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Improving the Department of Defense’s Small Business Innovation Research Program

Addendum

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Improving the Department of Defense’s Small Business Innovation Research Program  
Addendum

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The subsequent questions and answers found in this document were received from the Committee for additional information following the hearing on April 26, 2007 and were submitted for the record.

Question 1: In your testimony you comment about DoD’s solicitation schedule and recommend more frequent solicitations to provide flexibility to meet DoD technology needs in a timely manner. What do you estimate would be the additional administrative cost of this flexibility? Do you think there is an appropriate legislative solution for this?

Answer 1: Under current procedures, the additional administrative cost could be substantial, though additional study is merited to determine what that cost would be. Current procedures issue a service/agency-wide call for topics. Submitted topics then are modified and approved through various levels of command and management; ultimately the Office of the Director of Defense Research and Engineering provides the final approval. This centralized process is administratively burdensome, so most agencies and services limit their topic proposal and SBIR solicitation exercise to only one or two of the regularly scheduled DoD SBIR solicitations per year in order to improve process efficiency. Increasing solicitation frequency should, therefore, be linked to other SBIR program reforms intended to improve overall flexibility and utilization of research outcomes.

Potential legislative solutions could include providing for final topic approval at a level lower than the DoD level. This would allow the services/agencies to significantly stream-line the topic approval process. Additionally, legislation could mandate an “open” solicitation, at either the

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service/agency level or at the DoD level, to which SBIR topics could be added at any time. Given the current sophistication of available internet search and alert tools, an open SBIR solicitation would have the same effect as regularly scheduled solicitations in providing small businesses a simple means for learning about opportunities available in the program.

**Question 2:** What improvements would you recommend in the award application process which would lower application costs for small businesses and reduce the funding gap between Phase I and II awards?

**Answer 2:** It is not clear that the application process for Phase I awards could be improved significantly to lower application costs without detracting from competition or reducing the amount of information required to make informed award decisions and collect information necessary to manage and monitor the SBIR program. Phase II award costs could be reduced in some cases by making Phase II an option on the initial Phase I contract. (The term “option” as used here is different than the Phase I Option program that provides bridge funding when a Phase II award is anticipated.) This would also have the added benefit of reducing the funding gap between Phase I and Phase II. Rather than have the small businesses prepare a second proposal and enter into a second contract, a Phase II option would allow contracting officers to simply exercise the option upon successful completion of Phase I and a decision by the benefited command, program office, laboratory or research center to continue the work.

Since Phase I studies are usually feasibility studies, managing Phase II awards as options on the Phase I contract will require some additional work and innovation in drafting and negotiating the Phase I contract. For example, there would need to be provisions that allow for adjustments in the technical direction of the project and in the anticipated cost of Phase II. Nevertheless, the additional effort could be rewarded by much less effort in making Phase II awards and a much reduced funding gap between research phases.

**Question 3:** You make the case for flexible program administration, including award size. In addition to award size, what other specific areas of program administration would benefit from flexibility? Please describe how flexibility should be implemented? Is there a need for statutory change?

**Answer 3:** I mentioned above, in answer to question 1, that solicitations should be more frequent or there should be some provision for an “open” solicitation to make the initiation of SBIR research more responsive to the needs of the DoD’s technology customers. In addition, the actual schedule and pace of the research should be responsive to the requirements of the DoD
technology customer and to the progress of the research. For example, in some cases, Phase I might require very little time. By using a Phase II contract option, as I described in question 2, Phase II could be started very quickly. Depending on the research, such an approach would have the benefit of moving the technology through research and development much more quickly.

I believe the current SBIR law already allows enough flexibility with regard to project and solicitation schedule flexibility. At issue are established procedures for managing the SBIR program in DoD. These procedures evolved mainly in response to process efficiency requirements. Legislation that requires administrative funding for the SBIR program to be drawn from the SBIR set-aside could change the incentives that make process efficiency in the DoD SBIR program more important than research utilization.

Flexibility concerning the kinds of research and development appropriate to the SBIR program would also be very useful. The word “innovation” does not just mean cutting edge science and technology. In fact, and as currently recognized in the law, one common interpretation of innovation is the development of existing science and technology for new uses. Some examples of how to be more innovative about “innovation” are illustrative.

a. The SBIR program could be a particularly effective resource for conducting engineering improvement programs for already fielded items of equipment. Program offices managing fielded equipment, particularly when there is no product improvement program approved, usually have very few resources for improving the equipment they manage; for example, developing more robust components to replace ones that wear out quickly. The SBIR program can be this kind of resource, providing development funds that potentially improve equipment performance and save other resources.

b. The SBIR program could be engineered into a resource for the rapid development of technology urgently needed by deployed forces. Though there are other programs and processes to do this, realigning funding can be time consuming. The SBIR program could be an accessible source of innovation funding that doesn’t need reprogramming.

c. Provide SBIR awards to take a technology through several steps in development. For example, a Phase I and II award might be used to develop a brass-board prototype of a technology, a second Phase I and II might take the technology from brass-board to operational prototype and a third Phase I and II might provide for full up testing and product refinement. (There are some efforts along these lines now.)
A broad, legislative restatement of what is meant by innovation and how that applies to the SBIR program would help resolve debate about the appropriate use of SBIR resources.

