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**Implementation of the Department of Defense Small Business
Innovation Research Commercialization Pilot Program: Be All You
Can Be?**

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Preface & Acknowledgements

During his internship with the Graduate School of Business & Public Policy in June 2010, U.S. Air Force Academy Cadet Chase Lane surveyed the activities of the Naval Postgraduate School's Acquisition Research Program in its first seven years. The sheer volume of research products—almost 600 published papers (e.g., technical reports, journal articles, theses)—indicates the extent to which the depth and breadth of acquisition research has increased during these years. Over 300 authors contributed to these works, which means that the pool of those who have had significant intellectual engagement with acquisition issues has increased substantially. The broad range of research topics includes acquisition reform, defense industry, fielding, contracting, interoperability, organizational behavior, risk management, cost estimating, and many others. Approaches range from conceptual and exploratory studies to develop propositions about various aspects of acquisition, to applied and statistical analyses to test specific hypotheses. Methodologies include case studies, modeling, surveys, and experiments. On the whole, such findings make us both grateful for the ARP's progress to date, and hopeful that this progress in research will lead to substantive improvements in the DoD's acquisition outcomes.

As pragmatists, we of course recognize that such change can only occur to the extent that the potential knowledge wrapped up in these products is put to use and tested to determine its value. We take seriously the pernicious effects of the so-called “theory–practice” gap, which would separate the acquisition scholar from the acquisition practitioner, and relegate the scholar's work to mere academic “shelfware.” Some design features of our program that we believe help avoid these effects include the following: connecting researchers with practitioners on specific projects; requiring researchers to brief sponsors on project findings as a condition of funding award; “pushing” potentially high-impact research reports (e.g., via overnight shipping) to selected practitioners and policy-makers; and most notably, sponsoring this symposium, which we craft intentionally as an opportunity for fruitful, lasting connections between scholars and practitioners.

A former Defense Acquisition Executive, responding to a comment that academic research was not generally useful in acquisition practice, opined, “That's not their [the academics'] problem—it's ours [the practitioners']. They can only perform research; it's up to us to use it.” While we certainly agree with this sentiment, we also recognize that any research, however theoretical, must point to some termination in action; academics have a responsibility to make their work intelligible to practitioners. Thus we continue to seek projects that both comport with solid standards of scholarship, and address relevant acquisition issues. These years of experience have shown us the difficulty in attempting to balance these two objectives, but we are convinced that the attempt is absolutely essential if any real improvement is to be realized.

We gratefully acknowledge the ongoing support and leadership of our sponsors, whose foresight and vision have assured the continuing success of the Acquisition Research Program:

- Office of the Under Secretary of Defense (Acquisition, Technology & Logistics)
- Program Executive Officer SHIPS
- Commander, Naval Sea Systems Command
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- Program Manager, Airborne, Maritime and Fixed Station Joint Tactical Radio System



- Program Executive Officer Integrated Warfare Systems
- Office of the Assistant Secretary of the Air Force (Acquisition)
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- Deputy Director, Acquisition Career Management, US Army
- Defense Business Systems Acquisition Executive, Business Transformation Agency
- Office of Procurement and Assistance Management Headquarters, Department of Energy

We also thank the Naval Postgraduate School Foundation and acknowledge its generous contributions in support of this Symposium.

James B. Greene, Jr.
Rear Admiral, U.S. Navy (Ret.)

Keith F. Snider, PhD
Associate Professor



Panel 23 – Engaging Small Business in Defense Acquisition

Thursday, May 12, 2011	
3:30 p.m. – 5:00 p.m.	<p>Chair: Rear Admiral Seán F. Crean, USN, Director, Office of Small Business Programs, Department of the Navy</p> <p>Discussant: David Lamm, Professor Emeritus, Graduate School of Business and Public Policy (GSBPP), NPS</p> <p><i>Strategic Sourcing with Small Business in Mind</i> Lora Gross, Department of Veterans Affairs, Acquisition</p> <p><i>Implementation of the Department of Defense Small Business Innovation Research Commercialization Pilot Program: Be All You Can Be?</i> Max Kidalov, Kevin Hettinger, and Mario Gonzalez, NPS</p>

Rear Admiral Seán F. Crean—Director, Office of Small Business Programs, Department of the Navy. Mr. Crean serves as Chief Advisor to the Secretary on all small business matters. He is responsible for small business acquisition policy and strategic initiatives.

Mr. Crean joined the Secretary of the Navy Staff as a member of the Senior Executive Service in January 2010 and has over 30 years of federal service. Prior to receiving this appointment, he served as Deputy Assistant Secretary of the Navy for Acquisition and Logistics Management during a two-year military recall to active duty as a Rear Admiral in support of Operation Iraqi Freedom.

Mr. Crean's previous experience includes serving as the senior procurement analyst for the U.S. Small Business Administration's Office of Government Contracting Area I (New England) for 19 years. In this role he was the principal advisor to the SBA's six regional district offices and congressional delegations on procurement issues. He provided acquisition strategy analysis for over 20 buying activities throughout the region, supporting both DoD and Civilian federal agencies. He first entered federal civilian service as the Deputy Supply Officer for Naval Air Station Brunswick, ME, where he was also appointed the activity small business specialist.

Mr. Crean's combined military and civil service careers have provided complimentary and extensive leadership responsibilities in service to the country. As a member of the reserve component, he has attained the grade of Rear Admiral (two-star) and is currently assigned as Deputy Commander, Naval Supply Systems Command. He holds a Bachelor of Science degree in business management and marine transportation from State University of New York Maritime College and a Master of Business Administration degree from New Hampshire College's graduate school of business.

He has a number of personal and command decorations, including two Legion of Merit awards. He is a member of the Defense Acquisition Corps and is DAWIA Level III Contracting certified.

