

Comments of the
Semiconductor Industry Association (SIA)
Request for Information Regarding Federal Technology Transfer Authorities and Processes

83 Fed. Reg. 19052 (May 1, 2018)

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The Semiconductor Industry Association (SIA) is pleased to submit these comments on the National Institute of Standards and Technology (NIST) Request for Information (RFI) Regarding Federal Technology Transfer Authorities and Processes.

SIA is the trade association representing leading U.S. companies engaged in the research, design, and manufacture of semiconductors. Semiconductors are the fundamental enabling technology of modern electronics that has transformed virtually all aspects of our economy, ranging from information technology, telecommunications, health care, transportation, energy, and national defense. The U.S. is the global leader in the semiconductor industry, and continued U.S. leadership in semiconductor technology is essential to America's continued global economic leadership. More information about SIA and the semiconductor industry is available at www.semiconductors.org.

RFI Question (1) - What are the core Federal technology transfer principles and practices that should be protected, and those which should be adapted or changed?

Federal investment in semiconductor research has played an important role in the advances that have driven the semiconductor industry over several decades. We appreciate NIST's request for information on issues related to technology transfer in order to improve this process and aid the semiconductor industry and other stakeholders in commercializing these innovations. In general, SIA strongly supports federal investment in semiconductor research and believes that core technology transfer principles and practices are sound.

There are a number of areas where federal policies and practices can be improved. As discussed in more detail below, improvements can be made with regard to (1) consistency in contracting practices, (2) intellectual property protection, and (3) compliance with export control regulations.

RFI Question (2) - What are the issues that pose systemic challenges to the effective transfer of technology, knowledge, and capabilities resulting from Federal R&D? Please consider those identified in the RFI as well as others that may have inhibited collaborations with Federal laboratories, access to other federally funded R&D, or commercialization of technologies resulting from Federal R&D.

SIA member companies engaged in research projects with federal agencies and national labs encounter a variety of problems associated with inconsistent practices and interpretations of requirements. The problematic practices include the following:

- Inconsistent instructions on the key points of contact on a research project
- Oral assurances that a company can ignore certain aspects of the contract

- Lack of standardization across labs and agencies, which can cause confusion among company technologists and in-house legal staff

Several SIA members participate in the DOD, DOE or NIST related manufacturing institutes. To improve the efficiency of the tech transfer and functional mechanisms of the institutes, the federal government should implement standard contracting processes and rules regarding in-kind support contributions. For example, each institute currently employs a slightly different process for reporting in-kind support. Ideally, all in-kind support to the institute would be submitted in a single report to the institute each month.

Significant variability exists across the current federal consortia in all aspects of business practices and operations. In addition to complicating memberships at multiple consortia, this variability also makes it difficult to assess the value proposition of membership. Establishing some amount of commonality in areas that include membership benefits, the membership agreement, IP rights, project calls, project management and oversight, and guidelines for acceptable in-kind contributions will provide much needed clarity to prospective federal consortia members. This help in establishing a consistent set of expectations for organizations when they engage with federal consortia.

Another systemic problem relates to intellectual property. IP is the lifeblood of the semiconductor industry. Semiconductor companies in the U.S. invest, on average, approximately 20 percent of revenue in research and development, among the highest of any industry sector. Much of the IP of value to the semiconductor industry is in the form of trade secrets – the technical know-how that is intended to be protected from disclosure to third parties. IP rights are one of the major obstacles to commercial companies engaging with the federal government in research.

SIA companies identified numerous problems associated with federal research and the protection of IP. For example, it is unclear when data may be subject to disclosure under a Freedom of Information Act request, particularly a request by a competitor. Companies also remain concerned about the prospect of government agencies exercising their “march-in” rights and grant licenses to, and perhaps at the request of, a competitor, even while acknowledging that this remains a remote prospect.

RFI Question (3) - What is the proposed solution for each issue that poses a systemic challenge to the effective transfer of technology, knowledge, and capabilities resulting from Federal R&D? Please consider the approaches identified in the RFI.

SIA offers the following suggested solutions to the problems identified above.

