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## University Research Under Siege: How the War on Terror Has Placed Academic Freedom under Fire, 26 J. Marshall J. Computer & Info. L. 547 (2009)

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# UNIVERSITY RESEARCH UNDER SIEGE: HOW THE WAR ON TERROR HAS PLACED ACADEMIC FREEDOM UNDER FIRE

JAMES TEMPLIN\*

## I. INTRODUCTION

The U.S. District Court in Knoxville, Tennessee convicted a professor from the University of Texas who had the potential sentence of up to 150 years in prison and \$1.5M in fines for working with a Chinese research student on a high-technology project.<sup>1</sup> Prosecutors charged professor emeritus Dr. Reece Roth, highly renowned for his work in plasma research, for conspiring to violate the Arms Export Control Act.<sup>2</sup> Under the Act, Professor Roth violated federal law by permitting his American research assistant to share information with his Chinese research assistant.<sup>3</sup> The professor and his research assistants were working as sub-contractors for a Tennessee technology company that was developing plasma technology for the U.S. Air Force.<sup>4</sup> Interestingly, Dr. Roth had secured a patent for the technology used for the research prior to enter-

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\* J.D., The John Marshall Law School 2009; B.A. Political Science, Alma College. The author would like to dedicate this article to Lynda Marie Edds – in fond memory of her love and support.

1. See Duncan Mansfield, *Ex-Tenn. Professor Guilty of Passing Military Data*, A.P., Sept. 3, 2008, available at <http://origin2.foxnews.com/wires/2008Sep03/0,4670,Professor-Secrets,00.html>. Dr. Roth, age 72, was sentenced to 48 months in prison on July 1, 2009. See Press Release, U.S. Department of Justice, Former University of Tennessee Professor John Reece Roth Sentenced to 48 Months in Prison for Illegally Exporting Military Research Technical Data (Jul. 1, 2009), available at <http://knoxville.fbi.gov/dojpressrel/pressrel09/kx070109.html>.

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

3. *Id.*

4. *Id.*

ing into the research contract with the company.<sup>5</sup> 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.<sup>6</sup>

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.<sup>7</sup> 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 export regulations have become increasingly irrelevant in the prevailing globalized commercial, academic and national security environments.<sup>8</sup>

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 ability to compete in the globalized world.<sup>9</sup>

The tragedy of September 11, 2001, the subsequent anthrax attacks, and ongoing international terror threats have markedly changed national and international security. As concerns about threats and terror-

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5. See Darren Dunlap, *Roth Says He Will Retire at End of Semester*, KNOXVILLE NEWS SENTINEL, Apr. 16, 2008, available at <http://www.knoxnews.com/news/2008/apr/16/roth-says-he-will-retire-at-end-of-semester/>. Professor Roth had extensive ties with AGT, the Tennessee technology company in question, and in 1994, he originated the general technology of electrohydrodynamic plasma actuators. See Tom Chester, *Feds Investigating Retired UT Professor: Office Searched, Laptop Seized – Researcher May Have Violated Arms Export Control Act*, KNOXVILLE NEWS SENTINEL, July 1, 2006, available at <http://www.knoxnews.com/news/2006/jul/01/feds-investigating-retired-ut-professor/>. Professor Roth has several patents on technology that AGT has used in his research. *Id.*

6. See Duncan Mansfield, *Ex-Tenn. Professor Guilty of Passing Military Data*, THE ASSOCIATED PRESS, September 3, 2008, available at <http://www.wtopnews.com/?nid=104&sid=1407503>.

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

8. *Id.* at 9.

9. See, e.g., ERA OF GLOBALIZATION, *supra* note 7; 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).

ist 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 current science and technology enterprises.<sup>10</sup> The prevailing globalized commercial, academic, and national security environments have left the United States government “tilting at windmills.”<sup>11</sup> The government can no longer afford to implement a Cold War-era deemed export regulatory regime.

This Comment analyzes the proposed revisions to United States export regulations contained in the Deemed Export Advisory Committee’s 2007 report.<sup>12</sup> While the Advisory Committee’s work was much needed and its recommendations laudable, this comment discusses 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 examines

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10. COMM. ON A NEW GOV’T-UNIV. P’SHIP FOR SCI. AND SEC. & NAT’L RESEARCH COUNCIL, SCI. AND SEC. IN A POST 9/11 WORLD: A REPORT BASED ON REGIONAL DISCUSSIONS BETWEEN THE SCI. AND SEC. CMTY. (2007), *available at* [http://www.nap.edu/catalog.php?record\\_id=12013](http://www.nap.edu/catalog.php?record_id=12013) [hereinafter NAT’L RESEARCH COUNCIL]

11. MIGUEL DE CERVANTES SAAVEDRA, DON QUIJOTE DE LA MANCHA 98 (Burton Raffel trans., W. W. Norton & Co. 1996) (1605). This idiomatic phrase originated in the novel *Don Quijote*, and is used today in reference to persistent engagement in a futile activity. At one point in the novel, Don Quijote fights windmills that he imagines to be giants.

He sees the windmill blades as the giant’s arms:

Just then they came in sight of thirty or forty windmills that rise from that plain. And no sooner did Don Quixote see them that he said to his squire, “Fortune is guiding our affairs better than we ourselves could have wished. Do you see over yonder, friend Sancho, thirty or forty hulking giants? I intend to do battle with them and slay them. With their spoils we shall begin to be rich for this is a righteous war and the removal of so foul a brood from off the face of the earth is a service God will bless.”

“What giants?” asked Sancho Panza.

“Those you see over there,” replied his master, “with their long arms. Some of them have arms well nigh two leagues in length.”

“Take care, sir,” cried Sancho. “Those over there are not giants but windmills. Those things that seem to be their arms are sails which, when they are whirled around by the wind, turn the millstone.” *Id.* at Pt. 1, Ch. VIII.

12. See ERA OF GLOBALIZATION, *supra* note 7.

the evolution and policies underlying the systems of export regulations in the United States.

Part IV 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 V 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 section analyzes how narrowing the list of controlled technologies facilitates the scientific research and innovation necessary to advance U.S. national security. Lastly, Part V analyzes the impact that sensitive but unclassified clauses in government research contracts have on foreign nationals in university research, in light of the government's stated policies regarding export controls.

Part VI 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.<sup>13</sup> This Part further recommends narrowing the list of controlled technologies to items not readily available to the international science and technology community beyond the scope of U.S. controls that should be intensively protected from dissemination because of substantive and significant application to national security. Lastly, this Part recommends reaffirming the stated policy of academic freedom established in NSDD-189.<sup>14</sup>

Finally, Part VIII 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 objectives 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.<sup>15</sup> Violators

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13. The Visa Mantis screening process is addressed in greater specificity in Part VI.

14. The NSDD-189 is a national security directive establishing a national policy for controlling the flow of science, technology, and engineering information produced in federally-funded fundamental research at colleges, universities, and laboratories.

15. See MARK A. BOHNHORST, *EXPORT CONTROLS IN UNIVERSITY RESEARCH: BASICS AND PROBLEM AREAS* (Univ. of Minn. ed., 2005).

can face lengthy prison sentences and stiff fines.<sup>16</sup> 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),<sup>17</sup> 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 exported by the United States. The International Traffic in Arms Regulations (“ITAR”) governs the exportation of purely military items and knowledge.<sup>18</sup> 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.<sup>19</sup> The first category concerns the transfer or release of *items* across a U.S. border while the second addresses

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16. *Id.*

17. See U.S. Dep’t of Commerce, Wassenaar Arrangement, available at <http://www.bis.doc.gov/Wassenaar/default.htm> (last visited Nov. 1, 2008). The Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies, is one of four multilateral export control regimes in which the United States participates. The Arrangement’s purpose is to contribute to regional and international security and stability by promoting transparency and greater responsibility in transfers of conventional arms and dual-use (i.e. those having civil and military uses) goods and technologies to prevent destabilizing accumulations of those items. 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. *Id.*

The Nuclear Suppliers Group is a group of 40 member countries established in 1992 and focused on stemming the proliferation of nuclear weapons. See The Nuclear Suppliers Group, available at <http://www.nsg-online.org/> (last visited Nov. 1, 2008). Iraq’s use of chemical weapons during the Iran-Iraq War (1980-1988) prompted the formation of the Australia Group (“AG”) in 1985. Australia, concerned with Iraq’s development of chemical weapons, recommended harmonization of international export controls on chemical weapons precursor chemicals. As the AG membership grew, it expanded its focus to include chemical production equipment and technologies and measures to prevent the proliferation of biological weapons. Today the AG is composed of 34 member countries. See Australia Group, <http://www.australiagroup.net/en/index.html> (last visited Nov. 1, 2008).

The United States has been a member of the Missile Technology Control Regime (“Regime”) since the regime’s inception in 1987. The focus of the Regime is to limit the proliferation of missiles capable of delivering weapons of mass destruction. Initially, the Regime consisted of only seven members. By the end of Fiscal Year 2002, the Regime has grown to include 33 member countries that have agreed to coordinate their national export controls to stem missile proliferation. See Missile Technology Control Regime, <http://www.mtcr.info/english/index.html> (last visited Nov. 1, 2008).

18. See 22 C.F.R. § 120.2 (2006).

19. See 15 C.F.R. § 730.3 (2009).

the transfer of *technology* or source code (also referred to as “knowledge”).<sup>20</sup> This comment does not address purely commercial items and knowledge, but instead focuses on the rules found in the EAR and ITAR.<sup>21</sup>

### 1. *The EAR in Brief*

The EAR is a set of rules governing the exportation of dual-use technologies.<sup>22</sup> Under the EAR, dual-use exports involve technology “that has[s] both commercial and military or proliferation applications.”<sup>23</sup> 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.<sup>24</sup> 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 United States.<sup>25</sup> Such “releases” are “deemed to be an export to the home country. . . of the foreign national.”<sup>26</sup>

The EAR contains a list of items called the Commerce Control List (“CCL”) for which licenses are required for exports or re-exports<sup>27</sup> to cer-

20. These categories are discussed and cited in great detail in the following section.

21. *See generally* Bureau of Indus. & Sec., U.S. Dep’t of Commerce, A Frequently Asked Questions Guide to Export Licensing Requirements for Commercial Items, <http://www.bis.doc.gov/exportlicensingqanda.htm> (last visited Nov. 1, 2008) (providing a comprehensive guide to compliance with United States export regulations, including submissions of export license applications).

22. *See* 15 C.F.R. § 730.3 (2009).

23. *Id.* at § 772.1; *see also* at § 730.3.

24. *Id.* at § 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.*

25. *See Id.* at § 734.2(b)(2)(ii).

26. An export of technology or software includes,

[a]ny release of technology or source code subject to the EAR to a foreign national. The EAR deems such release as an export to the home country or countries of the foreign national. This deemed export rule does not apply to persons lawfully admitted for permanent residence in the United States and does not apply to persons who are protected individuals under the Immigration and Naturalization Act. *See* 8 U.S.C. 1324b(a)(3) (2009).

Note that the release of any item to any party with knowledge a violation is about to occur is prohibited by 15 C.F.R. § 736.2(b)(10) of the EAR.