David Lamm—Professor Emeritus, Graduate School of Business and Public Policy (GSBPP), NPS. Dr. Lamm served at NPS as both a military and civilian professor from 1978 through his retirement in January 2004, teaching a number of acquisition and contracting courses, as well as advising thesis and MBA project students. During his tenure, he served as the Academic Associate for the Acquisition & Contracting Management (815) MBA Curriculum, the Systems Acquisition Management (816) MBA Curriculum, the Master of Science in Contract Management (835) distance learning degree, and the Master of Science in Program Management (836) distance-learning degree. He created the latter three programs. He also created the International Defense Acquisition Resources Management (IDARM) program for the civilian acquisition workforce throughout the country. Finally,



in collaboration with the GSBPP Acquisition Chair, he established and served as PI for the Acquisition Research Program, including inauguration of an annual Acquisition Research Symposium. He also developed the Master of Science in Procurement & Contracting degree program at St. Mary's College in Moraga, CA, and served as a Professor in both the St. Mary's and The George Washington University's graduate programs.

He has researched and published numerous articles as well as written an acquisition text entitled *Contract Negotiation Cases: Government and Industry* (1993). He served on the editorial board for the *National Contract Management Journal* and was a founding member of the editorial board for the *Acquisition Review Quarterly*, now known as the *Defense Acquisition Review Journal*. He served as the NPS member of the Defense Acquisition Research Element (DARE) from 1983–1990.

Prior to NPS, he served as the Supply Officer aboard the USS *Virgo* (AE-30) and the USS *Hector* (AR-7). He also had acquisition tours of duty at the Defense Logistics Agency in Contract Administration and the Naval Air Systems Command, where he was the Deputy Director of the Missile Procurement Division.

He holds a BA from the University of Minnesota and an MBA and DBA both from The George Washington University. He is Fellow of the National Contract Management Association and received that association's Charles A. Dana Distinguished Service Award and the Blanche Witte Award for Contracting Excellence. He created the NCMA's Certified Professional Contracts Manager (CPCM) Examination Board and served as its Director from 1975–1990. He is the 1988 NPS winner of the RADM John J. Schieffelin Award for Teaching Excellence.



Implementation of the Department of Defense Small Business Innovation Research Commercialization Pilot Program: Be All You Can Be?

Max Kidalov—Assistant Professor, Procurement Law & Policy, NPS, and Member, Small Business Advisory Council, U.S. Department of Energy. Mr. Kidalov graduated with a BS (cum laude) and JD from the University of South Carolina. For over three years during his prior service as Counsel for Procurement, Innovation, and Oversight Matters at the U.S. Senate Committee on Small Business & Entrepreneurship, then chaired by Senator Olympia J. Snowe (R-ME), Mr. Kidalov's responsibilities included oversight of federal small business contracting and subcontracting programs, as well as oversight of U.S. international trade agreements related to government procurement that affected small businesses. He also was a law clerk to the Honorable Loren A. Smith, formerly chief judge of the U.S. Court of Federal Claims.

Kevin Hettinger

Mario Gonzalez

Abstract

In Section 252 of the National Defense Authorization Act for Fiscal 2006, Congress adopted four wide-ranging reforms to the Department of Defense Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs in order to increase the effectiveness of SBIR and STTR for both the DoD and the defense industry. First, Section 252 directed closer alignment between R&D and acquisition goals of SBIR and STTR. Second, Section 252 authorized and funded creation by the Department of Defense (DoD) and the military Services of the Commercialization Pilot Program (CPP) to facilitate transition of SBIR technologies into the acquisition process. Congress conditioned the use of CPP funds on detailed evaluative reporting to Congress. Third, Congress codified into statutory law President George W. Bush's Executive Order No. 13329, which incentivized manufacturing technologies through the SBIR and STTR programs. Fourth, Congress clarified the authority to conduct testing and evaluation of SBIR and STTR technologies in SBIR and STTR Phases II and III. The implementation requirements were specified in the text of Section 252 and the Congressional Guidance Letter issued by the House and the Senate Small Business Committees.

This study analyzes the implementation of Section 252 by the Secretaries of Defense, the Army, the Navy, and the Air Force. It reflects the results of literature review and a survey of SBIR and STTR program executives. The study questions are based on Section 252 text and the Congressional Guidance Letter, as well as on best practices identified in relevant academic and professional literature. The study finds that although the DoD and the military departments have begun implementation of the DoD SBIR CPP program and other Section 252 reforms, progress is uneven. Specifically, agencies are not implementing Section 252 CPP incentives and R&D alignment requirements to the fullest extent possible. The study recommends clarifications of legislative requirements and additional review of Section 252 implementation.



Introduction

The U.S. Department of Defense spends close to \$1.5 billion a year on competitive R&D set-asides under the Small Business Innovation Research (SBIR) and the Small Business Technology Transfer (STTR) programs, established under 15 U.S.C. § 638. These competitive set-asides are designed to help small firms investigate ideas for new technologies (Phase I) and develop prototypes (Phase II). Congress intended that new technologies will be commercialized either through the federal procurement process or in private markets. To encourage return on SBIR and STTR investment, Congress directed federal agencies to purchase products and services developed through SBIR and STTR to the maximum extent practicable, and authorized government agencies to buy SBIR and STTR technologies from SBIR and STTR awardees (or their successor firms) on a sole-source basis. In recent years, however, both Congress and industry have grown increasingly frustrated with the low utilization of SBIR and STTR-developed technologies in DoD acquisition, especially in major defense acquisition programs.

In Section 252 of the National Defense Authorization Act for Fiscal 2006, “Research and Developments Efforts for Purposes of Small Business Research,” Congress adopted four wide-ranging reforms to the DoD SBIR and STTR programs in order to increase the effectiveness of SBIR and STTR for both the DoD and the defense industry. First, Section 252 directed closer alignment between R&D and acquisition goals of SBIR and STTR. Second, Section 252 authorized and funded creation by the DoD and the military Services of the Commercialization Pilot Program (CPP) to facilitate transition of SBIR technologies into the acquisition process. Congress conditioned the use of CPP funds on detailed evaluative reporting to Congress. Third, Congress codified into statutory law President George W. Bush’s Executive Order No. 13329, Encouraging Innovation in Manufacturing, which incentivized manufacturing technologies through the SBIR and STTR programs. Fourth, Congress clarified the authority to conduct testing and evaluation of SBIR and STTR technologies in SBIR and STTR Phases II and III. The implementation requirements were specified in the text of Section 252 and the Congressional Guidance Letter, issued by the House and the Senate Small Business Committees.

