

**Comments on the Proposed Revision and Clarification of Deemed
Export Related Regulatory Requirements
*RIN 0694-AD29***

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The Computing Research Association (CRA) is an association of more than 200 North American academic departments of computer science, computer engineering, and related fields; laboratories and centers in industry, government, and academia engaging in basic computing research; and affiliated professional societies. CRA's mission is to strengthen research and advanced education in the computing fields, expand opportunities for women and minorities, and improve public and policymaker understanding of the importance of computing and computing research in our society.

We write out of concern regarding the proposed rule changes to the deemed export regulations affecting the Bureau of Industry and Security at the Department of Commerce. The members of the scientific and technical communities stand as partners with the federal government in increasing homeland security and ensuring America's continued economic strength. Unfortunately, the proposed rule changes would have real and lasting impacts on America's ability to continue to be a world leader in computer science and engineering and would have significant negative consequences for national security.

Economists, business leaders, policymakers, and scientists all agree that there is an inexorable connection between America's ability to innovate and our continued economic and security strength. As then-National Security Advisor Condoleezza Rice wrote in November 2001:

The key to maintaining US technological preeminence is to encourage open and collaborative basic research. The linkage between the free exchange of ideas and scientific innovation, prosperity, and national security is undeniable.

In order to protect America's economic might and homeland security, then, it is vital that we maintain a research environment that is welcoming to the world's best and brightest scientists and engineers while, so far as is reasonably possible, eschewing the shackles of unnecessary and costly regulation. The US benefits when we maintain a research environment that welcomes members of the world scientific community to conduct their basic and applied research in our labs and universities. However, this research environment is not a given and must be encouraged by sound public policy. CRA

believes that the regulatory changes proposed by the BIS will have significant negative net impacts on America's ability to lead the world in technological innovation and that we will suffer negative effects – both economic and security-wise – as a result.

Since the attacks of September 11, 2001, the United States has erected a number of barriers to foreign nationals who desire to come to the US for study, to teach, or to conduct research. Certainly, many of these regulatory changes were important to securing the homeland against terrorism and to ensuring that individuals on academic visas were indeed pursuing academic studies, teaching, or research, as the Student and Exchange Visitor Information System (SEVIS) program has been designed to monitor. However, we run the risk of going too far in pursuit of border security that we permanently hobble America's competitiveness and ability to innovate.

In December 2002, the presidents of the three National Academies released a joint statement arguing, “[R]ecent efforts by our government to constrain the flow of international visitors in the name of national security are having serious unintended consequences for American science, engineering, and medicine.”¹ CRA believes that the proposed regulatory changes regarding deemed exports will have similar deleterious effects to the changes in visa policy, but without any substantial benefits.

The scientific research community is increasingly globalized, and the countries that will benefit the most from innovation in the coming years will be the countries that recognize this and regulate accordingly; they must make their resources – human and physical – available to researchers worldwide, encourage scientific publications and conferences, and cultivate successive generations of highly-skilled scientists and engineers. The proposed regulatory changes will make America less competitive in the globalized scientific environment while providing no additional protection against improper transfer of sensitive information.

In particular, CRA wishes to offer five critiques of the proposed rule changes and to explain how these will do serious harm to the ability of our members to continue producing cutting-edge fundamental research and producing tomorrow's leaders in scientific innovation.

1) The proposed rule changes will contribute to a perceived atmosphere of hostility towards foreign researchers and students.

- **Country of birth is not a just criterion for evaluating individuals.** It has long been a point of pride in America that accident of birth is not a criterion for judging the fitness of an individual for any position or post, with few exceptions, most notably the Presidency of the United States. Race, gender, and country of origin are immutable characteristics over which an individual has no control; as a

¹ Bruce Alberts, Wm. A. Wulf, and Harvey Feinberg, “Current Visa Restrictions Interfere with the US Science and Engineering Contributions to Important National Needs,” 13 December 2002, revised 13 June 2003.

result, it is widely presumed in democratic societies that these are not valid means of assessing the character of the individual. It has long been held that individuals hold allegiance to their country of citizenship, not birth. As a result, country of birth is widely viewed as an unjust criterion for judging an individual's fitness for any privilege. Personal behavior and chosen associations should count for much more than aspects of biography over which an individual has no control whatsoever.

Significantly, the burden of enforcement of the proposed rules will fall upon research labs and institutions, which will be required to create castes within citizenships. For instance, two German citizens working in the same lab might be subject to different regulations simply because one was born in Albania while the other was born in France. A fundamental premise of democracy is that all citizens are afforded the same rights and responsibilities as their fellow citizens both at home and abroad, but the proposed regulations would disregard this principle, and scientists and their institutions would be responsible for enforcement. This would have lasting deleterious impacts on American scientific prestige abroad and would significantly injure America's leadership in the scientific research community.