- Consistency in contracting practices – Agencies need to improve contracting practices, such as utilizing standard contract templates and terms that would enable companies to evaluate contract terms in advance. These standard templates should be harmonized across agencies to the extent possible and interpreted in a consistent manner.
- Disclosure of intellectual property – We suggest that the regulations be made clearer to specify that trade secrets and know-how are exempt from disclosure under FOIA. With regard to march-in rights, we recommend that research agencies provide greater clarity on the circumstances in which march-in rights may be exercised, and to impose limits on the exercise of those rights for the benefit of direct competitors absent *bona fide* concerns of public health and safety. While such rights may be rarely exercised and

only in extenuating circumstances, it remains a risk and a source of uncertainty.

- Formation of consistent IP terms – In establishing new government-university-industry collaborations, each new organization has the challenge of negotiating a membership agreement with prospective members. One of the most significant factors contributing to the delayed launch of collaborations relates to defining terms and conditions that are acceptable to all prospective members, with IP terms historically being the biggest area of contention. Prospective members from government, industry, and academia all typically have different priorities with respect to IP management, but still need to agree to a mutually acceptable set of terms and conditions. To speed up the membership process, collaborations could consider creating an IP Council comprised of industry representatives from various types of member organizations, and also including government and academia representatives to collaboratively develop a mutually acceptable IP management plan for the organization which prioritizes safeguarding manufacturers' rights to use the IP to commercialize products. The creation of a member-driven model IP agreement for use by new collaborations as a template would likely reduce the time required to finalize a collaboration's structure.

A well accepted consortium practice is that background, solely-developed IP (i.e., IP developed outside the consortium) is solely owned, and jointly-developed IP (i.e., IP developed within the consortium) is jointly owned. A non-exclusive royalty free (NERF) license is typically granted to use consortium developed IP both internally and externally, but typically no sublicense rights are granted. Given the variability that exists between federal collaborations, some variation in IP management plans between collaborations is reasonable. However, collaboration members expect access to collaboration-created IP to be commensurate with their respective level of investment and membership tier. A current consortium best practice is to grant a perpetual, worldwide, NERF license for all consortium-developed IP and project results to all top tier consortium members, with lower tier members being granted a similar license to institute-developed IP and project results for only those projects they directly support.

Retention of IP rights after the end of a collaboration - An essential element of the business case supporting collaboration membership relates to access to IP and project results. Some collaborations have explored implementing a clause in the membership agreement that immediately suspends access and rights to all institute project results and IP upon termination of institute membership. Although the motivation behind this clause may be to incentivize continued membership in the collaboration for existing members, prospective member organizations typically view this as a "deal breaker" since it reduces the long-term value proposition of membership. When a collaborative member contributes resources to a joint project, they typically have the very reasonable expectation that they will retain access to all project data and IP that they invested in, and to which they rightfully obtained access to, from the duration of their membership.

RFI Question (4) - What are other ways to significantly improve the transfer of technology, knowledge, and capabilities resulting from Federal R&D to benefit U.S. innovation and the economy? What changes would these proposed improvements require to Federal technology transfer practices, policies, regulations, and legislation?

In addition to the challenges identified above, SIA believes that there are other challenges to be considered.

- Sustainability of Consortia - An issue with significant impact and general applicability regards sustaining collaborative institutions once they are established. It is important that any federal funding provided is sufficient to accomplish meaningful results. Maturing new technologies and bringing them across the “valley of death” requires substantial resources, and a critical mass of funding over a period of time is necessary to be able to perform meaningful work. Initial consortium seed funding should be sufficiently substantial to attract the highest quality proposers and a sufficiently large membership base required for long-term collaboration sustainment and mission success.
- Additional Government Funding Opportunities – Federal agencies should consider funding projects through existing consortia. For example, the Air Force Research Lab (AFRL) has occasionally sponsored a “Directed Project Call” at one manufacturing institute, a process where competitive bidding on the project is open to institute members only. This is an outstanding benefit of institute membership, and additional funding opportunities like this can play a significant role in the long-term sustainment of the institute. By choosing projects through existing consortia, federal agencies can:
 - Leverage the project execution framework already in place at a consortium
 - Ensure the opportunity is communicated with the true thought leaders in the field
 - Encourage collaboration between large industry, small and medium size enterprises, and academia that otherwise might not occur
 - Increase the project scope that may be executed through 1:1 cost matching by consortium members

This approach benefits all parties (the federal agency, the consortia, and consortia member organizations), and can play a significant factor in the long-term sustainment of the consortium.