27. “Re-export” means an actual shipment or transmission of items subject to the EAR from one foreign country to another foreign country. For purposes of the EAR, the export or re-export of items subject to the EAR that will transit through a country or countries, or be transshipped in a country or countries to a new country, or are intended for re-export to the new country, are deemed to be exports to the new country. *See* 15 C.F.R. § 734.2(b) (2009). In addition, for purposes of satellites controlled by the Department of Commerce, the term “re-export” also includes the transfer of registration of a satellite or operational

tain countries.<sup>28</sup> 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.<sup>29</sup> 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.<sup>30</sup> Exports and re-exports 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.<sup>31</sup> In addition, persons are prohibited from exporting, re-exporting, or participating in any manner in an export or re-export of an item subject to the EAR with knowledge that a violation of the EAR has occurred, is about to occur, or is intended to occur.<sup>32</sup>

## 2. *The ITAR in Brief*

Like the EAR, the ITAR is a set of regulations that governs exports, albeit those of military<sup>33</sup> and space-related<sup>34</sup> goods and technologies. In addition to governing exports of a different nature than the EAR,<sup>35</sup> the definition of export in the ITAR varies from the EAR.<sup>36</sup> Under the ITAR, "sending or taking a defense article out of the United States in any manner" constitutes exporting.<sup>37</sup> In addition, "disclosing (including oral or

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control over a satellite from a party resident in one country to a party resident in another country. *Id.* at § 772.

28. *Id.* at § 736.2(b)(1)-(3).

29. *Id.*

30. *Id.*

31. *Id.* at § 736.2(b)(4)-(9).

32. *Id.* at § 736.2(b)(10).

33. *See* 22 C.F.R. § 120.2 (2006).

34. *Id.* § 121.1; *see* Amendments to the International Traffic in Arms Regulations (ITAR): Control of Commercial Communications Satellites on the United States Munitions List, 64 Fed. Reg. 13,679, 13,680 (Mar. 22, 1999).

35. *Compare* 15 C.F.R. § 730.3 (2009) (providing that the EAR governs the export of items with both military and civilian uses), *and* 15 C.F.R. § 738.1(a) (2009), *with* 22 C.F.R. § 120.1 (2009) (providing that the Department of State has the power to control the export and import of defense articles and services), *and* 22 C.F.R. § 120.3 (2009) (providing that articles and services controlled by the ITAR must be specifically military), *and* 22 C.F.R. § 120.4 (2009).

36. *Compare* 15 C.F.R. § 772.1 (2009) ("[e]xport means actual shipment or transmission of items out of the United States"), *with* 22 C.F.R. § 120.17(a)(1) (2009) ("[e]xport means . . . taking a defense article out of the United States in any manner. . . .").

37. 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.*



visual disclosure) or transferring technical data to a foreign person, whether in the United States or abroad," qualifies as an export.<sup>38</sup>

Items and technology controlled by the ITAR are contained in United States Munitions List,<sup>39</sup> which the Office of Defense Trade Controls, a subdivision within the Department of State, maintains.<sup>40</sup> The ITAR requires an export license to export an item or technology subject to the list.<sup>41</sup> Note that unlike the EAR, the end destination for the export does not affect the licensing requirement.<sup>42</sup> All exports of U.S. Munitions List goods (referred to as defense articles) and technology require licenses.<sup>43</sup>

## B. THE DEEMED EXPORT RULE

The EAR and ITAR both apply to exports of tangible and intangible items such as technical knowledge or data.<sup>44</sup> 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.<sup>45</sup> 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."<sup>46</sup> 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.<sup>47</sup> As defined, to be a deemed export, the EAR or ITAR must cover the technical information in question.<sup>48</sup> The EAR defines "technology" as "specific information necessary for the 'development,' 'production,' or 'use' of a product."<sup>49</sup> The EAR limits technology items to items on the Commerce Control List for which there are provisions that control each

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38. *Id.* at § 120.17(a)(4).

39. *See* Amendments to the International Traffic in Arms Regulations (ITAR): Control of Commercial Communications Satellites on the United States Munitions List, 64 Fed. Reg. 13,679, 13,680 (Mar. 22, 1999).

40. *Id.* at §§ 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/>.

41. *See* 22 C.F.R. § 123.1(a) (2009).

42. *Id.*

43. *Id.* at § 120.2.

44. *See* 15 C.F.R. § 734.2(b) (2006); 22 C.F.R. § 120.17 (2009).

45. *See* 15 C.F.R. § 734.2(b)(2)(ii) (2009).

46. *Id.* at § 734.2(b)(2).

47. *Id.* at § 734.2(b)(3)(i)-(ii).

48. *Id.* at § 734.2(b); 22 C.F.R. § 120.10(a)(1), 120.17(a)(3)-(4).

49. 15 C.F.R. § 772.1 (2009).

category on the list.<sup>50</sup> Note that the words “production,” “development,” and “use” are all defined terms in the EAR.<sup>51</sup> Similarly, the ITAR covers “technical data,”<sup>52</sup> which is akin to the EAR’s definition of “technology.”<sup>53</sup> Without exclusions to the EAR and ITAR, many foreign students cannot participate in university research without export licenses.<sup>54</sup>

### 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 fundamental-research exception, but as noted in the May 2006 Withdrawal, exports either are subject to the EAR or they are not.<sup>55</sup> 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.<sup>56</sup> Although the exclusions are slightly different under the EAR and ITAR,<sup>57</sup> 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 inappro-

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50. *Id.*

51. *Id.* “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.*

52. See 22 C.F.R. § 120.10(a), § 120.17(a)(4) (2006).

53. Compare *id.* at § 120.10(a)(1) (stating that “[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 (stating that “[s]pecific information necessary for the ‘development,’ ‘production,’ or ‘use’ of a product.”).

54. See, e.g., Letter from Katharina Phillips, President, Council on Governmental Relations, to Alexander Lopes, Dir., Deemed Expt. and Elec. Div., U.S. Dep’t of Commerce 4 (June 24, 2005), available at <http://www.cogr.edu/docs/ExportControlCommentLetter.doc>.

55. See Revisions and Clarification of Deemed Export Related Regulatory Requirements, 71 Fed. Reg. 30,840, 30,841 (May 31, 2006), available at <http://researchadmin.uchicago.edu/regulations/DOC-DeemedExport.pdf>.

56. See 15 C.F.R. § 734.9 (2008); 22 C.F.R. § 120.10(a)(5) (2006).

57. For the differences between the definitions of fundamental-research exclusions, compare 15 C.F.R. § 734.8 (2008) with 22 C.F.R. § 120.11(a)(8) (2006). For the educational-information exclusion, compare 15 C.F.R. § 734.9 (2008) with 22 C.F.R. § 120.10(5).

priate for export control.<sup>58</sup>

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.<sup>59</sup> 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.<sup>60</sup>

The fundamental research exclusions in both the EAR and ITAR derive from the Reagan Administration’s national policy stance towards research.<sup>61</sup> 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 universities.<sup>62</sup> 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.<sup>63</sup> Further, all unclassified fundamental research should be without restrictions.<sup>64</sup> NSDD-189 uses the findings of the 1982 Corson Report – a National Academy of Sciences study regarding the need for controls on scientific information.<sup>65</sup> 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.<sup>66</sup>

Despite an end to the Cold War, new concerns arose concerning the transfer of sensitive technology to foreign nations thereby jeopardizing

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58. See 15 C.F.R. § 734.8(a) (2008); 22 C.F.R. § 120.11(a)(8) (2006).

59. See 15 C.F.R. § 734.8(a)(5) (2008); 22 C.F.R. §§ 120.10(5) (2006), 22 C.F.R. §§ 120.11(a)(8)(i).

60. See 15 C.F.R. § 734.9 (2008); 22 C.F.R. § 120.10(5) (2006).

61. See National Security Directives of the Reagan Administration, *available at* <http://www.fas.org/irp/offdocs/nsdd/nsdd-189.htm>.

62. *Id.*; 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 (Christopher Simpson ed., 1995).

63. *Id.*

64. *Id.*

65. See Panel on Scientific Commc’n & Nat’l Sec., Nat’l Acad. of Sciences, Scientific Communication and National Security 40-41 (1982); see NAT’L RESEARCH COUNCIL, *supra* note 10.

66. *Id.*

the national security of the United States.<sup>67</sup> 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 Congress regarding the export of technology and information to countries of concern.<sup>68</sup> 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").<sup>69</sup> This report reflects the reviews performed by each agency, and lists several deficiencies in the deemed export process.<sup>70</sup>

1. *Exclusions Come Under Fire From 2004 Department of Commerce Report*

The Commerce Report found the requirements for a deemed export license – mainly the access to "development," "production," and "use"

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67. 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. The capstone document is the National Security Strategy of the United States of America, issued in September 2002. See White House, The Nat'l Sec. Strategy of the U.S. (2002), available at <http://www.globalsecurity.org/military/library/policy/national/nss-020920.pdf>. Its pervasive theme is the United States vulnerability to attack from new sources and by different means than in the past: "America is now threatened less by conquering states than we are by failing ones. We are menaced less by fleets and armies than by catastrophic technologies in the hands of the embittered few." *Id.* Although the 2002 Security Strategy paints a broad picture of U.S. strategic concerns, it concentrates on a key threat to the United States: sensitive technology in the hands of rogue states:

The gravest danger our Nation faces lies at the crossroads of radicalism and technology. Our enemies have openly declared that they are seeking weapons of mass destruction, and evidence indicates that they are doing so with determination. The United States will not allow these efforts to succeed. We will build defenses against ballistic missiles and other means of delivery. We will cooperate with other nations to deny, contain, and curtail our enemies' efforts to acquire dangerous technologies. *Id.*

68. See National Defense Authorization Act for Fiscal Year 2000, Pub. L. No. 106-65, § 922, 113 Stat. 512, 724 (1999).

69. See Bureau of Indus. & Sec., Office of Inspector Gen., U.S. Dep't of Commerce, Final Inspection Report No. IPE-16176, Deemed Export Controls May Not Stop the Transfer of Sensitive Technology to Foreign Nationals in the U.S. (2004), available at <http://www.oig.doc.gov/oig/reports/2004/BIS-IPE-16176-03-2004.pdf> [hereinafter Final Inspection Report].

70. 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." *Id.*

technical information – as too broadly defined regarding “use.”<sup>71</sup> Under the EAR, the term “use” is composed of six criteria in combination (i.e., all six must occur for an item to be categorized as “use” technology, and consequently potentially requiring a deemed export license). In particular, it suggested that any of the six criteria occurring individually should render an item’s “use” technology subject to potential deemed export-licensing requirements.<sup>72</sup> The report also criticized the current deemed export-licensing policy for focusing only on the subject’s nation of current citizenship instead of all of the nationalities that the foreign national subject has ever maintained.<sup>73</sup> The report recommended that BIS change its policy to require United States entities to “apply for a deemed export license for employees or visitors who are foreign nationals and have access to dual-use controlled technology if they were born in a country where the technology transfer in question is EAR controlled regardless of their most recent citizenship or permanent resident status.”<sup>74</sup>

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71. “Some of BIS’ senior licensing officials maintain that for consistency purposes in the EAR, the word ‘and’ in the definition infers that all of the activities have to be accomplished to constitute ‘use.’ We disagree.” *Id.* at 14.