**Question 4:** What specific percentage administrative cost recovery of the SBIR set-aside dollars do you recommend and what types of administrative costs would you include; what would you exclude.

**Answer 4:** There are a number of research management comparisons that can be used to develop an estimate for a specific percentage administrative cost recovery of the SBIR set-aside dollars. For example, the Navy’s SBIR program appears to be more successful in commercializing its research results. That program taxes its RDT&E accounts an additional 6.5% of the value of the SBIR set-aside to fund administrative and commercialization costs. Commercial venture capitalists draw an annual management fee that averages about 2.5% of funds under management, plus they earn a significant portion (~20%) of any return on investment that is earned. In the DoD, the account for RDT&E Management Support averaged nearly 8% between FY 2000 and FY 2008. Based on these benchmarks, I recommend that the percentage administrative cost recovery of the SBIR set-aside dollars be at least 6%, and perhaps even higher.

Administrative cost recovery funds should be allowed to address most administrative costs associated with managing the SBIR program, including contract management, topic and solicitation writing, proposal evaluation, technical support and oversight, and the programmatics associated with integrating SBIR research with other acquisition and R&D programs.

Whether administrative cost recovery funds should be allowed to fund business development activities for participating DoD SBIR companies is a matter that requires more research and explicit policy decisions concerning these kinds of activities. In fact, current law already allows some SBIR funds to be used for these purposes.

**Question 5:** In your written testimony, you say there are Department of Defense SBIR award winners in what you describe as “research houses” who provide research as a service but without the ultimate goal to develop a marketable product. Why don’t these firms focus on commercialization? How widespread is this practice? What can be done to focus on the commercialization goals of the SBIR program?

**Answer 5:** The business model of these firms is to provide a service, and that service is research. Firms that focus on research as service do so because selling research services can be
a successful business model. Research is also what motivates the people in these firms rather than the other tasks that go into commercialization, such as marketing, sales, product development and manufacture. Research services like this are also important to organizations that require the work but don’t have an in-house capability for it and, for any number of reasons, do not want to develop the capability.

In the SBIR program, research houses can be very valuable contributors provided that their work will ultimately result in a product, process or technology used by the DoD. A mechanism for enforcing this requirement is available in the Commercialization Achievement Index (CAI). Research houses that conduct numerous SBIR projects should be able to achieve reasonable CAIs through licensing fees, follow-on research contracts and other additional investment from companies interested in the technology. Those that do not achieve reasonable CAIs should not continue to receive SBIR awards.

Our research did not examine how widespread this business model is.

Getting more focus on the commercialization goals will require more “mainstreaming” of the DoD SBIR program into the acquisition activities of the DoD. So long as most of the DoD SBIR program is managed from the laboratories and R&D centers, technology transition and commercialization will remain difficult. Management of the program should be more aligned with sources of SBIR funds. Since the DoD’s acquisition programs provide most SBIR funds (6.4 and 6.5 dollars represent the largest categories of DoD RDT&E funding) this kind of alignment would give acquisition program managers greater control of SBIR funds and projects. In keeping with my theme above, if acquisition managers are given more control of SBIR projects, they should also be given the resources to adequately manage and integrate the research into their programs.

It should be recognized that in recent years there have been efforts to make the DoD’s acquisition community more involved in the SBIR program. With the possible exception of the Navy, these efforts remain inadequate, however, and more needs to be done.

**Question 6:** You recommend increasing the role of the Department of Defense’s (DoD) acquisition staff in managing SBIR projects, such as in award topic selection. What are the current best practices in DoD which support integration with DoD’s acquisition processes? Is a change in the statute needed?
**Answer 6:** The Navy currently provides examples of best practices. It does a number of things differently and these appear to have had an impact on commercialization success.

First, the Navy directly funds SBIR technology transition management. It collects an additional .1625% on top of the 2.5% of extramural R&D to provide funding for technology transition assistance and management.

Second, the Navy participates in all four DoD SBIR solicitations.

Third, the Navy’s philosophy concerning use of SBIR resources seems to be that organizations should benefit from the program more in relation to the contribution they make toward the program.

Fourth, the Navy has personnel at each SYSCOM/PEO funded by and dedicated to managing the SBIR program.

Fifth, the Navy’s leadership appears to be pushing management of SBIR projects down through the PEO structure to individual program management offices (PMO). This is currently most evident in NAVSEA and NAVAIR, where topic selection, proposal review, and project oversight are managed by personnel in the PMOs and PEOs, rather than the laboratories and R&D centers. This greatly increases the chances that a particular project will be responsive to the needs of an acquisition activity.