This paper analyzes the implementation of Section 252 by the Secretaries of Defense, the Army, the Navy, and the Air Force. It reflects the results of literature review and a survey of SBIR and STTR program executives. The study questions are based on Section 252 text and the Congressional Guidance Letter. Study questions also rely on best practices identified in relevant academic and professional literature, in innovation programs of other federal agencies such as NASA, and in practices of our NATO partners such as the United Kingdom and France. The study finds that while the DoD and the military departments have begun implementation of the DoD SBIR CPP program and other Section 252 reforms, progress is uneven. Specifically, agencies are not implementing section 252 CPP incentives and R&D alignment requirements to the fullest extent possible. The study recommends clarifications of legislative requirements and additional review of Section 252 implementation.

The following section, Background of the SBIR and STTR Programs, gives general background information about SBIR and STTR. The section describes the programs objectives. It also describes firms’ eligibility requirements to participate in the each program. A list of participating government agencies is also in this section. A description of each of the three phases for the programs is given at the end of this section.



Next, the section titled Background of FY06 NDAA Section 252 delves into specific background of Section 252, including details from National Academies Symposium, *SBIR and the Phase III Challenge of Commercialization*. Following that symposium, “the Senate Committee on Small Business & Entrepreneurship proposed legislation that called for a commercialization pilot program” (NAS, 2005, p. 29, footnote 23). The purpose of this section is to give the reader an idea of the SBIR and STTR program conditions prior to Section 252 by putting it in context. After reading this section, the reader should understand the reasons why Congress adopted Section 252.

A survey was conducted, directed primarily at SBIR and STTR program managers and administrators within DoD agencies and military Services, that attempted to ascertain how Section 252 has been carried out within these specific agencies. The Survey Methodology section describes in detail the methods we used. This section clearly states the survey questions that were given to participants. This section also describes limitations identified by the survey administrators.

The analysis section the paper describes results from this survey. All of the respondents’ answers for each question are analyzed and compared with the Section 252 legislation, the Congressional Guidance Letter, as well as with additional sources. The survey answers, in many cases, showed inconsistencies with the intent of the legislation as well as with announced practices.

Finally, the paper concludes with answers to the research questions and the authors’ recommendations.

Background of the SBIR and STTR Programs

The DoD SBIR program awards contracts to qualifying small businesses that display the promise of producing cutting-edge technology for military or dual-use applications. The technology may show promise, but that technology may still be too risky for private investment due to various reasons such as a relatively low technological readiness level and no past performance history for the company (Wessner, 2007). Therefore, an SBIR contract can act as initial funding to get what amounts to an idea developed into a product or service. The SBIR program began pursuant to the Small Business Innovation Act of 1982. The STTR program began pursuant to the Small Business Technology Transfer Act of 1992. SBIR and STTR have no permanent reauthorization, but have been periodically reauthorized since then. The main difference between SBIR and STTR is that SBIR contracts are open solely to small businesses, defined as businesses with less than 500 employees, and STTR contracts are open to small businesses that collaborate with not-for-profit research organizations such as universities and federally funded research and development centers (“SBIR and STTR Policy Directives,” 2002a, 2002b).

As stated in the Small Business Innovation Act (1982), the SBIR and STTR programs have four goals:

1. to stimulate technological innovation;
2. to use small business to meet federal and development needs;
3. foster and encourage participation by minority and disadvantaged persons in technological innovation; and
4. to increase private sector commercialization derived from federal research and development. (p. 1)



The fourth objective, commercialization, is defined by the U.S. Small Business Administration as “the process of developing marketable products or services and producing and delivering products or services for sale (whether by the originating party or by others) to Government or commercial markets” (“SBIR and STTR Policy Directives,” 2002a).

Federal agencies with extramural R&D budgets of at least \$100 million are required to participate in SBIR. Federal agencies with extramural R&D budgets of at \$1 billion are required to participate in STTR. Participating agencies are required to set aside 2.5% and 0.3% of their R&D budgets for SBIR and STTR programs, respectively.¹ Within the DoD, each military department as well as the Defense Advance Research Projects Agency (DARPA) and the Missile Defense Agency (MDA) administer their own SBIR/STTR programs. Seven agencies under the Office of the Secretary of Defense (OSD) administer the SBIR programs, but not STTR, including the Defense Logistics Agency (DLA), the Defense Microelectronics Activity (DMEA), the Defense Technical Information Center (DTIC), the Defense Threat Reduction Agency (DTRA), the Chemical and Biological Defense Program (CBDP), the Special Operations Acquisitions and Logistics Center (SOALC), and the National Geospatial-Intelligence Agency (NGA).

The DoD SBIR/STTR awards processes are divided into three phases. In Phase I, small businesses compete on SBIR/STTR topics that are published by the DoD. The DoD announces SBIR topics three times a year and STTR topics twice a year. Small businesses that earn Phase I contracts can generally be awarded up to \$150,000² while participating in SBIR and up to \$100,000 while participating in STTR (“SBIR and STTR Policy Directives,” 2002b). The purpose of Phase I is “for determining, insofar as possible, the scientific and technical merit and feasibility of ideas that appear to have commercial potential, as described in subparagraph (B), submitted pursuant to SBIR program solicitations.”³ Phase I awardees can be awarded up to \$1 million for SBIR and \$750,000 for STTR in a Phase II contract. The purpose of Phase II is “to further develop proposed ideas to meet particular program needs, in which awards shall be made based on the scientific, technical, and commercial merit and feasibility of the idea, as evidenced by the first phase and by other relevant information.”⁴

Phase III is considered the commercialization phase. This is the step in which only non-SBIR/STTR funds, typically from private-sector investment or defense acquisition funds can be used to develop an actual product or service. In some cases, enough work can be completed in Phase I or II to satisfy a program office.

Phase III refers to work that derives from, extends, or logically concludes effort(s) performed under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. Phase III work is typically oriented towards commercialization of SBIR research or technology” . . . but may also include continuation of R&D. “Phase III work may be for products, production, services, R/ R&D, or any combination thereof.” “For Phase III, Congress intends that agencies or their Government-owned, contractor-operated facilities, Federally-funded research and development centers, or Government prime contractors that

¹ The Statute is 15 U.S.C. 638.

² *Federal Register*, Volume 75, page 15,756.

³ U.S.C., Title 15, 638.