72. According to the Commerce Report, “the definition could be interpreted as simply a listing of the various activities associated with the term ‘use’ which does not require that each activity be accomplished to constitute use.” *Id.* Moreover, although BIS normally grants approval for a foreign end user to operate, install, maintain, repair, overhaul, and refurbish a piece of controlled equipment exported from the United States in order to permit the full range of uses for an export, the same definition of use does not seem to apply to deemed exports (i.e., foreign nationals “using” the equipment in the United States.). It is unlikely that one individual who has access to the technology for the use of a controlled piece of equipment—as is the case with a deemed export—would have the “knowhow” and be assigned the responsibility for undertaking all six of these tasks. Final Inspection Report, *supra* note 69.

73. Specifically, the Commerce Report states that current deemed export policy permits foreign nationals who originate from countries of concern and have access to controlled dual-use technology to bypass the extensive screening process required of a deemed license application. *Id.* Moreover, if that same foreign national came directly to the United States from Iran on an H1-B visa with the intent of working on controlled dual-use technology, the U.S. employer would be required to apply for a BIS deemed export license for that particular foreign national. The Report states, “BIS’ policy contrasts with that of the State Department’s Directorate of Defense Trade Controls, which requires export license applications involving munitions to include all current nationalities for all foreign national employees expected to receive defense services and technical data.” *Id.* at 16. As such, the State Department prescribes that a person born in Syria, who later becomes a citizen or permanent resident of Canada while retaining his Syrian citizenship, should be regarded as both Syrian and Canadian. *Id.*

74. In a 1998 memorandum to the then-Assistant Secretary for Export Administration, the State Department recommended that BIS amend the dual-use export regulations to follow its policy of noting dual citizenship. Specifically, the State Department recommended that “place of birth be taken into consideration when reviewing applications” because “nationals from state sponsors of terrorism may travel on European passports or have multiple nationalities.” *Id.* at 17. While BIS never responded to the State Department’s memo, its policy remained unchanged. *Id.*

In response to the Commerce Report, BIS published a Federal Register Notice in March 2005 to provide advance public notice and to solicit public comments on proposed EAR rule changes that satisfied the alleged deficiencies noted in the report (“March 2005 Announcement”).<sup>75</sup> Included in the March 2005 Announcement were proposed revisions to change “and” to “or” in the “use” definition, and potential consideration of additional citizenship information in the review of deemed export license applications.<sup>76</sup> Many of the arguments and assertions contained in the public comments received in response to this notice were that the “or” interpretation would capture too many routine operations carried out by foreign national students and employees, and that the proposed rules would constitute a large (and, it was asserted, generally unnecessary) compliance burden on affected organizations.<sup>77</sup>

Similarly, the Department of Defense began to revise its own regulations after receiving a report examining the impact of export controls on contractors, universities, and federally funded research facilities.<sup>78</sup> The report noted that all six of the universities it examined were aware of the EAR and the ITAR, and that most universities it examined qualified for exemptions from the regulations. The report, however, found that most universities rely exclusively on the language of their research contracts with the government in order to identify whether they qualified for the fundamental-research exclusion.<sup>79</sup> In response to the report, the Department of Defense promulgated a new proposed contract clause for the

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75. The March 2005 Announcement states that BIS is “reviewing the recommendations contained in the U.S. Department of Commerce Office of Inspector General Report entitled ‘Deemed Export Controls May Not Stop the Transfer of Sensitive Technology to Foreign Nationals in the U.S.’” Revision and Clarification of Deemed Export Related Regulatory Requirements, 70 Fed. Reg. 15,607, 15,608 (Mar. 28, 2005), *available at* <http://www.fas.org/sgp/news/2005/03/fr032805.html>. If adopted by BIS, certain of these recommendations would “require regulatory changes that would affect existing requirements and policies for deemed export licenses.” *Id.* Thus, BIS announced that it is seeking comments on how these revisions would affect industry, the academic community, and U.S. government agencies involved in research. *Id.*

76. *Id.*

77. *Id.*

78. See Office of the Inspector Gen., U.S. Dep’t of Def., Report No. D-2004-061, Export Controls: Export-Controlled Technology at Contractor, University, and Federally Funded Research and Development Center Facilities (2004), *available at* <http://www.dodig.mil/Audit/reports/fy04/04-061.pdf>.

79. The reliance on this contract language presented problems because not all federal research contracts specified that they contained export-sensitive technology subject to the EAR and the ITAR—and even when they did, the language varied depending on the granting authority. *Id.* at 12. Furthermore, the Department of Defense found one contract involving export-controlled technology in which a foreign graduate student was given unauthorized access to the technology. *Id.* at 16. This led the Department to conclude that universities posed a large risk for the transfer of technology to foreign nationals. *Id.*

Defense Federal Acquisition Regulation Supplement<sup>80</sup> in July 2005.<sup>81</sup>

## 2. *Adverse Effects of Commerce's Recommendations if Adopted*

The proposed regulations in the Commerce Report are troubling because universities would have to secure a large number of licenses for its foreign-national students.<sup>82</sup> This is particularly troublesome to universities that rely on foreign-born research students or universities that typically attract international students.<sup>83</sup> As of 2007, the United States

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80. 48 C.F.R. § 2.000 (2005). The Defense Federal Acquisition Regulation Supplement ("DFARS") is a subset of the Federal Acquisition Regulations, which provide guidance for when restrictions and terms are required in federal contracts. *See id.* § 1.101. Each agency has its own supplemental Federal Acquisition Regulations, for which the Department of Defense is the DFARS. *Id.* at 2.000. Each FAR and FAR supplement has a subchapter that contains all of the contract clauses. *See, e.g., id.* at subpt. 52.1. Often, FAR clauses are passed down from primary contractors to all subcontractors, and some FAR clauses actually require such treatment. *See* Letter from Nils Hasselmo, President, Am. Ass'n of Univs., to Def. Acquisitions Regulation Council 3, 5 (Oct. 12, 2005), *available at* <http://www.google.com/url?sa=t&source=web&ct=res&cd=1&url=http%3A%2F%2Fwww.aau.edu%2FWorkArea%2FDownloadAsset.aspx%3Fid%3D3040&ei=gNVpStiOGIO0NryivacL&usg=AFQjCNFG3C8RD5akoxW6dmdVbCTJMI9d6Q>.

81. *See* Defense Federal Acquisition Regulation Supplement; Export-Controlled Information and Technology, 70 Fed. Reg. 39,976, 39,976-77 (Dep't of Def. July 12, 2005). The Department intended for the new clause to clarify the obligation of contract recipients to comply with U.S. export regulations. *Id.* at 39,977. The proposed regulation would have required defense contracting officers to include a clause in all Department of Defense research contracts identifying any export-controlled technology or information. *Id.* The clause would require universities to "maintain an effective export compliance program," with a control plan that "shall include unique badging requirements for foreign nationals. . . and segregated work areas for export-controlled information and technology." *Id.* Furthermore, the contractor would be required to comply with the EAR and the ITAR and not allow foreign nationals access to export-controlled technology without licenses or authorization. *Id.*

Fortunately, following the BIS decision to withdraw its March 2005 Announcement, the Department of Defense also withdrew this proposed DFARS clause and promulgated two new clauses. *See* Defense Federal Acquisition Regulation Supplement; Export-Controlled Information and Technology (DFARS Case 2004-D010), 71 Fed. Reg. 46,434, 46,435 (Dep't of Def. Aug. 14, 2006). This comment discusses the DFARS clause to the extent necessary to demonstrate how changes to the EAR and ITAR tend to affect other sets of regulations. Currently, DFARS clauses do not contain the segregated work-space and foreign-national badging requirements; rather, contractors are required to comply with the EAR and ITAR and instructed to contact the appropriate agencies for guidance. *Id.*

82. *See* Rachel Yates, *Proposed Changes to US "Deemed Export" Law Threaten International Collaboration - Part II*, INT'L SPACE REV., Oct. 2005, at 5, *available at* <http://www.hollandhart.com/articles/ProposedChangestoUSLaw2.pdf?CFID=2945344&CFTOKEN=36784225> (stating that MIT estimates as many as 100,000 applications might be filed and that many universities and businesses will apply for licenses for all of their foreign researchers).

83. According to a report from the Engineering Workforce Commission of the American Association of Engineering Societies, United States citizens outnumber foreign nationals in undergraduate electrical engineering programs in United States universities by a wide

attracted 22% of the world's students studying outside their home country amounting to nearly 600,000 foreign students studying in the United States.<sup>84</sup> In 2005, applications to U.S. graduate schools from India increased 23% and from China 21%.<sup>85</sup> Overall, international graduate applications increased by 11% between 2005 and 2006.<sup>86</sup> Significantly, the net contribution to the U.S. economy by foreign students is almost 13.5 billion dollars, not including foreign students' immense contributions to research, development, and scientific advancement.<sup>87</sup> Since India and China are both countries of concern to the Department of Commerce, research students from these countries would likely need deemed-export licenses under the proposed regulations.<sup>88</sup>

Universities would also have to incur great costs to comply with the proposed regulations in order to inventory all of its research equipment listed on the CCL.<sup>89</sup> In addition, each foreign student would have to ob-

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margin; United States students accounted for 89 percent of the undergrads in these programs in 2006. However, 51% of the students in masters programs in electrical engineering programs in United States universities were foreign nationals in 2006, while only 49% came from the United States. In PhD programs, foreign nationals made up 71% of the students in 2006. See ENG'G WORKFORCE COMM'N OF THE AM. ASS'N OF ENG'G SOCIETIES, ENGINEERING AND TECHNOLOGY ENROLLMENTS – 2006 (2006) (on file with Illinois Institute of Technology), available at <http://www.ewc-online.org/publications/enrollments.asp>.

84. See Marguerite J. Dennis, *Trends in International Higher Education* (Video online Seminar Series No. 1, 2007), available at [http://handouts.aacrao.org/am07/finished/T0130p\\_M\\_Dennis.pdf](http://handouts.aacrao.org/am07/finished/T0130p_M_Dennis.pdf).

85. *Id.* at 11.

86. *Id.*

87. See Antony Davies, *Understanding the Value of Education: The Economics of College Tuition*, Address at the U.S. House of Representatives Legislative Staff Seminar (Mar. 1, 2004) (transcript available in the George Mason University Library).

88. Even prior to the proposed BIS regulations, the flow of foreign students to the United States slowed due to the more stringent visa-application process. Since the proposed regulations in the March 2005 Announcement would create further road-blocks for foreign researchers in fundamental research, the numbers would likely decline further. See Scott Shane, *Universities Say New Rules Could Hurt U.S. Research*, N.Y. TIMES, Nov. 26, 2005, at A11. Meanwhile, world-class research institutions continue to emerge abroad. See, e.g., Howard W. French, *China Luring Foreign Scholars to Make Its Universities Great*, N.Y. TIMES, Oct. 28, 2005, at A1 (discussing Chinese universities attracting faculty from Princeton); Cristi Hegranes, *Student of Concern*, S.F. WKLY., May 18, 2005 available at <http://www.sfweekly.com/2005-05-18/news/student-of-concern/> (noting that international-student applications are already down 30 percent from 2003, while applications are increasing at universities in India, China, and the United Kingdom).

