed by individuals seeking to enter the U.S.

Additionally, incorporating exceptions for "intracompany" licenses or transfers into the deemed export rule to permit U.S. companies to provide *all* of its employees access to controlled technology within their operating units and manufacturing facilities would provide a more cost-effective solution than the Advisory Committee's proposal. The companies themselves are well suited and have considerable commercial incentives to minimize the risk that foreign nationals will receive their sensitive technology subject to the companies' internal controls. Such a system would benefit the exporting community by eliminating the need for qualifying companies to seek individual licenses. This mechanism would also benefit BIS by allowing resources currently dedicated to reviewing deemed export license applications to be rededicated to other valuable purposes. It would also likely be more effective in managing the potential threat to U.S. national security and far more efficiently than the Advisory Committee's approach of basing licensing determinations on the country of birth, prior countries of residence and other comprehensive sets of criteria. Furthermore, technology kept within the confines of a company should not require

individual licenses, particularly to share with employees inside the U.S. Empowering companies to rely on their internal control programs, including the use of intellectual property protection and non-disclosure agreements, will increase efficiency and benefit national security by ensuring that resources are devoted to the highest and best use by industry and government.

As a general matter, U.S. deemed export controls are a unilateral U.S. control, and in its present form, is relatively recent. Prior to 1995, controls on release of technology to non-U.S. nationals in the U.S. were based on the principle that an unauthorized export was not presumed or “deemed” unless there were specific facts that would indicate to a U.S. entity that such a violation were probable. This continues to be a sound basis for controls on technology to non-U.S. nationals, and is conceptually consistent with the Advisory Committee’s recommendations. Furthermore, it is clear that narrowing the range of technologies listed on the CCL as subject to export controls, including deemed export controls, is essential for the list to be effective.

In its current form, the CCL is far too broad and outdated to be a useful tool for protecting vital U.S. national interests. Narrowing the list drastically is essential for strategic effectiveness, credibility and compliance clarity. For example, despite the notion in popular culture that “nanotechnology” means “cutting edge,” nanotechnology is a term covering a huge array of techniques now used in products including textiles, cosmetics and shampoos, which clearly should not be restricted.¹⁰⁷ Another illustration is that many computer encryption technologies that contain rarified knowledge a few years ago are now internationally publicly

107. For example, carbon fibers and filamentary materials are considered carbon nanotubes that actually fall under the technical definitions of the EAR (i.e., strength, etc.), however, the specification and controls are really meant for carbon fibers which are used in military grade composites. Exclusions or exemptions for nanotubes or nanoscale carbon materials are necessary.

available, and existing ECCNs may not adequately define the latest encryption technologies today.

The formation of ETRAC was an undoubtedly positive step for BIS, but the criteria used for its review of export controls must be determined. In order to prevent the chilling effect that the deemed export rule imparts on research and development of new technologies, BIS should narrow its list of controlled technologies to items 1) not readily available to the international science and technology community beyond the scope of U.S. controls; which, 2) should be intensively protected from dissemination because of substantive and significant application to national security. Only information about specific technologies that pose a clear threat to national security interests and cannot be controlled more appropriately by classification should be controlled as deemed exports. If information about a particular technology is reasonably available and can readily be gleaned from elsewhere in the world, deemed export controls should not apply. BIS should narrow the scope of controlled technologies to the most critical covered by the CCL; namely, those appearing on the Wassenaar “very sensitive” list and similarly narrow subsets of the items controlled for nuclear, missile, chemical/biological, and other reasons. The approach should be to “multilateralize” such items so that U.S. companies and universities will not be placed at an unfair disadvantage when competing globally with institutions not subject to such controls. Moreover, dual-use items and information controlled for purposes of deemed exports should be consistent with regulations issued by other federal agencies pertaining to the protection of national and homeland security, i.e., the control of biological agents by the Centers for Disease Control and Prevention, U.S. Department of Agriculture, and the National Institutes of Health. Recognized exclusions for such items should harmonize with the CCL.

VI. Conclusion

U.S. industry and academia rely on their ability to attract, hire, contract and collaborate with foreign nationals as well as U.S. persons in order to improve existing and create new technologies and products and thus to compete effectively in today's global environment. Companies and universities face a serious shortfall of qualified technical experts in technology industries, and it is becoming increasingly more difficult to attract and hire not only qualified U.S. persons but also foreign nationals. Unilateral U.S. government policies such as deemed export controls place U.S. companies and universities at a disadvantage when competing globally for the best-qualified workforce. While the U.S. is a favored destination for individuals seeking academic and professional career opportunities, other countries are increasing their success in attracting the same talent supply. In this competitive environment, U.S. government policies placing barriers to the hiring, deployment and utilization of foreign nationals should be narrowly crafted to clearly and effectively address specific policy objective without excessively and inappropriately burdening industry.