- **As a result, this will hurt American competitiveness and American security.** A significant part of America's computing research base and many thousands of graduate students in computer science would be affected by these rule changes and could choose, as a result, to return to their home countries or third countries for their graduate education and research. It has already been widely recognized that changes to visa policies since September 11, 2001 have caused a significant decline in the number of foreign scientists, engineers, and graduate students working in the United States.² The OIG proposals would send a clear message to foreign scientists and students: you may not use state-of-the-art technologies if you come to the United States, and if you come you will be relegated to second-class status. Regardless of the intent of the proposal, this is the way that it will inevitably be viewed by many of the people to whom America must be seen as an attractive place to study, research, teach, invest, and do business.

When we turn away the best and the brightest from our shores, we not only damage our industrial competitiveness, but forego the many security benefits of having highly educated foreigners study and work in America. When scientists work across national boundaries, they forge human capital links that build ties that are vital to America's national security. Foreigners who have worked in America and had positive experiences will export pro-American sentiments and serve as ambassadors of American goodwill in their home countries. Treating every foreign scientist or student with suspicion based on place of birth will only serve to damage the reputation of America abroad and will hinder the

² The American Immigration Law Forum found that "F-1 visas for students fell by 26.5 percent and H-1Bs for highly skilled professionals by 33.7 percent from FY2000 to FY2003." ("Maintaining a Competitive Edge: The Role of the Foreign-Born and US Immigration Policies in Science and Engineering," *Immigration Policy In Focus* 3(3), August 2004, pg. 15.)

understanding between educated classes that is vital to America's long term economic and security interests.

Because of the decline in graduate students in computer science and other technical fields, the United States is economically dependent upon foreign graduate students to provide the research muscle that is behind the technical innovations that lead to economic growth and provide the backbone of our high-tech homeland security initiatives. Without these foreign graduate students, the American well of knowledge will be significantly depleted. As then-NASA administrator Daniel Golden quipped in 2001, "We're fishing the pond. We're not restocking it."³

2) The proposed rule changes will only serve to increase confusion.

The OIG report made clear that even visual access to technologies subject to EAR restrictions is considered "use" by arguing, "a foreign guest researcher does not technically have to 'use' the machine for a transfer of the controlled technology to take place."⁴ Under this definition, students and visiting scholars from (or born in) countries in Groups D and E must be prohibited from even viewing any technologies that require a license for export because a mere visual inspection may allow a technology transfer to take place. We are concerned, in light of the critiques of the NIST and NOAA labs in the OIG report, that the proposed definitional change contextually interprets the word "use" so broadly that it loses any real meaning.

Additionally, the words explicating the definition of "use" remain ambiguous in their meanings. Maintenance, for instance, could mean nothing more than a visual inspection of a machine from a distance in order to assess if it was currently powered up or down. Even this simple chore could be forbidden to an undergraduate research assistant under regulations that, despite the proposed changes, will continue to be vague. Moreover, many colleges and universities depend upon student employees to fulfill important helpdesk and lab maintenance functions, many of which are relatively uninvolved. This regulation could have the effect of banning students born in Group D or E countries from working in the technical support environment.

Because of the prosaic nature of many of these technologies at many research universities, the logical endpoint of the OIG's definitions would require a license for every instance of restricted technology for every relevant individual. For a campus with 200 technologies subject to EAR and 5,000 students or scholars born

³ "Professor Romer Goes to Washington," *Wall Street Journal*, 25 January 2001.

⁴ US Department of Commerce Office of Inspector General, "Deemed Export Controls May Not Stop the Transfer of Sensitive Technology to Foreign Nations in the US," Final Inspection Report IPE-16176, March 2004, pg. 31.

in or residents of relevant countries, a strict interpretation of this policy could require the university to file a million EAR applications.

3) The proposed rule changes are an unfunded mandate with unstudied costs.

- **This creates significant costs for both the BIS and research institutions.** According to the OIG, in FY 2003 only 846 applications were filed for deemed exports.⁵ The expanded definition of “use” suggested by the OIG, combined with the elimination of two key fundamental research exemptions, would require a massive increase in the number of applications filed, potentially by orders of magnitude. A strict interpretation of the new policy, combined with the elimination of the fundamental research exemption for research subject to institutional review before dissemination and publication, will impose massive compliance costs on all organizations pursuing basic research as well as the Department of Commerce.

The Student and Exchange Visitor Information System (SEVIS), which was mandated by Congress in 2002 to monitor the visa status of foreign nationals studying, researching, or teaching in American colleges and universities, has already shifted a large financial burden from the Department of Homeland Security to educational institutions. The proposed rule change, which would require tracking country of birth as well as nationality, would impose additional burdens on research institutions and our member departments.