89. The Council on Governmental Relations ("COGR") asked a number of universities to estimate the burden of assessing the need for deemed export licenses for foreign nationals working in specific laboratories on their campuses under the proposed regulations. The universities reported that the administrative burdens and costs are based on both assembling the inventory of potentially sensitive equipment and on the determination of whether and how each item of equipment to be used in research would be controlled for use technology. The COGR found that a typical research university has thousands of pieces of research equipment in its inventory, and hundreds if not thousands of new pieces are



tain deemed-export licenses for working with such equipment in the course of research. Generally, deemed-export license applications take between 60 and 90 days to process, which significantly burdens and delays the start of research.<sup>90</sup> Once research commences, the university would also be required to monitor the foreign student's participation in the project and restrict access to controlled equipment and information, taking into consideration the student's license.<sup>91</sup> As the research progresses and new technology or information is necessary for the project, the student would have to apply for additional licenses causing further burdens and delays. Altogether, these restrictions significantly burden the research process and establish strong disincentives to employ foreign students in critical university research.<sup>92</sup>

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acquired each year. For example, one university reported that it has more than 50,000 pieces of equipment with an acquisition cost of more than \$5,000 each. This does not include the substantial number of items of equipment below \$5000 that are not maintained in the capital equipment inventory, but also may be controlled. Another university reported more than 70,000 pieces of equipment and one university system reported almost 140,000 pieces of equipment spread over many campuses. Each item of equipment would need to be evaluated for controls in relation to each foreign student and researcher on campus because, unless the open research environment is profoundly altered, any member of the campus community could encounter and receive use technology relating to any piece of equipment.

Several universities calculated that it would cost as much as \$5 million initially for each of them to classify all of the research equipment and apply for deemed export licenses for their researchers and millions of additional dollars in ongoing annual compliance costs. Universities with substantial amounts of equipment have estimated that between 40,000 and 60,000 person hours are necessary to complete the analysis and apply for licenses. Such a commitment of manpower and resources is troubling because universities would be forced to make a considerable reallocation of existing research dollars. *See* Letter from Katharina Phillips, President, Council on Governmental Relations, to Alexander Lopes, Dir., Deemed Exports and Elecs. Div., U.S. Dep't of Commerce (June 24, 2005), *available at* <http://www.cogr.edu/files/ExportControls.cfm>.

90. Ilona Shtrom, Senior Export Policy Analyst, U.S. Dep't of Commerce, Bureau of Indus. & Sec., Deemed Exports and Electronics Div., Address at the Federal Laboratory Consortium for Technology Transfer – Northeast Regional Meeting: How U.S. Export Controls Effect Tech Transfer (Mar. 20, 2007), *available at* [http://www.flcnortheast.org/Albany2007/US\\_Export\\_Controls-Ilona\\_Shtrom.pdf](http://www.flcnortheast.org/Albany2007/US_Export_Controls-Ilona_Shtrom.pdf).

91. *See* Laurie Au, *Restrictions May Fracture Research*, DIAMONDBACK (College Park, Md.), Dec. 15, 2005, *available at* <http://www.diamondbackonline.com/news/2005/12/15/NewsonCampus/Restrictions.May.Fracture.Research-2323828.shtml> (discussing Jianyang Li's relegation to less desirable portions of the research due to export restrictions based on his Chinese nationality).

92. *See, e.g.*, Edward Gerjuoy, *Controls on Scientific Information*, 3 YALE L. & POL'Y REV. 447, 458-59 (1985) (discussing the reaction of the President of the University of Minnesota to the Department of State's request that a foreign student be prohibited from accessing government-funded, unpublished work); Letter from Nils Hasselmo, President, Ass'n of Am. Universities, to Regulatory Policy Div., Bureau of Indus. & Sec., U.S. Dep't of Commerce at 11 (June 27, 2005), *available at* [http://www.aau.edu/research/AAU\\_Comments\\_on\\_Export\\_Controls-06-27-05.pdf](http://www.aau.edu/research/AAU_Comments_on_Export_Controls-06-27-05.pdf) (discussing one university faculty

The Commerce Report also diminishes the educational-information exclusion by narrowing the definition of “use.” Although the report initially reiterated the traditional exclusion from licensing of “educational information released as instruction in catalog courses and associated teaching laboratories,” it came to the conclusion that technology relating to controlled equipment is subject to the deemed export provisions.<sup>93</sup> Such use of equipment is subject to controls even if the research conducted with that equipment is fundamental.<sup>94</sup> Thus, if the ITAR (EAR) deems the use of equipment in fundamental research as an export, then classroom use or instruction on how to use such equipment must likewise be a deemed export.<sup>95</sup> By narrowing its interpretation of the definition “use,” the report essentially eliminates the educational-information exclusion, forcing universities to restrict its classroom and laboratory instruction of foreign students as it would with fundamental research.

#### 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.<sup>96</sup> Under its Charter, the Advisory Committee was granted broad latitude to recommend changes to the deemed export rules and their implementation.<sup>97</sup> 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 subject to the EAR.<sup>98</sup> The Secretary of Commerce

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member who has stopped accepting foreign students because of the cumbersome nature of the restrictions).

93. See Bureau of Indus. & Sec., Office of Inspector Gen., U.S. Dep’t of Commerce, Final Inspection Report No. IPE-16176, Deemed Export Controls May Not Stop the Transfer of Sensitive Technology to Foreign Nationals in the U.S. (2004), *available at* <http://www.oig.doc.gov/oig/reports/2004/BIS-IPE-16176-03-2004.pdf>.

94. *Id.*

95. *Id.*

96. 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>.

97. See CHARTER OF DEEMED EXPORT ADVISORY COMMITTEE (2007), *available at* <http://tac.bis.doc.gov/deacchart.htm>. 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.” The BIS will use these recommendations in revising, as appropriate, its controls on deemed exports.

98. *Id.* On September 12, 2006, U.S. Commerce Secretary Carlos Gutierrez announced the appointment of twelve members to the Advisory Committee. Secretary Gutierrez named Norman Augustine, retired Chairman & CEO of Lockheed Martin Corporation and

appoints members to the Advisory Committee, and no member is to serve more than one year on the Committee.<sup>99</sup>

### 1. *DEAC Hears Public Testimony and Comments*

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.<sup>100</sup> 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.<sup>101</sup> Sessions took place at both the classified and unclassified levels. Persons involved with the topic of deemed exports representing associations, law firms, and other interested parties gave informal remarks.

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Robert Gates, the President of Texas A&M as Co-Chairs of the Advisory Committee. The other ten members of the Advisory Committee include: Albert Carnesale, PhD, Former Chancellor of the University of California at Los Angeles; Ruth David, PhD, President & CEO, Analytic Services, Inc.; The Honorable John Engler, President, National Association of Manufacturers; Anthony Frank, PhD, Provost and Senior Vice President, Colorado State University; General John A. Gordon, Former Deputy Director, Central Intelligence Agency; Sean O'Keefe, Chancellor, Louisiana State University; Eva Pell, PhD, Senior Vice President and Dean of the Graduate School, Penn State University; Michael Splinter, CEO, Applied Materials; James Siedow, Vice Provost for Research and Professor of Biology, Duke University; William A. Wulf, PhD, President, National Academy of Engineering and Professor of Computer Science and University Professor, University of Virginia. *See also* Press Release, Bureau of Indus. & Sec., U.S. Dep't of Commerce, Commerce Secretary Announces Advisory Committee to Protect National Security and Increase American Competitiveness & Innovation (12 Bus. and Academic Leaders Appointed) (Sept. 12, 2006), available at [http://www.bis.doc.gov/news/2006/advisorcommittee09\\_12\\_06.htm](http://www.bis.doc.gov/news/2006/advisorcommittee09_12_06.htm).

99. *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).

100. *See* Agenda for Deemed Export Advisory Committee Meeting (Jan. 22, 2007), available at [http://www.aeanet.org/governmentaffairs/gakm\\_DEACAgendas012207.asp](http://www.aeanet.org/governmentaffairs/gakm_DEACAgendas012207.asp). On January 22, 2007, an Advisory Committee meeting included: opening remarks from the Co-chairs and members of the Advisory Committee; formal stakeholder presentations made by JPMorgan Chase, Qualcomm, Boeing, and others; two hours for public comments; a press briefing; an onsite visit to the corporate headquarters of Intel Corporation; and a closed session for Advisory Committee members.

101. *Id.* For example, the January 22, 2007 meeting featured Mr. Arthur Bienenstock from Stanford University; Mr. Don Weadon from Weadon and Associates; Mr. Steve Kott of AMD; Mr. William B. Linscott, Director of Export Management at Boeing; Kathleen Gebeau, Director of Export Compliance at Qualcomm; and Mr. Larry Christiansen from JPMorgan Chase Vastara, Inc.

These presentations generally pointed to specific recommendations that the speakers proffered to the Advisory Committee for due consideration.<sup>102</sup> 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.<sup>103</sup> A second recurring recommendation was to retain the current interpretation of “use” in the EAR, which meant that the term encapsulates all six of the listed criteria rather than the Commerce Report’s recommendation to redefine “use” as any *one* of the six criteria individually.<sup>104</sup>

### III. POLICIES UNDERLYING UNITED STATES EXPORT REGULATIONS: EVOLUTION OF THE EAR AND ITAR

As noted above, two sets of regulations govern exports in the U.S. – the EAR and ITAR. These two regulatory schemes were created under three different acts: the Export Administration Act of 1979 that led to the creation of the EAR, and the Mutual Security Act of 1954 and International Security Assistance and Arms Export Control Act of 1976 that led to the creation of the ITAR.

The Export Administration Act of 1979 greatly expanded its precursor, the Export Administration Act of 1969.<sup>105</sup> The 1979 Act included

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102. *Id.*

103. *Id.*

104. *Id.*

105. See NAT’L COUNCIL FOR SCI. AND THE ENV’T, CONG. RESEARCH SERV., NO. RL30169, CRS REPORT FOR CONGRESS: EXPORT ADMINISTRATION ACT OF 1979 REAUTHORIZATION, SUMMARY (2001), available at <http://www.ncseonline.org/nle/crsreports/international/inter-22.cfm> [hereinafter CRS REPORT].