⁴ U.S.C., Title 15, 638.



pursue R/R&D or production developed under the SBIR Program, give preference, including sole source awards, to the awardee that developed the technology. In fact, the Act requires reporting to SBA of all instances in which an agency pursues research, development, or production of a technology developed by an SBIR awardee, with a concern other than the one that developed the SBIR technology.” “This notification must include, at a minimum: (a) The reasons why the follow-on funding agreement with the SBIR awardee is not practicable; (b) the identity of the entity with which the agency intends to make an award to perform research, development, or production; and (c) a description of the type of funding award under which the research, development, or production will be obtained.” SBA may appeal that decision. Other cases, SBIR/STTR projects cannot cross the funding “valley of death” between Phase II and commercialization. (NAS, 2005, pp. 5–6)

Background of FY06 NDAA Section 252

The purpose of Section 252 of the National Defense Authorization Act for 2006 was to reform SBIR and STTR. Section 252 mostly addresses issues within the SBIR program, but does refer to STTR. The reason why the Congressional and Senate Small Business Committees are concerned with the state of SBIR and STTR is they believe that leveraging the innovation of small businesses is vital for the U.S.’s national security. They also view Phase I and Phase II contract awards as investments of taxpayer dollars. Attempting to reform SBIR and STTR Section 252 added the following subsections to Section 9 of the Small Business Act: (x) Research and Development Focus; (y) Commercialization Pilot Program, language concerning Implementation of Executive Order No. 13329; and subsection (e)(9) language supporting testing and evaluation of SBIR and STTR technologies. Each of these subsections is meant to address challenges that have been identified within the SBIR and STTR communities by the National Academies Symposium on SBIR commercialization and other inputs from government and industry. These challenges include SBIR and STTR topic alignment, expediting the commercialization of SBIR and STTR projects and assurance that Executive Order No. 13329 is being implemented.

Reform 1: SBIR Topics Generation

Subsection (x) Research and Development Focus mandates that the Secretary of Defense (SECDEF) will engage in a Quadrennial SBIR/STTR Review in order to revise and update the criteria and procedures utilized to identify research and development efforts that are suitable for SBIR and STTR programs at least once every four years. According to the Congressional Guidance Letter, subsection (x) “addresses the need for a strategic, DoD-wide review of the SBIR and STTR program (conducted not less than quadrennially) based on the latest research, science, and technology plans of the DoD,” and based on the Joint Warfighting Science and Technology Plan, the Defense Technology Area Plan, and the Basic Research Plan. Each of these plans has a specific emphasis: joint warfighter operations, DoD-wide acquisition program priorities, and strategically disruptive/revolutionary technologies. Together, these plans were to focus research and development efforts within the DoD SBIR and STTR to specific areas previously identified of strategic importance to warfighting efforts. At the same time, subsection (x) also mandates that program managers and program executive officers be included during topic generation. If an SBIR/STTR project is not aligned with an acquisition program to fill in technological



gaps, then it is unlikely to attract those kinds of funds. Therefore, early involvement from program offices is essential.

Reform 2: Commercialization Pilot Program

Next, subsection (y) authorizes the Secretary of Defense and each military department secretary to create a Commercialization Pilot Program (CPP). The CPP's stated intent is to "accelerate the transition of SBIR technologies into Phase III including acquisition process." If a department decides to create a CPP, then the department must adhere to all the requirements within subsection (y). These requirements include that the SECDEF and the secretary of each military department must identify SBIR projects that show potential for rapid transition into Phase III and certify in writing that the identified projects will meet high priorities within that military Service. Each military department is authorized to use up to 1% of available SBIR funds to administer the CPP, but cannot be used to award Phase III contracts. Subsection (y) also mandates that the SECDEF must provide an evaluative report to the Committee on Armed Services and the Committee on Small Business and Entrepreneurship of the Senate and the Committee on Armed Services and the Committee on Small Business of the House of Representatives. This report must contain an accounting of funds, description of incentives and activities performed under the CPP, and results achieved under the CPP.

The origin of the CPP came from the 2005 National Academies SBIR Transition Symposium. This symposium was a gathering of leadership from government agencies, large defense contractors (prime contractors), and small businesses. During the symposium, representatives from each discussed challenges of commercialization from their own point of view. Policy reform recommendations at the symposium generally fell within two categories: (1) "possible changes in agency program management, including better use of incentives for managers, roadmaps, and greater matchmaking, and (2) ways in which small businesses and the prime contractors could better align their work to improve Phase III outcomes" (NAS, 2005, p. 23).

While focusing on the "incentives for better management" the intent was to incentivize program managers and program executive officers to introduce new technologies that can result not only in substantial time, cost, or performance benefits, but also can present some risk of disruption to program costs and schedules if the technologies failed. Leading government officials, industry executive, and policy experts proposed various incentives for better SBIR program management. For example, incentives were proposed in the following areas:

- **Alignment.** Entering the SBIR company into a program with which the program executive officer was already engaged is one way to better focus SBIR projects on outcomes that directly support agency programs (and program officer) objectives. As noted by some speakers, this could allow SBIR projects to connect with Phase III activities already under way.
- **Reliability.** This involves identifying technologies that have been operationally tested and need little if any modification. This suggestion by a participant reflected widely held views that program executive officer involvement was critical in bringing SBIR technologies to the necessary readiness level.
- **Capacity.** As Dr. Michael McGrath, Deputy Assistant Secretary of the Navy for Research, Development, Testing, and Evaluation, noted, SBIR firms need to take steps to convince program executive officers not only that the SBIR



technology works, but also that the small business will be able to produce it to scale and on time.

- **Budget Integration.** Some participants noted that program executive officers needed to see that the SBIR set-aside will be used to further their own missions. This calls for building SBIR research into the work and budget of program offices. By contrast, the Air Force's program offices submit a budget based on independent cost estimates. SBIR awards are then taken as a 2.5% tax out of that budget.
- **Training.** Major Stephen noted that training program executive officers to help them understand how SBIR can be leveraged to realize their mission goals is necessary. However, Mr. Carroll of Innovative Defense Strategies noted that SBIR training had been part of the general program executive officer training curriculum for one year, but had since been deleted.
- **Partnering.** As described by Carl Ray, the SBIR program at NASA is forming partnerships with mission directorates aimed at enhancing "spinin" — the take-up of SBIR technologies by NASA programs.
- **Emphasizing Opportunity.** Dr. McGrath noted that the Navy's SBIR management attempts to provide a consistent message to program executive officers and program managers—that "SBIR provides money and opportunity to fill R&D gaps in the program. Apply that money and innovation to your most urgent needs." (NAS, 2005, pp. 23–24)

With respect to the roadmaps, "some participants emphasized the need to coordinate small business activities with prime contractor project roadmaps." This is due to the complexities involved in integrating subsystems that are SBIR candidates into large weapon systems that prime contractors act as lead integrators.