- **The effects of the proposed rule change would be wide-ranging and affect untold numbers of institutions and individuals.** In 2001, fully 23 percent of doctorate-level scientists working in computer and information sciences in the United States were non-US citizens, of whom 26 percent enjoy only temporary resident status.⁶ Additionally, in 2001, 32 percent of graduate students in science and engineering in the US, including 52,196 computer science graduate students, were not US citizens.⁷ Many of these scientists and students hail from Group D countries, particularly India and China. American industry and the government are highly dependent upon the work performed by these students and scholars in fundamental research that leads to development in fields as varied as information security, weapons systems, and manufacturing technologies.

The revised regulations would not just affect a few isolated individuals, but would have inestimable effects on the ability of industry, government, and academe to attract the best and the brightest to do their research in the United States. The costs that will accrue to the private and public sectors have not been properly

⁵ Department of Commerce (2004), pg. i.

⁶ National Science Foundation, Division of Science Resources Statistics, *Doctoral Scientists and Engineers: 2001 Profile Tables*, NSF 04-312, Project Officer, Kelly H. Kang, 2004.

⁷ National Science Foundation, InfoBrief 03-315, April 2003, online at <<http://www.nsf.gov/sbe/srs/infbrief/nsf03315/start.htm>>.

analyzed, but the harms both in terms of bureaucratic waste and opportunity cost are likely to be tremendous.

- **This does not pass a benefit-cost analysis.** The OIG’s report fails to demonstrate any real protections that these recommendations would create, but the costs are many, varied, and potentially substantial. Indeed, accepting the OIG recommendations may make America less safe, as they would lead us to believe we have improved our security when in fact we have not made any real enhancements. Moreover, they would reduce America’s ability to harness cutting-edge technologies to make real improvements to homeland security. The resources that these changes would require to actualize might be better spent on programs that the OIG agrees have a proven track record of increasing security, such as compliance monitoring and training programs for administrators in government labs, universities, and industry. Administrative time devoted to making these changes would be better spent clarifying and enforcing existing regulations rather than creating new regulations with enormous bureaucratic and opportunity costs and no real benefits.

4) The recommendations reflect significant misunderstandings of editorial review.

The editorial review board process does not negate the fundamental nature of research. Many government laboratories use ERBs to ensure that all fundamental research leaving the lab for publication is free of any sensitive materials. If the ERB process is deemed to negate the fundamental research provisions, many agencies that voluntarily instituted ERBs or similar processes will eliminate them in order to retain the right to call their work fundamental research. This will serve only to increase the risk that sensitive information might be released in journals or conference proceedings with worldwide dissemination, making the United States less safe as a result.

In the case of other bodies that instituted ERBs as a result of legislative or executive directive, the requirement that ERBs review potential publications does not mean that the bulk of research conducted by these bodies is not fundamental. Rather, ERBs exist to ensure that what is published is not sensitive; ERBs are simply a safeguard and do not create the presumption of research being non-fundamental or secretive. Indeed, if ERBs only reviewed non-fundamental research, then they would act as a wall rather than a filter, because non-fundamental research is typically classified and banned from consideration for publication. The existence of an ERB, then, is a prima facie case for the research before it being fundamental; as a NIST representative argues, “If NIST did not intend to publish, we would not send [a] document for review.”⁸ Finally, it should be noted that since the establishment of NIST’s ERB, “not one publication has

⁸ Department of Commerce (2004), Appendix D, pg. 48.

been withheld because of concerns about releasing sensitive information.”⁹
Analysis by the OIG, then, perverts the purpose of ERBs.

Significantly, 15 CFR §734.8(b)(2) explicitly states that prepublication review in the university setting does not negate the status of reviewed research as fundamental in nature. If this logical protection exists in the university setting, by what rationale should it be denied government labs and industrial entities pursuing fundamental research?

5) This is a solution to a problem that may not exist.

The OIG’s report does not outline one instance in which the current rules have allowed even a minor breach of security or permitted any sensitive information to pass into the hands of an unfriendly state. Many of the concerns raised by the OIG’s report, such as the operation manual for a five-axis machine tool being left on a work table at NIST, are in fact straw men: similar instruction manuals can be purchased from German or Canadian sources or, more simply, can be found on the internet. Similarly, the process and code to assemble processors in parallel to exceed speeds of 190,000 MTOPS – one of the technologies subject to EAR – can be found on the internet or in the knowledge bases of computer engineering professors and professionals worldwide. We are unaware of any evidence that the current regulations create any serious threats to America’s ability to control the flow of sensitive information that would be remedied by the new provisions.

While CRA understands the need and supports efforts to ensure that sensitive technologies are not revealed to unfriendly states, the proposed rule changes do little to significantly improve American security, while creating significant new burdens on the bureaucracy and researchers. The best way to ensure America’s homeland security and future economic growth is to ensure that we remain a beacon for the best and the brightest from the world’s technical and scientific communities. The proposed rule changes will only serve to hinder this goal.

⁹ Ibid.