The 107th Congress has shown an interest in revising the Export Administration Act of 1979 (“EAA”). The EAA, which had last expired in 1994, was reauthorized until August 20, 2001 at the end of the 106th Congress (H.R. 5239, P.L. 106-508). The Export Administration Act of 2001 (S. 149) was introduced by Senator Mike Enzi on January 23, 2001. The bill would delegate to the executive branch express constitutional authority to regulate foreign commerce. This delegation of export controls has traditionally been temporary, and when it has lapsed, the President has declared a national emergency and maintained export control regulations under the authority of an executive order. The EAA, which was written and amended during the Cold War, focuses on the regulation of exports of those civilian goods and technology that have military applications (dual-use items). Export controls were based on strategic relationships, threats to U.S. national security, international business practices, and commercial technologies that have changed dramatically in the last 20 years. Many Members of Congress and most U.S. business representatives see a need to liberalize U.S. export regulations to allow American companies to engage in generally unrestrained international competition for sales of high-technology goods. But, there are also many Members and national security analysts who contend that liberalization of export controls over the last decade has contributed to foreign threats to U.S. national security, that

expansive "Findings" and "Congressional Declaration of Policy" sections and also established the Commerce Control List.<sup>106</sup> Particularly, the Act shed light on the national security and economic motivations behind the legislation. For example, the Act provided that, to the maximum extent possible, the controlled technology was to be restricted to "militarily critical goods and technologies."<sup>107</sup> In addition, the Act stated that it should limit controlled technology to the extent that it is available in other countries, contemplating international cooperation in the control of sensitive goods.<sup>108</sup>

In light of the recent proposed revisions to the EAR suggested by the BIS, a number of congressional policy declarations in the Act remain relevant, especially since a national security rationale forms the basis of the revisions. Policy statements relevant to the current revisions are as follows:

(2) It is the policy of the United States to use export controls only after full consideration of the impact on the economy of the United States and only to the extent necessary—

(A) to restrict the export of goods and technology which would make a significant contribution to the military potential of any other country or combination of countries which would prove detrimental to the national security of the United States;

(B) to restrict the export of goods and technology where necessary to further significantly the foreign policy of the United States or to fulfill its declared international obligations.<sup>109</sup>

First, the language added to the 1969 Act in section (2), "only after full consideration of the impact on the economy of the United States and only to the extent necessary,"<sup>110</sup> indicates Congress's intent to have export controls promulgated only after weighing the effect of those regulations on the economy. This statement of purpose significantly contemplates restrictions on research, which is a driving force of a knowledge-based national economy. Second, the language in sections (2)(A) and (B)<sup>111</sup> suggest the role of export controls in fighting international terrorism, which is extremely relevant post 9/11. Sections (8) and (9),<sup>112</sup> however, both seem to support a more cooperative, multilateral approach to fighting international terrorism. Section (8) provides: "to

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some controls should be tightened, and that Congress should weigh further liberalization carefully.

106. *Id.*

107. Export Administration Act of 1979, Pub. L. No. 96-72, 93 Stat. 503 (1981) (codified as amended at 50 U.S.C. app. §§ 2401-2420 (2000)).

108. *Id.*

109. *Id.*

110. *Id.*

111. *Id.*

112. *Id.*

achieve this objective [using export controls to prevent support of international terrorism], the President shall make reasonable and prompt efforts to secure the removal or reduction of such assistance to international terrorists through international cooperation and agreement before imposing export controls.”<sup>113</sup>

Congress’s explicit limitation, “the President *shall* make . . . efforts . . . through international cooperation and agreement *before* imposing export controls,”<sup>114</sup> in combination with weighing the economic effects of imposing controls as suggested in section (2), the limitation appears to provide for a pro research-based approach to export regulations. Furthermore, section (9) provides:

[I]t is the policy of the United States to cooperate with other countries with which the United States has defense treaty commitments or common strategic objectives in restricting the export of goods and technology which would make a significant contribution to the military potential of any country or combination of countries which would prove detrimental to the security of the United States.<sup>115</sup>

This section, like section (8), suggests that Congress contemplated a cooperative and multilateral approach to keeping sensitive technology from leakage to countries of concern, threatening U.S. national security.

#### IV. 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.<sup>116</sup> The Advisory Committee’s findings generally reflect the observations of Professor John W. Houghton in his book, “The Global

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113. Export Administration Act of 1979, Pub. L. No. 96-72, 93 Stat. 503 (1981) (codified as amended at 50 U.S.C. app. §§ 2401-2420 (2000)).

114. *Id.* (emphasis added).

115. *Id.*

116. CHARTER OF DEEMED EXPORT ADVISORY COMMITTEE (2007), available at <http://tac.bis.doc.gov/deacchart.htm>.

United States DEPARTMENT OF COMMERCE

CHARTER OF THE DEEMED EXPORT ADVISORY COMMITTEE

The Secretary of Commerce (“Secretary”), pursuant to duties imposed by law upon the Department, including the Export Administration Act of 1979, as amended (50 United StatesC. app. §§ 2401- 2420 (2000)), the International Emergency Economic Powers Act (50 United StatesC. §§ 1701 - 1706 (2000)), and the Federal Advisory Committee Act, (5 United StatesC. app. § 2 (2005)), and with the concur-

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rence of the General Services Administration, hereby renews the Deemed Exports Advisory Committee (DEAC).

#### OBJECTIVES AND DUTIES

1. The DEAC will 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. These recommendations are intended to be used by the Secretary, the Under Secretary for Industry and Security ("Under Secretary"), and the Department of Commerce's Bureau of Industry and Security ("BIS") in revising, as appropriate, its controls on such exports.
2. The DEAC will update the Secretary regularly on its progress during the development of its recommendations and will agree upon the contents of its recommendations before advising the Secretary to adopt any or all of them.
3. The DEAC will function solely as an advisory body and will comply with the requirements of the Federal Advisory Committee Act.

#### MEMBERSHIP

1. The DEAC shall not exceed 12 members to be appointed by the Secretary to assure a balanced representation of views among business executives, university administrators, and other experts in the field. Members will be Special Government Employees.
2. Members shall have a current Secret clearance in order to analyze intelligence products relevant to their work.
3. Each member shall be appointed for 12 months and will serve at the discretion of the Secretary. Appointments shall be renewable for additional terms.
4. The Secretary shall appoint the Chairperson or Co-Chairpersons. The Secretary may also appoint one or more Vice-Chairpersons.
5. Members will be subject to all ethical standards and rules applicable to Special Government Employees.
6. Members will be selected on a clear, standardized basis, in accordance with applicable Department of Commerce guidance.

#### ADMINISTRATIVE PROVISIONS

1. The DEAC shall report on its activities and recommendations to the Secretary or to other individuals within the Department of Commerce that the Secretary may designate.
2. The Secretary shall appoint the Under Secretary as the Executive Director of the DEAC. The Under Secretary shall not be a member of the DEAC.
3. The Director of BIS's Office of National Security and Technology Transfer Controls shall be the DEAC Designated Federal Officer (DFO), and Committee staffing will be coordinated through his/her office.
4. The DEAC shall meet as deemed necessary by the Secretary, but in no case less than quarterly.
5. BIS shall provide funding and administrative support for the Committee.
6. Members of the DEAC shall not be compensated for their service, but shall on request be allowed travel expenses, including per diem in lieu of subsistence, as authorized by law for persons serving intermittently in government service (5 United StatesC. §§ 5701 - 5707), consistent with the availability of funds.

Knowledge Economy.”<sup>117</sup> Houghton explains this phenomenon in the following terms:

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 utilizing 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.<sup>118</sup>

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.<sup>119</sup>

In a knowledge economy, according to Professor Houghton, the interconnectedness refers to the people and firms searching for “linkages to promote inter-personal and inter-firm learning, and for outside partners and networks to provide complementary assets.”<sup>120</sup> These relationships help spread the costs and risks associated with innovation, provide additional talent, gain access to new research results, acquire key technologic

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7. The DEAC may establish subcommittees of its members as necessary, subject to the relevant provisions of the Department of Commerce Committee Management Handbook. The Secretary or his designee shall designate the Chairperson and members of any subcommittee.

8. The annual cost of operating DEAC is estimated to be \$150,000, which includes 0.5 person years of staff support.

9. The DFO or his/her delegatee shall be responsible for filings and other applicable statutory requirements of the Federal Advisory Committee Act.

#### DURATION

This charter shall terminate 12 months from the date of filing with the appropriate United States Senate and House of Representatives Oversight Committees, unless earlier terminated or renewed by proper authority. *Id.*

117. See ERA OF GLOBALIZATION, *supra* note 7; but see 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>.

118. 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>.

119. See ERA OF GLOBALIZATION, *supra* note 7 at 53.

120. Houghton, *supra* note 118.



components, and share assets in manufacturing, marketing, and distribution.<sup>121</sup> The ability of the system to distribute knowledge and ensure its delivery in a timely manner is critical in determining the success of its participants.<sup>122</sup>

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.<sup>123</sup> Deemed export rules at a basic level can significantly influence an organization's decision of who works on what research.<sup>124</sup> 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")<sup>125</sup> have a profound impact on both the economy and national security.<sup>126</sup> Although HPCS have military applications, other countries and foreign nationals working and studying throughout the United States and abroad produce HPCS as well.<sup>127</sup> Moreover, they have many commercial applications such as commercial aircraft design, ship performance analysis, commercial satellite design, and other non-military applications that continue to advance the overall technology curve.<sup>128</sup> A

121. *Id.*

122. *Id.*

123. See ERA OF GLOBALIZATION, *supra* note 7 at 53.

124. Letter from Christopher R. Calabrese, Counsel, Tech. & Liberty Program, and Barry Steinhardt, Dir., Tech. & Liberty Program to Matthew S. Borman, Deputy Assistant Sec'y for Export Admin., U.S. Dep't of Commerce (Jun. 27, 2005) (on file with author).

125. See Aad J. van der Steen, *Overview of Recent Supercomputers*, available at [http://www.nwo.nl/files.nsf/pages/NWOP\\_5V9EK7/\\$file/Overview\\_SC-AadvdSteen-2008.pdf](http://www.nwo.nl/files.nsf/pages/NWOP_5V9EK7/$file/Overview_SC-AadvdSteen-2008.pdf).

"HPCS" stands for High Productivity Computer Systems which is a program initiated by "DARPA," the U.S. Army Agency that provides large-scale financial support to future (sometimes futuristic) research that might benefit the U.S. Army in some way. The HPCS program was set up to ensure that by 2010 computer systems will exist that are capable of a performance of 1 Pflop/s in real applications as opposed to the Theoretical Peak Performance which might be much higher. Initially Cray, HP, IBM, SGI, and SUN participated in the program. After repeated evaluations, only Cray and IBM still get support from the HPCS program. *Id.*

126. 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](http://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. It identified significant military applications, including cryptology, battle management and target engagement, joint theater missile defense, information superiority, and electronic warfare. *Id.*

127. *Id.*

128. See Steen, *supra* note 125.

tough question emerges in light of HPCS applications in today's knowledge-driven economy: "Do deemed export restrictions on the use of HPCS by highly qualified foreign national students and workers in the United States protect national security, or do they simply inhibit innovation and harm the United States' position in the world economy?"<sup>129</sup>

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."<sup>130</sup>

### 1. *Findings 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 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."<sup>131</sup> In addition, the Advisory Committee explicitly rebuked the U.S. Department of State's recent policy proposal, which would permit access to ITAR export-controlled information to United States-educated foreign nationals who emigrate to a European Union or NATO country.<sup>132</sup> Under the proposal, such European Union nationals could join foreign companies and subsequently be considered authorized under an approved license or Technical Assistance Agreement.<sup>133</sup> The Advisory Committee found this policy to conflict with other

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129. ERA OF GLOBALIZATION, *supra* note 7 at 55. On December 10, 2003, the Bureau of Industry and Security amended the Export Administration Act to implement the December 2002 revisions to the Wassenaar List of Dual-Use Goods and Technologies. This regulatory update raised the composite theoretical performance ("CTP") control level for high performance computers from 28,000 millions of theoretical operations per second ("MTOPS") to 190,000 MTOPS. Now, the EAR allows exports and imports of computers with CTP not exceeding 190,000 MTOPS. For HPC licensing requirements to other destinations, refer to section 742.12 of the EAR. See Bureau of Indus. & Sec., U.S. Dep't of Commerce, Archive of HPC News Items, *available at* <http://www.bis.doc.gov/hpcs/archivednewsitems.html> (last visited on November 10, 2008).

130. ERA OF GLOBALIZATION, *supra* note 7 at 57.

131. 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).