Lockheed's Mr. Ramirez noted that "to make successful transitions to Phase III, SBIR technologies must be integrated into an overall roadmap." Lockheed Martin uses a variety of roadmaps to that end, including both technical capability roadmaps and corporate technology roadmaps. The Raytheon representative added that roadmaps are important because it is necessary to coordinate the technology transition process across the customer, the supply chain, and small businesses. Coordination should include advanced technology demonstrations, which could be used to integrate multiple technologies into a complex system. (NAS, 2005, pp. 24–25)

Ultimately, all symposium participants agreed that the transition to commercialization needed to be reformed. SBIR technologies need buy-in from program managers and prime contractors, and the attitude of SBIR being a "tax" on acquisition and R&D programs funding needed to change. Statements at the NAS Symposium provided examples of incentive strategies needed to effect such a change. Mr. Robert McNamara of the Navy, Program Executive Officer for PEO Submarines, described himself as an advocate of small business and said that the centerpiece of his advocacy was the SBIR program. In his Requests for Proposals (RFPs), he incentivizes primes to subcontract certain percentages of the work to small business.

For example, he contracted with General Dynamics on the Virginia-Class Program, demonstrating that small businesses are a high priority, and offered a million-dollar "bounty" per hull as an additional incentive fee for contractors who met small business subcontracting goals. The Navy owes it to the large prime contractors, he said, to provide real incentives for a policy considered truly important (NAS, 2005, p. 142).



Col. Stephen, U.S. Air Force, suggested that in order to gain buy-in, the program should be sure to focus not only on research but also on the results that program managers need—outputs that directly support agency objectives. Dr. Parmentola agreed, saying that program managers want technologies that have been operationally tested and require little, if any, modification. Section 252 makes provisions for testing and evaluation. Opening the SBIR program to test and evaluation is an incentive for PMs because results from T&E may be used to gauge the TRL of a SBIR project. As stated by participants, the TRL is more important to PMs than ongoing research.

This need for meaningful incentives was also reiterated by prime contractors. Prime contractors represented at the conference stated that they have focused management attention, shifted resources, and assigned responsibilities within their own management structures to capitalize on the creativity of SBIR firms and promote greater testing and evaluation (NAS, 2005, p. 28). Lockheed Martin also intended to build more formal business relationships with its small businesses, which are critical to successful Phase III transitions. This process must begin with joint visits to customers, when both sides can discuss product discriminators, areas for further investigation, and collaboration within Lockheed's own Independent Research and Development (IR&D) and Cooperative Research and Development Agreement (CRADA) technology culture. These relationships would also help integrate the SBIR technologies and firms and allow Lockheed to demonstrate its successes and build formal partnerships.

During the symposium, Dr. Kidalov, from the Senate Small Business Committee, lead a panel discussion on incentives for contracting with SBIR firms. Dr. Kidalov noted that in his experience, large prime contractors needed a champion, a corporate strategy, and incentives to continue using SBIR firms. He noted that these incentives need to go beyond the competitive advantages they provide. Dr. Kidalov asked the question of whether or not the panelists saw value in a system that would allow for recognition of efforts to contract with SBIR firms, perhaps from Congress and the government agencies. All panelists agreed.

Specifically, in response, a Boeing representative pointed out that incentives are built into contracts when agencies award them for many reasons, such as schedule and budget. He was pointing out that it should be possible to include similar incentives, such as those for working with SBIR firms. An ATK representative agreed that incentives were essential because primes, like PMs, were risk adverse by nature. Incentives would encourage them to take those risks.

A Raytheon representative was more specific in response to the question posed by Dr. Kidalov. He stated three incentives that would help the case to use SBIR firms. First, to streamline and otherwise optimize the SBIR process, which in turn would ensure the development of many technologies needed for the long term. Second, an assurance that customers have realistic plans to support the transition from Phase II through Phase III. Third, was an incentive that SBIR firms help meet the requirement to work with small disadvantaged businesses (NAS, 2005, p. 82).

Reform 3: Encouraging Innovation in Manufacturing

Section 252 mandates the full implementation of Executive Order No. 13329. The impact of Section 252 is that future presidential administrations cannot ignore this order. Executive Order No. 13329 was issued on February 24, 2004, by President George W. Bush. The goal of the order is outlined in the Introduction section, which stresses the importance of the federal government's role in encouraging technological innovation in the



U.S. economy. As part of that encouragement, the order specifically tasks the SBIR and SBTT programs with “helping to advance innovation, including innovation in manufacturing, through small businesses” (Executive Order No. 13329, 2004, section 1). The executive order required that heads of departments and agencies that have an SBIR or STTR program “give high priority within such programs to manufacturing-related research and development” (Executive Order No. 13329, 2004, section 2). The order places on department and agency heads a requirement to provide an annual report to the Small Business Administration and to the Director of the White House Office of Science and Technology Policy in which they are to report on their efforts in meeting this order.

An impact of the executive order issuance was that the U.S. Small Business Administration proposed amendments to the SBIR Policy Directive on May 19, 2005, to incorporate the goals of the executive order. Although the amendments to this policy directive were not finalized, the agencies themselves established their own implementation plans.⁵

Reform 4: Enhanced Testing & Evaluation

In order to address another issue that impairs SBIR projects from transitioning to Phase III, Section 252 clarifies the definition of what constitutes a commercial application. The clarification was necessary in order to remove barriers imposed by overly restrictive interpretations of Phase II and Phase III requirements. Therefore, the definition of a “commercial application” was expanded to include test and evaluation of products, services, or technologies for use in technical or weapons systems, and, further, awards for testing and evaluation of products, services, or technologies for use in technical or weapons systems may be made in either the second or the third phase of the SBIR and SBTT programs.⁶

Survey Methodology

Survey Goals

In order to assess effectiveness of efforts designed to increase Phase III implementation success rates, especially in regard to the development of Commercialization Pilot Projects (CPP), input was sought from program managers and experts within the military departments who are involved with the Small Business Innovation Research (SBIR) program. We asked 102 individuals to complete an online survey. The aim of the survey was to document the agency implementations and practice in regard to the Commercialization Pilot Program and other Section 252 reforms. With this information, it was then possible to identify what was being done to implement Section 252 and how each agency worked to meet the congressional intent of the CPP.