Legislation that could support these kinds of best practices include:

a. Allowing funding of SBIR administration costs from the SBIR “tax” on extra mural R&D.

b. Requiring some percentage of SBIR projects be managed by the acquisition community. The actual percentage should probably be made a function of the SBIR tax the programs in each PEO pay into the SBIR program.

c. Legislatively defining “innovation” and “commercialization” such that pursuit of the SBIR program’s innovation and commercialization goals will necessarily require more participation by the acquisition community.

d. Requiring greater application of commercialization achievements as a proposal evaluation criterion.
**Question 7:** You describe the DoD SBIR leadership focus is on statutory compliance rather than research outcome and utilization? Given this assessment, what is your view on doubling the size of the SBIR program? You also suggest the question around increasing small business participation should be on increasing the quality of the participation not the overall number of companies participating. Is this a current problem?

**Answer 7:** The DoD SBIR program should not be doubled in size until and unless it is demonstrated that the results of the research are being incorporated into DoD equipment, processes, or other DoD R&D activities. This demonstration requires that appropriate and measurable metrics be defined and goals established that benchmark acceptable SBIR research utilization success.

The most consistent complaint we heard from the small business SBIR program participants was that there was no path to take their research forward after the end of each project. Therefore, by “quality of participation”, I mean that SBIR research projects should be selected and managed so that they directly support and are integratable into DoD acquisition programs and research initiatives. This kind of participation is much more likely to result in the results of the research being incorporated into DoD equipment or contributing to important research efforts. Too often, SBIR projects today are managed as something outside mainstream efforts and result only in reports that are rarely read after the conclusion of the project. Simply increasing the number of small business participants will not relieve this issue. On the other hand, if SBIR projects are perceived as valuable contributors to acquisition program success or to research that leads to future acquisitions, then demand for SBIR resources will increase and more small businesses will seek participation in the program.

**Question 8:** What do you see are the most significant data gaps with respect to program evaluation and the most effective ways to address these gaps in the future? Who needs to gather this information and what are the impediments to compiling this information today?

**Answer 8:** The DoD SBIR program currently collects sales and additional investment data from companies that previously participated in the federal SBIR program and are making a new SBIR proposal. This data can provide insights into whether SBIR research is being used in the development of military equipment. Additional data that is more specific on actual use could provide greater insight. Such data might include the specific examples of use, time to use and TRL levels. Actual metrics, however, will require additional development to determine what information can be feasibly collected. Whatever metrics are ultimately required, they needs to be
collected on an on-going basis and would best be collected by SBIR managers assigned to specific PM/PEO offices, laboratories and R&D centers.

The ability to collect adequate data for assessing the DoD SBIR program is currently impeded by two things. First, metrics for assessing SBIR program success are ill-defined and actual reporting requirements are focused on program execution. Second, the resources dedicated to managing the SBIR program are too few to adequately evaluate and oversee the program much beyond the execution metrics that are reported up through the DoD, to the SBA and ultimately to Congress.

**Question 9: Please recommend how you would structure on-going administrative oversight and evaluation of the DoD SBIR program? Are these recommendations appropriate to other SBIR agencies?**

**Answer 9:** Oversight of the SBIR program needs to be more closely tied to the program’s legislative purpose. In order to make this possible, specific criteria and benchmarks that are directly related to the program’s legislative purpose must be established, and metrics that can be used to assess how well the SBIR program is addressing the criteria and meeting the benchmarks must be developed and the data collected. Reporting requirements for the SBIR program also need to be more closely tied to the legislative priorities for the program.

In addition, the structure of SBIR oversight and evaluation responsibilities should more closely align to the legislative priorities. For two of the services and to some extent at the DoD level, much of the oversight and evaluation responsibility is established in Science and Technology organizations, such as the Office of the Director of Defense Research and Engineering (DDRE) and the Director for Research and Laboratory Management in the Army. These organizations certainly have a stake in the SBIR program and should retain organizational responsibility for oversight and evaluation of SBIR projects that are comparable to research conducted under the DoD’s RDT&E research categories 6.1 through 6.3. However, acquisition organizations should have organizational responsibility for oversight and evaluation of SBIR projects that are comparable to research conducted under the DoD’s RDT&E 6.4, 6.5 and 6.7 research categories.

The DoD’s current SBIR management structure is too lean to provide more than program execution oversight and some level of policy guidance. Adequate oversight of SBIR program utilization is not practicable without sufficient information to inform evaluation and people to actually conduct evaluations. Since the DoD SBIR program consists of two to four thousand on-going projects and many thousands of completed projects, and because these are research projects whose transition into fielded products is a very complex process, evaluating success is
necessarily a labor intensive endeavor. That is one reason why I recommend at least 6% of the program funds be set-aside for administrative costs. More personnel are needed at the DoD level, the service/agency level and the major command/PEO level to collect, analyze and report progress in the DoD SBIR program.

Administrative oversight and evaluation of the SBIR program should be structured to the purpose of the parent organization. Since these purposes vary and our research did not examine other SBIR organizations in detail, I cannot comment on how they should structure their SBIR program oversight and evaluation.

**Question 10:** Looking at Small Business Administration (SBA), how well has SBA done to date in providing management and oversight of the SBIR program? What do you recommend to improve management and oversight?

**Answer 10:** Our research did not examine SBA practices with regard to the SBIR program, so I cannot comment on question 10.