132. ERA OF GLOBALIZATION, *Supra* note 7, at 59-60.

133. See *Export Controls: Are We Protecting Security and Facilitating Exports: Hearing before the Subcomm. on Terrorism, Nonproliferation and Trade of the H. Comm. on For-*

current United States export regulations since it assumes a homogeneous population in the European Union and NATO.<sup>134</sup>

To the contrary, many European Union and NATO countries regularly naturalize émigrés with advanced degrees in science and technology, which would thereby grant these people access, under the Department of State's proposal, to critical military knowledge and technology.<sup>135</sup> Such a scheme is inherently ironic and contradictory because while knowledge restrictions (deemed export licensing) would apply to a brilliant foreign national researcher seeking to advance the level of technology while studying within the United States, the same researcher would be allowed unrestricted access to the same or better technology as a naturalized citizen of a NATO or European Union country.<sup>136</sup>

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."<sup>137</sup>

## 2. *Advisory Committee Recommendations*

In finding that the current deemed export regulations possess a number of shortcomings, the Advisory Committee made two general recommendations,<sup>138</sup> as well as a seven-step decision-making construct.<sup>139</sup> The Advisory Committee's report depicts the construct graphically<sup>140</sup> 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.<sup>141</sup>

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 (universi-

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*eign Affairs*, 110th Cong. (2007) (statement of Stephen D. Mull, Assistant Sec'y of State for Political Military Affairs), available at <http://www.state.gov/t/pm/rls/rm/89520.htm>.

134. See ERA OF GLOBALIZATION, *supra* note 7 at 60.

135. *Id.*

136. *Id.*

137. *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).

138. See ERA OF GLOBALIZATION, *supra* note 7 at 85-7.

139. *Id.* at 90-4.

140. *Id.* at 89.

141. *Id.* at 85-8.

ties, industry, contractors).<sup>142</sup> The Advisory Committee first 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.<sup>143</sup> Additionally, 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),<sup>144</sup> BIS should extend its education outreach program to help assure that all parties potentially subject to licensing are familiar with the rules.<sup>145</sup> Only through a strengthened relationship can the deemed export regime begin to adequately address the issues of today’s globalized world.

*a. Implementing Actions*

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.”<sup>146</sup> 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)<sup>147</sup> of the list of technologies subject to the Commerce Control List.<sup>148</sup> 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.<sup>149</sup> Ultimately, those seeking to add or preserve items to the proscribed list would bear the burden of proof of showing necessity.<sup>150</sup>

Second, a category of “trusted entities” would voluntarily elect to qualify for special, streamlined treatment in the processing of deemed

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142. *Id.* at 9. 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.

143. *Id.* at 85.

144. 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).

145. See ERA OF GLOBALIZATION, *supra* note 7, 85.

146. *Id.*

147. Notice of Inquiry, 73 Fed. Reg. 28795 (Dep’t of Commerce May 19, 2008). 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.

148. See ERA OF GLOBALIZATION, *supra* note 7 at 86.

149. *Id.* at 91.

150. *Id.* at 87.

export license applications.<sup>151</sup> 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).<sup>152</sup> 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).<sup>153</sup>

Third, assessments of a foreign national's loyalty would be more thorough and comprehensive.<sup>154</sup> 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.<sup>155</sup> 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.<sup>156</sup>

Fourth, the current distinction drawn between the product of research and knowledge regarding the equipment exploited during the research is moot and irrelevant.<sup>157</sup> In order to avoid the long-enduring debate in defining "use" technology and its applicability to the deemed export regulations, BIS would need to 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.<sup>158</sup> A simpler and more determinative process would eliminate the "and/or" considerations currently applied in evaluating "use" exemptions to the deemed export regulations.<sup>159</sup> Absent the adoption of such a rule, the "and" provision in the current "use" definition should be narrowly interpreted to require all six activities.<sup>160</sup>

Fifth, a more conventional definition of "fundamental research" should replace the current definition that relies on the meaning of "ordinarily published" results.<sup>161</sup> Currently, the definition of "fundamental research" in the current export administration regulations is, "research

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151. *Id.* at 86.

152. *Id.* at 93.

153. *Id.* at 86.

154. ERA OF GLOBALIZATION, *supra* note 7 at 86.

155. *Id.*

156. *Id.*

157. *Id.* at 87.

158. *Id.* at 88.

159. *Id.* at 87.

160. ERA OF GLOBALIZATION, *supra* note 7 at 88.

161. *Id.* at 87.

where the resulting information is ordinarily published and shared broadly within the scientific community.”<sup>162</sup> The new definition of fundamental research would eliminate such reliance on the circular meaning of “ordinarily published” by excluding “curiosity-driven research seeking new knowledge.”<sup>163</sup> Absent the adoption of the simpler and more determinative definitions, the current fundamental research provisions should remain unchanged.

Sixth, the Advisory Committee suggested increasing the use of interactive, web-based self-teaching programs to those subject to deemed export regulations.<sup>164</sup> This effort would emphasize self-compliance in academic and industry research environments by clearly laying out the requirements of the deemed export rule.

*b. Deemed Export Decision-Making Construct*

In addition to its general recommendations and implementing actions, the Advisory Committee proposed a decision construct, depicted graphically and consisting of seven steps.<sup>165</sup> These steps incorporate and expound upon the Advisory Committee’s implementation actions. In brief, the steps include:

1. Assess the probable loyalty of individual;
2. Determine whether information is classified;
3. Determine whether military application of the knowledge is substantive and truly significant (“high walls around small fields”);
4. Determine whether knowledge is readily available from non-United States sources;
5. Determine whether activity is fundamental research (possible definitional change);
6. Determine if organization is a Trusted Entity;
7. Determine risk/benefits of any remaining adverse consequences to releasing the information.<sup>166</sup>

At step one, the applying organization would provide the names and relevant information concerning individual applicants to the government for review.<sup>167</sup> As previously mentioned in the committee’s third implementing act, assessing probable loyalty, the government would review the applicant’s prior and present activities, prior countries of residence,

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162. 15 C.F.R. § 734.8; ERA OF GLOBALIZATION, *supra* note 7, at 92.

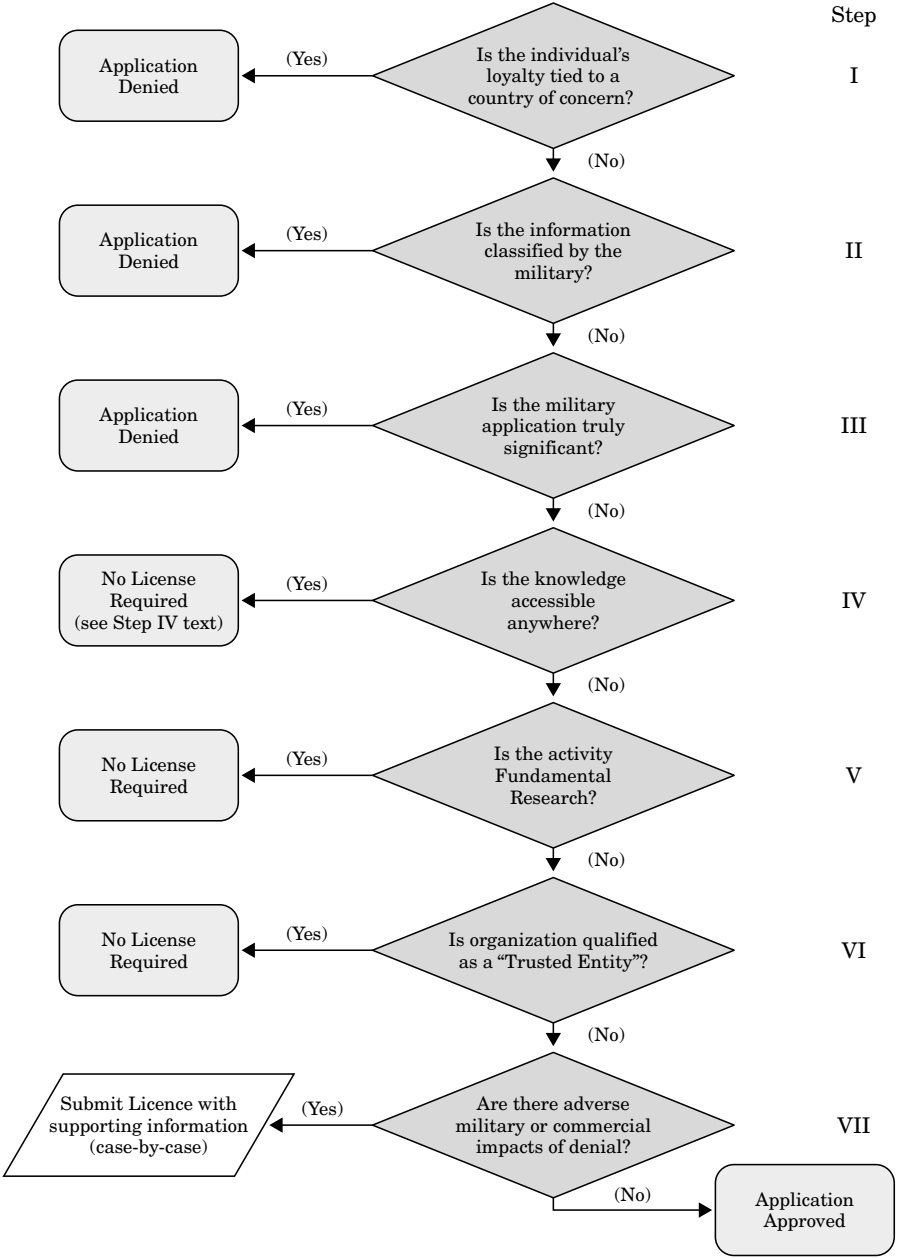
163. ERA OF GLOBALIZATION, *supra* note 7, at 9.

164. *See Id.*

165. *Id.* at 89. As depicted, the seven steps are sequential, each requiring a “no” answer in order to progress to the next step. A “yes” answer at any step has three different outcomes, “application denied,” “no license required,” or “case-by-case basis.”

166. *Id.*

167. *Id.* at 90.



and other sensitive details to determine whether the individual would pose a security risk.<sup>168</sup> Presumably, such a risk would involve a tie between the individual and a country on the United States government's proscribed list (generally terrorist-supporting) or other significant loyalty concern.<sup>169</sup> If the government is satisfied that the licensee is not a security risk based on probable loyalty to a country of concern, licensing assessment proceeds to step two.

Step two incorporates the most powerful factor in determining controls on access to technology – security classification. The government will rarely accept an application for classified information, and will only accept the application in highly exceptional situations as determined by the government because of the sensitive implications of the knowledge on national security.<sup>170</sup> If the information is not classified, however, the assessment proceeds to step three. Even if the information and knowledge is not classified, it may have military applications that can still pose a threat to homeland security.<sup>171</sup> As suggested before, the approach “is to build high walls around small fields rather than, as is present practice, nominal walls around large fields.”<sup>172</sup> Therefore, step three requires a determination “whether the military application of the knowledge in questions is both substantive and truly significant to the nation.”<sup>173</sup> The government would reject applications for technology with truly significant consequences for national security, but the applications would subsequently be included on the list for review by the expert panel in its annual zero-based review of the Commerce Control List.<sup>174</sup>

If the technology is not classified and does not have substantive or truly significant military applications, assessment proceeds to step four. Step four requires a determination whether the knowledge being assessed is readily available outside of the United States.<sup>175</sup> Technology or knowledge that is the equivalent to that sought for licensing and which is readily available from other sources outside of the United States would not require a license.<sup>176</sup> Nonetheless, the United States may still decide to subject the technology to licensing requirements where it de-

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168. *Id.* at 86.