Survey Design

The survey focuses on seven main research questions from the Congressional Guidance Letter to USD(AT&L) Kenneth J. Krieg.

1. How did the DoD implement the new requirement in Section 252(a) for research focus of its SBIR and STTR programs?

⁵ For example, the Air Force, Navy, and Army have all issued directives for implementation.

⁶ See Section 252 of H.R 1815.



2. How did the DoD and each military department plan to involve acquisition program managers and program executive offices in SBIR/STTR topic selection and management to ensure that SBIR/STTR is integrated into the DoD's mission and its acquisition framework, as contemplated in Section 252(a), SBIR Commercialization Pilot Program, and Section 252(c), inclusion of testing and evaluation works as part of SBIR/STTR commercialization activity?
3. How did the DoD and each military department's acquisition program managers and program executive officers plan for post-SBIR/STTR funding, through the Program Objective Memoranda and other vehicles, to utilize SBIR/STTR technology resources in their acquisition process, as stated in Section 252(a), SBIR Commercialization Pilot Program?
4. How did the DoD and each military department plan and implement the SBIR Commercialization Pilot Program, and specifically what processes did these military Services and defense agencies develop and implement to ensure identification of optimal SBIR/STTR Phase I–II projects for accelerated transition through this pilot program?
5. What acquisition incentives and activities did the DoD and each military department deploy to accelerate the transition of SBIR/STTR technologies into the acquisition process through the pilot program?
6. What specific reporting requirements did the DoD and each military department impose on acquisition program managers, program executive officers, and prime contractors as part of the annual evaluative report to Congress, as outlined in Section 252(a)?
7. How did the DoD and each military department implement Executive Order No. 13329, Encouraging Innovation In Manufacturing, codified into law as part of Section 252(b)?

Survey Scoring

Respondents were asked two types of question: those requiring a positive or negative response or those requesting a response using a rating scale.

Respondents were also given the option of choosing, “Don’t Know” or “Not Applicable.”

Survey Subjects

All DoD agencies and departments participating in SBIR and STTR were asked to participate in the survey. Each point of contact was sent an e-mail with a request to participate in the survey and a link to the SurveyMonkey.com website where the online survey was posted. To refresh respondents recollection, the survey was supplemented with the text of the act and a copy of the Congressional Guidance Letter, issued jointly by the Chair and Ranking Minority Member of the Senate Committee on Small Business and Entrepreneurship and the Chair of the House Committee on Small Business. Point of contacts may have assigned additional respondents within their agency. Respondents were asked to identify their agency. Respondents' names and position within their agency were not collected.



Survey Limitations

The survey was primarily intended to ask responsible agency officials to identify practices and policies related to the reforms adopted by Congress and outlined in Section 252.

The data collected in the survey is therefore the primary source of the conclusions presented. No respondent actually completed the survey in total. This was partly by design, as a large number of the survey questions were only presented to the respondent depending on the previous answer.

The conclusions discussed in the following sections are based on results obtained when multiple responders provided the answers to the question being asked supplemented by reviews of publications and academic literature.

Survey Results and Analysis

Response Rate and Background Results

Organizations Participating and Background

We asked 102 individuals to complete the online survey. Of those 102, 19 responses were received, with the largest number of participants identified as being from Air Force organizations.

Partly as a result of the design of the survey to adjust the questions asked depending on the response to previous questions, no one participant completed all 30 questions within the survey.

The organizations responding and their response rates are shown in Table 1.



Table 1. Response by Organization

Invited Participant Organization	Participated?	Number of Responses
Office of the Secretary of Defense/Office of Small Business Programs	No	0
Army	No	0
Navy	Yes	3
Air Force	Yes	4
Missile Defense Agency	No	0
National Geospatial Intelligence Agency	Yes	1
Joint Science and Technology Office for Chemical and Biological Defense	No	0
Defense Advanced Research Projects Agency	No	0
Defense Microelectronics Activity	No	0
Defense Logistics Agency	No	0
Defense Threat Reduction Agency	No	0
Office of the Deputy Under Secretary of Defense (Science and Technology)	No	0
U.S. Special Operations Command	No	0
Commercialization Pilot Program Implementing Contractor – Army	No	0
Commercialization Pilot Program Implementing Contractor - Navy	No	0
Total Responses	3	8

Organizational Alignment of Regulations, Policies, and Procedures With SBIR and STTR Research Focus

Alignment of SBIR/STTR Topics With DoD Research Plans

Given an opportunity to respond to a question regarding the adoption of regulations, policies, or procedures necessary for compliance with the requirement in Section 252 for alignment of SBIR and STTR research topics with those set forth in the Joint Warfighting Science and Technology Plan, the Defense Technology Area Plan, and the Basis Research Plan of the Department of Defense, 50% of the respondents for the organization responded that their organization was not in alignment with the plan (Figure 1).

Of the respondents, 37.5% gave an affirmative response that their organization was in alignment with the plan.

There were 12.5% of the respondents who answered that they did not know if they had institutionalized SBIR/STTR topic alignment with the Section 252–identified DoD research plans in their organization.

When the results are broken down by organization (Figure 2), the Navy response indicated that it was more in compliance than any other agency, and the Air Force the least. Overall, all responding organizations indicated that they did not have the topic alignment required by Section 252, as was outlined previously in this paper.



