



## BARRIERS TO U.S. SCIENCE AND TECHNOLOGY LEADERSHIP

SPIE, the International Society for Optics and Photonics **supports:**

- An overhaul of U.S. export controls to ensure U.S. security in the future, protect the economic interests of U.S.-based industries and universities while recognizing U.S. security interests
- Implementation of the recommendations suggested in the *Beyond Fortress America Report* issued in 2009 by the National Research Council
- Legislation to award green cards to immigrants who receive a Ph.D. or master's degree in science, technology, engineering or math subjects from a U.S. university.

Congress and the Administration have begun discussing a major overhaul of the nation's export control laws.<sup>1</sup> SPIE agrees with many of the findings of experts who testified before the **House Science & Technology Committee** on February 25, 2009 about ongoing damage being done to the nation's economic well-being through unintended consequences of current export control regulations and policies. Overly restrictive regulation on the export of dual-use technologies, visa issues, and the inconsistent interpretation/enforcement of regulations have created business, educational, and research barriers that are limiting U.S. leadership in science and technology. SPIE agrees with the assessments of former U.S. National Security Advisor, Lt. General Brent Scowcroft, USAF (Ret.) who testified that:

- Export controls constrain both U.S. commercial and military capabilities from expanding into new fields and from applying new scientific developments
- The government's rules are accelerating the development of technologies in capable research centers outside the United States
- As foreign companies and governments fill competitive gaps, valuable technical developments occur outside the U.S. to which the U.S. military and intelligence agencies then have no access
- U.S. scientists are hobbled by rules that prevent them from working with world-class foreign scientists and laboratories — making it less likely that discoveries will occur in the U.S.
- The government's rules are driving many high-tech jobs abroad — these are knowledge-intensive jobs that are critical to the U.S. economy and its future growth.

SPIE believes that Congressional reform of export control policy should implement recommendations suggested in the *Beyond Fortress America Report* issued in 2009 by the National Research Council, an arm of the National Academy of Sciences. The Report, which concluded that national security controls are "broken" and that their misapplication "stifles American engagement in the global economy and science," calls for ending Cold War-era national security controls on U.S. exports of defense and civilian-military, dual-use technology and products.

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1. "Overhaul of Export Controls on Table," Washington Times, January 27, 2010.  
2. Illuminating a World of Opportunity, Canadian Photonics Consortium, January 2009 and Perspectives on the Optoelectronics industry: An OIDA Forum report", January 2008, OIDA.

**Key Findings and Recommendations from Beyond "Fortress America" National Security Controls on Science and Technology in a Globalized World** [http://books.nap.edu/catalog.php?record\\_id=12567](http://books.nap.edu/catalog.php?record_id=12567)

**Finding 1.** Designed for the Cold War when the U.S. had global dominance in most areas of science and technology, the current system of export controls now harms our national and homeland security, as well as our ability to compete economically.

- A. In almost all cases, the technology base that supports our national security also supports the high-technology sector of the civilian economy.
- B. Many controls imposed in the name of national and homeland security do not, in fact, improve national and homeland security.
- C. Many current controls (outside of narrow military niches) aimed at protecting national security, in fact weaken U.S. innovation and competitiveness in global markets, thereby reducing economic prosperity, which is an essential element of U.S. national security.

**Finding 2.** The system of export controls on the international flow of science, technology, and commerce is fundamentally broken and cannot be fixed by incremental changes below the presidential level.

- A. For most of the last twenty years, the executive and legislative branches of the federal government have failed to come to agreement — either internally or with each other — on dual-use export control policy. This failure has led to unnecessary vulnerabilities in our national security and in our economic competitiveness.
- B. The current list-based systems are unwieldy, slow, difficult to administer rationally, and are overly prescriptive given global developments in science and technology.
- C. The lack of multinational consensus among our allies about export controls further reduces the effectiveness of unilateral U.S. actions.

**Finding 3.** U.S. national security and economic prosperity depend on full global engagement in science, technology, and commerce.

- A. Highly capable centers of scientific research excellence and industrial innovation have been developed in many foreign countries over the past 20 years; the U.S. maintains scientific leadership in some areas, and it is hotly contested or has been lost in others. (Note - since more than 80% of optoelectronic production worldwide is outside the U.S., future national security capability may become dependent on foreign production.<sup>2</sup>)
- B. Global information exchange via the Internet, the increased speed of science and technology advancement, and the strategy of “run faster” are all incompatible with our existing systems of regulating the movement of people, ideas, components, and products.

**Recommendation 1.** The President should restructure the export control process within the federal government so that the balancing of interests can be achieved more efficiently and harm can be prevented to the nation’s security and technology base; in addition to promoting U.S. economic competitiveness.

**Recommendation 2.** The President should direct that executive authorities under the Arms Export Control Act and the Export Administration Act be administered to assure the scientific and technological competitiveness of the United States, which is a prerequisite for both national security and economic prosperity.

**Recommendation 3.** The President should maintain and enhance access to the reservoir of human talent from foreign sources to strengthen the U.S. science and technology base.