Finally, we recommend that NIST consider issues associated with compliance with export controls. Most government contracts and funding authorizations have export control provisions or are otherwise, as a matter of law, affected by the limitations in the export control rules on sharing various types of technology with foreign persons. The U.S. government’s primary export control regulations are the Export Administration Regulations (EAR) and the International Traffic in Arms Regulations (ITAR). By definition, these regulations exist to control the transfer of technology to destinations, end uses, and end users of concern for national security and foreign policy purposes; they do not exist to promote the transfer of technology. Nonetheless, they need to be regularly reviewed and updated to more effectively achieve their national security and foreign policy objectives **with the least possible regulatory burden** to further the federal government’s technology transfer goals.

SIA member companies take seriously their compliance obligations under the export control regulations. As commercial companies that seek to grow markets around the world, engagement in federal research can create complications with export control compliance. Technology evolves quickly. Some evolutions lead to widespread commercialization of once advanced technology meaning that strict controls are no longer effective or necessary. Other evolutions, particularly as a result of government funding, lead to the development of critical technology of national security concern that was not contemplated when the regulations were last updated. Either way, national security and economic security depend upon a nimble, experienced, and well-funded export control system to address such issues. If the lists of controlled technologies – primarily the U.S. Munitions List and the Commerce Control List – are not regularly reviewed and updated, both the national security and the economic security of the

United States are harmed. Thus, to limit unintended and collateral harms to technology promotion efforts, we recommend the following:

- The Administration should commit to publishing on a regular basis Notices of Inquiry asking for public comment on the categories of items controlled on the U.S. Munitions List (USML) and the Commerce Control List (CCL). To its credit, the Administration has done this for some USML categories, but we are recommending a broader commitment to the schedule generally and that it include the CCL, which includes controls on dual-use items. The Notices should seek input and information about whether controls are outdated, no longer relevant, and whether controlled technology is widely available outside of export regime-member countries. If the information provided is robust and reliable, then the government should amend the relevant control accordingly or propose changes to the relevant regime.
- The Administration should commit to ensuring that the export control agencies – primarily Commerce’s Bureau of Industry and Security, State’s Directorate of Defense Trade Controls and Bureau of International Security and Non-proliferation, and Defense’s Defense Technology Security Administration – are sufficiently funded and staffed. Without adequate and well-trained technology and regulatory staff, then it is not as easy to do the hard work necessary to review controlled technologies that no longer need to be and uncontrolled technologies that should be. With respect to the latter point, we support the requirements set out in the Foreign Investment Risk Review Modernization Act (FIRRMA)¹ to identify and control in a regular order process emerging technologies essential to national security.

We also suggest changes in government contracting practices related to export controls. As a matter of process, companies have indicated that provisions governing EAR compliance are often added toward the end of the contract process, which adds to the cost and complexity of finalizing a contract. SIA recommends that when it is appropriate to include contract clauses pertaining to EAR compliance, these provisions should be incorporated into the contract at the beginning of the process.

Separate from the foregoing recommendations, we ask that government contract clauses in, for example, technology development contracts be properly calibrated. Such clauses often contain “boilerplate” provisions that all technology produced pursuant to the contract is export controlled. Others per se prohibit the release of technology to all foreign persons. Although technology of concern should, of course, be controlled, it is not the case that all technology needs to be controlled equally all the time. A primary way of addressing such over-broad contractual controls is to ensure that they are tailored to current export control regulations. To the extent technology to be developed under a contract is not subject to general licensing requirements under the regulations, the contract or other funding authorization should not say so. We appreciate that this is not an easy recommendation to implement. Amending and tailoring standard contract forms is difficult. Government contracting officials are not always well versed in the export control system. Nonetheless, tailored and properly calibrated export control provisions are important to prevent both over-controls and under-controls.

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SIA appreciates the opportunity to provide these comments.

¹ Title XVII of the Conference Report to H.R. 5515, the National Defense Authorization Act of 2019.