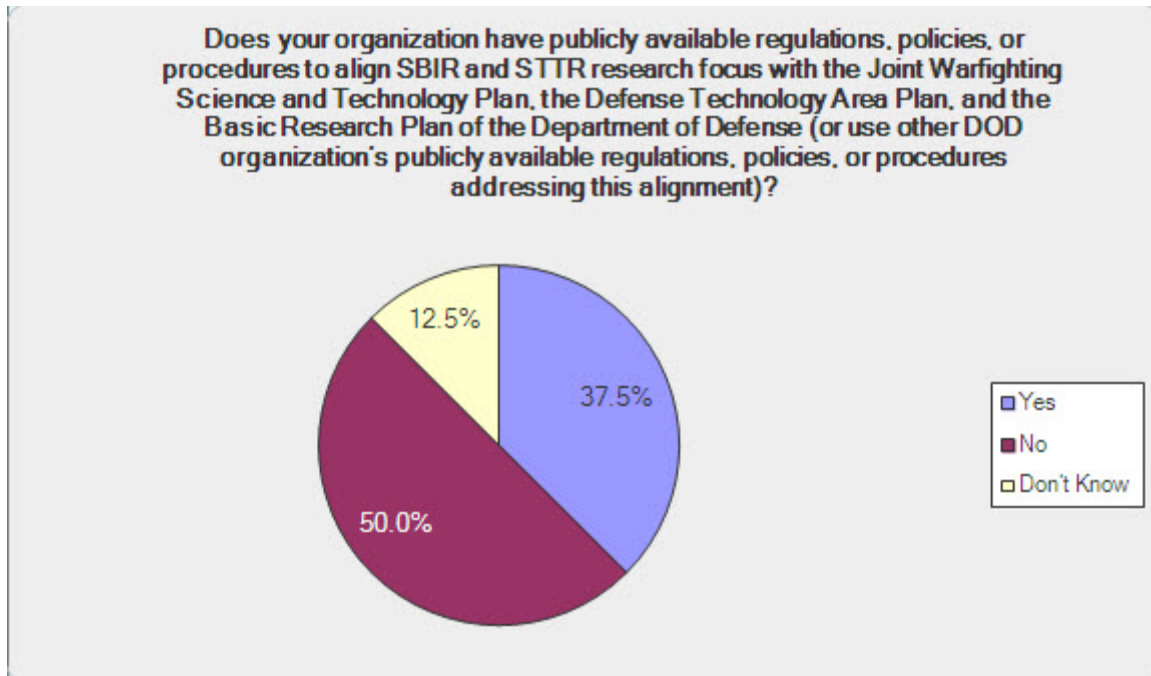


Figure 1. SBIR/STTR Policy Alignment With DoD Research Plans

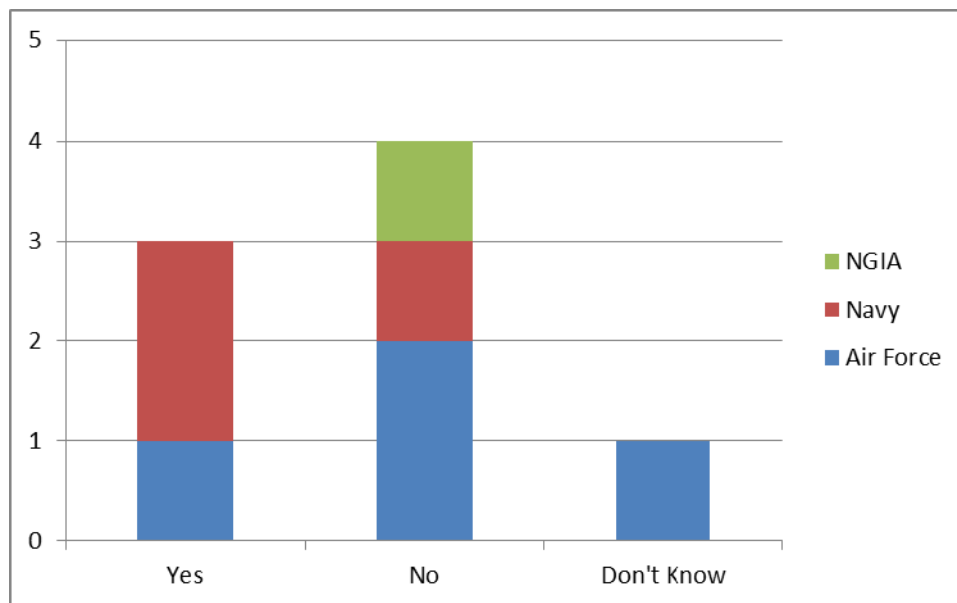


Figure 2. SBIR/STTR Policy Alignment With DoD Research Plans Response by Organization

Analysis. This finding is surprising as the Research Development Testing and Evaluation communities control the selection of SBIR/STTR topics in the Air Force (with some exception for space-related systems; GAO, 2010, p. 9), and Army, while the Navy approaches topic generation by the program offices (DoDIG, 2009). The Army and Air Force labs should be well aware of the defense science plans that are required for topic generation and the statutory requirements for generating those topics.

The conclusion that can be drawn from this data is that either the organizations are uninformed regarding the statutory alignment requirement, or they are aware but do not put the requirements in place. Further research would have to be conducted to determine which of the two conclusions is correct.

Alignment of SBIR/STTR Topics With DoD Research Plans—Program Manager/PEO Input

With a response of 50%, most respondents answered with a “not applicable” to the question as to whether there were regulations, policies, or procedures in place to provide for the input of program manager and/or program executive officers to determine the SBIR and STTR research and development (R&D) focus areas (see Figure 3).

In contrast, 37.5% of the respondents answered positively that there were regulations, policies, or procedures in place to provide input of program managers and/or program executive officers, as required by Section 252. There were 12.5% who answered that they did not know.

As shown in Figure 4, the response by organization to this question again shows the Navy indicating its compliance with Section 252, which calls for the input of program managers and program executive officers in the identification of areas of research and development of SBIR and STTR program areas of research.⁷ These results mirror those of the previous question.