169. ERA OF GLOBALIZATION, *supra* note 7, at 90.

170. *Id.*

171. *Id.* at 91. Critical aspects of those few technologies that could produce truly major threats “(for example, certain aspects of nuclear weapon related technology, toxic biological agents, chemical warfare related agents, cryptography – and perhaps a few contemporary, pivotal technological breakthroughs – such as night vision, stealth, advanced composites and electronic countermeasures.)”

172. *Id.* (Internal quotations omitted.)

173. *Id.*

174. *Id.*

175. ERA OF GLOBALIZATION, *supra* note 7 at 91.

176. *Id.*



cides, as a matter of principle, to refuse to assist an individual even though that individual can gain such assistance elsewhere.<sup>177</sup> This exception would be extremely rare.

At step five, an assessment is made whether the activity at hand constitutes fundamental research, therefore removing it from the purview of deemed export licensing requirements.<sup>178</sup> As the Advisory Committee suggested earlier, the more conventional definition of "fundamental research"<sup>179</sup> – "curiosity-driven research seeking new knowledge"<sup>180</sup> – would replace the current definition. Alternatively, deemed export licensing requirements would exclude research if it "is not precluded from publication in the relevant contractual documents or other regulatory mechanisms."<sup>181</sup>

Step six hinges on the creation of "trusted entities," and whether the applicant qualifies as such. It is important to note, however, that classified or sensitive military knowledge would never progress to the point of consideration for qualification as a trusted entity.<sup>182</sup> While previous discussion sets forth the benefits of maintaining these organizations, qualification as such an organization would require a number of criteria.<sup>183</sup> First, the organization must demonstrate a history of responsible conduct with regard to export control matters and conduct a training program for its employees to ensure compliance with the deemed export regulations.<sup>184</sup> Second, the organization would self-process its licensing needs, taking into account input or guidance from the government when appropriate and report periodically on its licensing activities.<sup>185</sup> This would include disclosure of all persons receiving controlled information. Third, the organization must immediately report any violations it is aware of to the government and permit annual government audits for requalification.<sup>186</sup> If an organization, industrial or academic, qualifies as a trusted entity, "it can make a self-determination of the appropriateness of the proposed transfer action<sup>187</sup> by implementing the seven step

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177. *Id.* at 92.

178. *Id.*

179. 15 C.F.R. § 734.8; ERA OF GLOBALIZATION, *supra* note 7 at 92. "Research where the resulting information is ordinarily published and shared broadly within the scientific community." 15 C.F.R. § 734.8.

180. ERA OF GLOBALIZATION, *supra* note 7 at 92.

181. *Id.* at 93.

182. *Id.* at 92.

183. *Id.* at 93.

184. *Id.*

185. *Id.*

186. ERA OF GLOBALIZATION, *supra* note 7 at 93.

187. However, the implementation of this recommendation remains rather ambiguous and is unclear from the Report.

process.”<sup>188</sup>

Lastly, step seven requires a safety-net assessment of whether the remaining military, commercial, or political concerns outweigh the benefits of the proposed release.<sup>189</sup> Although very few cases will reach this step, it remains important to allow considerations of “those extraordinary cases that may simply not be addressable by rules intended for the ordinary course of business.”<sup>190</sup> A case-by-case analysis will make the determinations, judging on the merits, considering the abovementioned factors.<sup>191</sup>

V. 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.<sup>192</sup> With great enthusiasm, the scientific and research communities have applauded this recommendation. Nonetheless, despite overwhelming support for such recommendations, a number of issues remain.

The Association of American Universities-Council on Governmental Relations<sup>193</sup> and numerous companies worry that the Advisory Committee's recommendation to expand the determination of national affiliation

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188. ERA OF GLOBALIZATION, *supra* note 7 at 93.

189. *Id.* at 94.

190. *Id.*

191. *Id.*

192. DeCrappeo, *supra* note 137. “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.*

193. 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, <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.

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.<sup>194</sup> 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 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.<sup>195</sup> 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.<sup>196</sup> 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.<sup>197</sup>

#### A. BASING LICENSE DECISIONS ON THE "PROBABLE LOYALTIES" OF POTENTIAL TECHNOLOGY RECIPIENTS IS AN INADMINISTRABLE 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

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194. DeCrappeo, *supra* note 137.

195. See Notice of Inquiry, 73 Fed. Reg. 28795 (Dep't of Commerce May 19, 2008).

196. *Id.*

197. *Id.*

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 diversion of export-controlled technology by the foreign national.<sup>198</sup> 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.<sup>199</sup>

Further, the Advisory Committee stated there is no adequate distinction for a foreign national residing in a specific country for the majority of his or her lifetime who subsequently moves to a new country. 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.<sup>200</sup> 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 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

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198. See ERA OF GLOBALIZATION, *supra* note 7, at 17.

199. *Id.*

200. *Id.* at 19.

burdensome compliance risks, while resulting in a procedurally problematic and expensive divergence from current and accepted employment and technology access practices.<sup>201</sup> 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 and engineers is increasing.<sup>202</sup> The Board's data show that the percent of foreign-born national science and engineering workers rose from 14% to 22% from 1990-2000.<sup>203</sup> The largest increase (as a subcategory of this trend) was for doctorate holders, which rose from 24% to 38% in important science and technology specialties.<sup>204</sup> 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.<sup>205</sup> One-third of this group came from India, China, or the Philippines.<sup>206</sup> Among science and engineering doctorate holders working in the United States, one-third of this total group came from India and China.<sup>207</sup>

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, for-

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201. "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).

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

203. *Id.*

204. *Id.*

205. *Id.*

206. *Id.*

207. *Id.*

eign 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.<sup>208</sup> Within that subset, more than half of the foreign national degrees (approximately 4,400) earned were in engineering fields of study.<sup>209</sup> Of the remainder, foreign nationals earned 44% of mathematical and computer science doctorates, and foreign nationals earned 35% of the physical science doctorates.<sup>210</sup> These precautions are unnecessary because businesses already protect their valuable technologies by maintaining a number of internal controls and 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, to evaluate its potential significance. General Electric estimates that maintaining a system of 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.<sup>211</sup>

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

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208. NAT'L SCIENCE BOARD, *supra* note 202.

209. *Id.*

210. *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.

211. *See* Palma, *supra* note 201.

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.<sup>212</sup> Expecting campuses to determine the potential loyalties and affiliations of its foreign students, beyond their citizenship, is an unreasonable burden and a poor means by which to ensure national security.<sup>213</sup> 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."<sup>214</sup> 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.<sup>215</sup> 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.<sup>216</sup>

Imparting a "knowledge" standard into determinations of loyalty also reflects the findings of the Advisory Committee regarding foreign collection efforts.<sup>217</sup>

The current deemed export rule is premised on a legal fiction that domestic transfers of technical knowledge and information with non-U.S.

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212. See DeCrappeo, *supra* note 137.

213. *Id.*

214. *Id.*

215. *Id.*

216. *Id.*

217. See ERA OF GLOBALIZATION, *supra* note 7 at 70-3. This standard was the applicable rule for determining deemed exports prior to 1994. See 15 C.F.R. § 779.1(b)(1) (1993).

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 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.”<sup>218</sup> Although a record number of 108 countries were involved in collection efforts against sensitive and protected United States technologies,<sup>219</sup> only a small number of countries, including China and Russia, accounted for much of the targeting.<sup>220</sup>

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.<sup>221</sup>

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218. 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>.

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

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

221. “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.*



According to the Espionage report, the “spy” could be just about anyone, including a United States citizen.<sup>222</sup> 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 Espionage Report observed, it would not address the issue of corporate espionage cases involving United States citizens or legal permanent residents.

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.<sup>223</sup> 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 (“ETRAC”), on May 23, 2008, because of public comments submitted to it in 2007 regarding the CCL, the Advisory Committee’s Final Report, and a Presidential directive<sup>224</sup> calling for BIS to regularly reassess and update the CCL.<sup>225</sup> ETRAC is a technical advisory committee established under the terms of the Export Administration Act, International Emergency Economic Powers Enhancement Act,

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222. *Id.*

223. ERA OF GLOBALIZATION, *supra* note 7 at 21-2.

224. 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](http://www.bis.doc.gov/pdf/nspd_fact_sheet_1-16-2008.pdf). 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 re-export of sensitive items while minimizing their impact on United States economic competitiveness and innovation. *Id.*

225. See press release, Bureau of Indus. & Sec., U.S. Dep’t of Commerce, BIS Establishes Emerging Technology and Research Advisory Committee (May 23, 2008), available at [http://www.bis.doc.gov/news/2008/etrac\\_release05232008.htm](http://www.bis.doc.gov/news/2008/etrac_release05232008.htm).

and Federal Advisory Committee Act, and comprises representatives from research universities, government research labs, and industry.<sup>226</sup> The ETRAC makes recommendations to BIS regarding emerging technologies on a regular basis as well as advises BIS on the conduct of a “zero-based” technology review envisioned by the Advisory Committee.<sup>227</sup> 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 consequently the United States cannot unilaterally change them. Deemed export licensing requirements, however, 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 a high enough risk to have specific deemed export requirements.<sup>228</sup> Items controlled by the proliferation regimes represent a relatively small subset of those currently caught by deemed

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226. *See Id.* Members were appointed to the ETRAC on Tuesday, September 23, 2008 and include: Pamela Abshire, University of Maryland; Maja Mataric, University of Southern California; Jeffrey Ashe, General Electric Global Research; Richard McCullough, Carnegie Mellon University; Robert Breault, Breault Research Organization, Inc.; Steven Patterson, Lawrence Livermore National Lab.; Claude Canizares, Massachusetts Institute of Technology; Carl A. Picconatto, MITRE Experimental Laboratory; A. Stephen Dahms, Alfred E. Mann Foundation; Jeffrey Puschell, Raytheon Space & Airborne Systems; Charbel Farhat, Stanford University; Jeffrey Reed, Virginia Tech; Bob Gleichauf, Cisco Systems; Michael Reiter, University of North Carolina; Harry Kington, Honeywell Aerospace; Samuel Stanley, Jr, Washington University; Gerald Kulcinski, University of Wisconsin; Marlin Thomas, Air Force Institute of Technology; Brooks Keel, Louisiana State University; Thomas E. Tierney IV, Los Alamos National Laboratory; Nikolai Leung, Qualcomm, Inc.; James Tour, Rice University; Seth R. Marder, Georgia Institute of Technology. *Id.*

227. *See* Notice of Inquiry, 73 Fed. Reg. 28795 (Dep’t of Commerce May 19, 2008), available at [wais.access.gpo.gov](http://wais.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).

228. *See, e.g.,* DeCrappeo, *supra* note 137; Palma, *supra* note 201; Letter from Jeff Ritener, 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).

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.<sup>229</sup> In order to level the playing field for United States companies and universities using these items, the government should make an effort to “multi-lateralize” 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 the sole, determining factor as to whether an item remains on the control list.

C. “SENSITIVE BUT UNCLASSIFIED” CLAUSES IN GOVERNMENT  
CONTRACTS IMPROPERLY RESTRICT PUBLICATION AND THE  
INVOLVEMENT OF FOREIGN NATIONALS IN  
UNIVERSITY RESEARCH CONTRARY TO THE  
STATED POLICY OF NSDD-189

A survey of twenty institutions conducted in 2003-2004 under the auspices of the Association of American Universities and the Council on Governmental Relations found 138 attempts by the government to restrict the publication of data or foreign-national participation in research.<sup>230</sup> Anecdotal information presented at the regional meetings

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229. See Wassenaar Arrangement, *supra*, note 14. The Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies, is one of four multilateral export control regimes in which the United States participates. The Arrangement's purpose is to contribute to regional and international security and stability by promoting transparency and greater responsibility in transfers of conventional arms and dual-use (i.e. those having civil and military uses) goods and technologies to prevent destabilizing accumulations of those items.

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. In addition, the Wassenaar Arrangement imposes some reporting requirements on its member governments. The U.S. Government controls all items for export that the Wassenaar Arrangement controls multilaterally. In general, the U.S. Department of Commerce administers export controls for dual-use goods and technologies controlled in the Wassenaar Arrangement and controlled for national security reasons on the Commerce Control List and the U.S. Department of State administers export controls on conventional arms. *Id.*

230. See NAT'L RESEARCH COUNCIL, *supra* note 10. The National Academy of Sciences is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. Upon the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal govern-

indicates that inappropriate restrictions are continuing to be included in research awards; however, it is unknown whether the number and frequency of such restrictions are changing.<sup>231</sup> The University of California – Berkeley reports that U.C. campuses “have turned down millions of dollars in government contracts,” because of restrictions on publication.<sup>232</sup>

Although there have been instances of the inclusion of publication and access restrictions in assistance awards (grants and cooperative agreements), the far greater problem for universities has been in the procurement (contracts) area. Contracting officers and universities sometimes do not recognize that the fundamental principles as well as much of the wording of NSDD-189 are incorporated into the Federal Acquisition Regulations.<sup>233</sup> The problem for universities is that federal agencies sometimes impose restrictions on publications or foreign nationals in their research contracts to universities when the research complies with the requirements of NSDD-189. More difficult for universities is the fact that federal agencies award research contracts to industrial firms without the fundamental research exclusion (which is appropriate), but do not consider that the sub-recipient who will help perform the work may

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ment on scientific and technical matters. The House Committee on Science and Technology asked the National Academies to organize regional meetings on university campuses to gain a better understanding of whether concerns about our country’s need to protect itself from terrorist threats had resulted in policy changes that were altering our ability to attract the best and brightest scientists and engineers and to undertake and conduct leading-edge research. *Id.*

231. *Id.* (recommending that by implementing new security measures the United States must be cognizant that, in a context of increasing globalization and competition, policies that consider only a desire for protection through additional restrictions and controls could have adverse effects on economic growth, international competitiveness, and even long-term aspects of national security if they are not properly balanced with the need for open communication and collaboration on the part of scientists and engineers. In addition, although beyond its charge, the committee recognized that the unknowable nature of when, where, and what the next threat will be requires that the United States continue to rely on a broad-based talent pool as well as fundamental, long-term research programs. Important advances from long-term research are critical to meeting the challenge of future technological threats and human health concerns, and thus such research must receive substantial federal support.).

232. Barry Bergman, *Research under fire: In the War on Terror, Academic Freedom Could Wind Up as Collateral Damage*, BERKELEYAN, January 15, 2005, available at [http://berkeley.edu/news/berkeleyan/2005/01/27\\_acfreedom.shtml](http://berkeley.edu/news/berkeleyan/2005/01/27_acfreedom.shtml).

233. See F.A.R. 27.404(g)(2). The Federal Acquisition Regulation (“FAR”) governs all Federal Executive agencies in their acquisition of supplies and services with appropriated funds. The FAR precludes agency acquisition regulations that unnecessarily repeat, paraphrase, or otherwise restate the FAR, limits agency acquisition regulations to those necessary to implement FAR policies and procedures within an agency, and provides for coordination, simplicity, and uniformity in the federal acquisition process. It also provides for agency and public participation in developing the FAR and agency acquisition regulation. *Id.*

be a university for which the restrictions are not appropriate. The industrial prime may be reluctant, or unable, to secure sponsor approval to remove the requirement from their subcontracts to universities.

In the months following the September 11 attacks, the Bush administration reaffirmed the intent of NSDD-189. Then Assistant to the President for National Security Affairs, Condoleezza Rice, confirmed that "the policy on the transfer of scientific, technical, and engineering information set forth in NSDD-189 shall remain in effect, and we will ensure that this policy is followed."<sup>234</sup> Nonetheless, concerned about an erosion of the protections to fundamental research offered by NSDD-189, in 2002 the presidents of the National Academies issued a statement calling upon the government to affirm and maintain the general principle of NSDD-189:

A successful balance between these two needs—security and openness—demands clarity in the distinctions between classified and unclassified research. We believe it to be essential that these distinctions not include poorly defined categories of 'sensitive but unclassified' information that do not provide precise guidance on what information should be restricted from public access. Experience shows that vague criteria of this kind generate deep uncertainties among both scientists and officials responsible for enforcing regulations. The inevitable effect is to stifle scientific creativity and to weaken national security.<sup>235</sup>

A report entitled, *Security Controls on Scientific Information and the Conduct of Scientific Research*, by the Center for Strategic and International Studies warned that the creeping nature of these controls creates ambiguity, results in discrimination, and generates delays and inflexibility that can hinder discoveries and scare away talent.<sup>236</sup> The report noted that the security benefits of such policies are modest when weighed against the risks of such policies to United States technological leadership.<sup>237</sup>

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234. Letter from Condoleezza Rice, U.S. Nat'l Sec. Advisor, to Harold Brown, Co-Chairman, Ctr. for Strategic and Int'l Studies (Nov. 1, 2001), *available at* [www.fas.org/sgp/bush/cr110101.html](http://www.fas.org/sgp/bush/cr110101.html).

235. Bruce Alberts, Harvey Fineberg, & William A. Wulf, Presidents of the Nat'l Academies, Statements on Science and Security in an Age of Terrorism (October 18, 2002), *available at* [www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=s10182002b](http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=s10182002b).

236. See Homeland Sec. Program, Ctr. for Strategic and Int'l Studies, *Security Controls on Scientific Information and the Conduct of Scientific Research* (2005), *available at* [http://www.csis.org/media/csis/pubs/0506\\_cscans.pdf](http://www.csis.org/media/csis/pubs/0506_cscans.pdf) (asserting that an open scientific environment provides for the greatest security of the United States).

237. *Id.*

## VI. 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 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.<sup>238</sup>

In concert with this rationale, 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.<sup>239</sup> 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 States*, puts this reliance in the following perspective:

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238. AM. COMPETITIVE INITIATIVE, DOMESTIC POL'Y COUNCIL, OFFICE OF SCI. & TECHNOLOGY POL'Y, THE WHITE HOUSE 1 (2006), *available at* <http://www.whitehouse.gov/state-oftheunion/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.*

239. *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>. 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. *Id.*

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.<sup>240</sup>

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 a Ph.D. from United States universities.<sup>241</sup> 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 Indian being the predominant ethnic group leading these startups in the second five years of the study.<sup>242</sup> Some of these companies started with venture funding and now employ tens of thousands of United States workers.<sup>243</sup>

Any impact on restricting foreign nationals' ability to engage in unclassified fundamental research could have a devastating impact on 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

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240. See NAT'L ACADEMIES, POL'Y IMPLICATIONS OF INT'L GRADUATE STUDENTS AND POST-DOCTORAL SCHOLARS IN THE U.S. (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). The National Academies is the same institution responsible for drafting the Corson Report in 1982. *Id.*

241. 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>.

242. Mark Lavender, *Skilled, Educated Immigrants Contribute Significantly to United States Economy*, DUKE U. NEWS & COMM., January 3, 2007, available at <http://www.duke.news.duke.edu/2007/01/engineerstudy.html>.

243. See ANDERSON STUART AND MICHAELA PLATZER, NATIONAL VENTURE CAPITAL ASSOCIATION, AMERICAN MADE: THE IMPACT OF IMMIGRANT ENTREPRENEURS AND PROFESSIONALS ON UNITED STATES COMPETITIVENESS 14 (2006), available at [http://www.nvca.org/pdf/AmericanMade\\_study.pdf](http://www.nvca.org/pdf/AmericanMade_study.pdf).

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 particular individual will export controlled technology for the purpose of doing harm to the U.S. Assessing "loyalty" is too vague and subjective a term to be meaningful. Moreover, tracing an individual's place of residence, from birthplace to current country of citizenship is a difficult task that would require resources beyond any universities' capabilities. 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 "intra-company" 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-

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

<b>Company</b>	<b>Immigrant Founder or Co-founder</b>	<b>Country of Birth</b>	<b>Number of Employees (FY2005)</b>	<b>Industry</b>
Intel Corp.	Andy Grove	Hungary	99,900	Semiconductor & related manufacturing
Sollectron 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



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 efficient 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 vital to strategic effectiveness, credibility, and compliance clarity. For example, despite the common notion that "nanotechnology" means "cutting edge," it is a term covering a huge array of techniques now used in products including textiles, cosmetics, and shampoos, areas that clearly should not be restricted.<sup>244</sup> Another illustration is that many computer encryption technologies that emerged a few years ago and that contain rarified knowledge are now internationally publicly available and existing export control numbers may not adequately define the latest encryption technologies today.

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244. See Jamie Joiner, *Dual-Use Export Controls on Nanotechnology*, 5 NA-NOTECHNOLOGY L. & BUS. 1 (2008).

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; and 2) that 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 that cannot be controlled more appropriately by classification should be controlled as deemed exports. If information about a particular technology is reasonably available and can be readily 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 other similarly narrow subsets of the items controlled for nuclear, missile, chemical/biological, and other reasons. The approach should be to "multi-lateralize" 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.

Lastly, government contracts with universities that contain limitations on publication rights and the inclusion of foreign nationals in research erode the principal exclusions found in NSDD-189. To illustrate the problem, a situation exploring the dilemma faced by the scientific and security communities regarding openness in research is helpful. First, the publication of research on pathogens could provide terrorists with recipes for their production, enabling an attack that could endanger the U.S. population. Consequently, one reaction might be to restrict such publications. Yet a considerable amount of this research is performed outside the United States and is already available to those who might misuse the information. Given such a situation, it is possible that an attack enabled by advanced research could occur in the coming years even if the United States were to impose restrictions on the publication of such information. Moreover, a failure to publish information might inhibit the development of the capability to treat those affected and prevent the spread of any resulting diseases. Open and rapid publication, rather than restrictions on publication, facilitates the rapid development

of understanding on the part of researchers studying the pathogens. In addition to recognizing that NSDD-189 is incorporated into the Federal Acquisition Regulation, it is important that federal regulations such as the EAR and ITAR be made consistent with NSDD-189.<sup>245</sup>

## VII. 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 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 pool. In this competitive environment, U.S. government policies placing barriers on the hiring, deployment, and utilization of foreign nationals should be narrowly crafted to clearly and effectively address specific policy objectives without excessively and inappropriately burdening industry.

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245. See NAT'L RESEARCH COUNCIL, *supra* note 10.