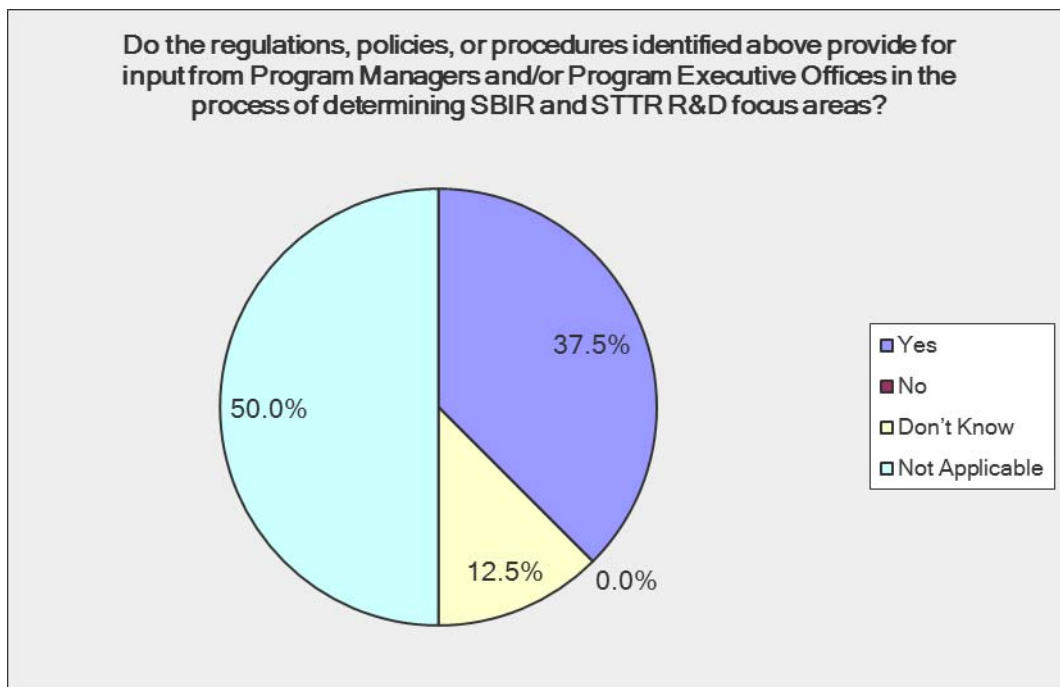


Figure 3. Program Manager/Executive Officer Input Into SBIR/STTR Focus Areas

⁷ This requirement is also more fully developed within paragraph 3 of the Congressional Guidance Letter.

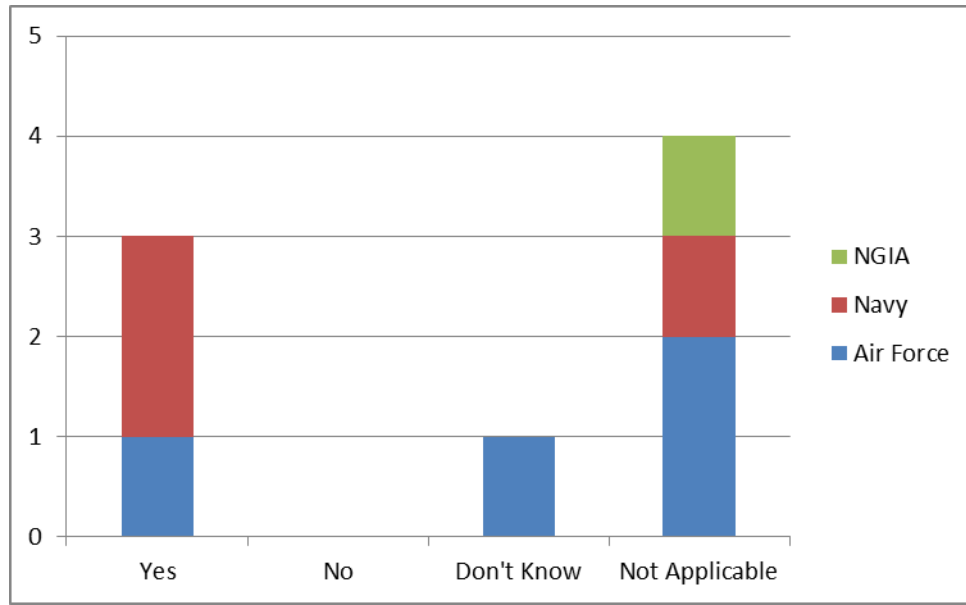


Figure 4. Program Manager/Executive Officer Input Into SBIR/STTR Focus Areas Response by Organization

Analysis. However much the response of the Navy organization shows its understanding of this section of the legislation, the overwhelming response by all organizations indicated that the involvement of program managers and program executive officers in determining focus areas was not applicable to their SBIR/STTR program implementation.

This finding is also surprising, especially since a 2006 memorandum from the Office of the Under Secretary of Defense (AT&L) issued the SBIR policy requiring “at least 50% of SBIR topics have acquisition community endorsement or sponsorship” (Krieg, 2006). As reported in the DoDIG report of January 30, 2009, which related the results of a Navy 2007 SBIR symposium, it was noted that the Navy writes SBIR topics that are closely aligned with the needs of the acquisition community for easier transitions of technology projects. As a result, Navy topics are less risky, and they transition to commercialization (Phase III) more easily than the topics developed by other means (DoDIG, 2009, p. 9). In addition to the success reported by the Navy, involvement of the acquisition community in topic generation was also recommended as a best practice in a congressionally mandated SBIR study conducted by the National Academy of Sciences (2009).

As was also noted in the DoDIG report, this requirement for involving the acquisition community members in the development of topics for SBIR/STTR projects may pose a problem for DARPA because their focus is not on “urgent needs and requirements” but rather on “radical innovations that may take years to prove feasible” (DoDIG, 2009, p. 10). Consequently, an area of further research may be how should an organization with a focus such as DARPA participate in SBIR/STTR topic generation, and what guidelines should be provided to smooth Phase III transitions for organizations that have a similar focus?

Again, additional research would have to be conducted to determine the reasons behind these responses were (i.e., ignorance of the requirement, or disregard).

Alignment of SBIR/STTR Topics With DoD Research Plans—Quadrennial Strategic Review

With a combined response rate of 75%, most respondents answered with a “don’t know” or “never participated” response to the question as to whether there was organizational participation in a Quadrennial Strategic Review of SBIR and STTR programs in accordance with the regulations, policies, or procedures that align topics with DoD research plans and program manager/program executive officer inputs to the same (see Figure 5).

Only a quarter, 25%, indicated that in either “most instances” or in “some instances” their organization participated in these reviews as required by Section 252 (a)(1).

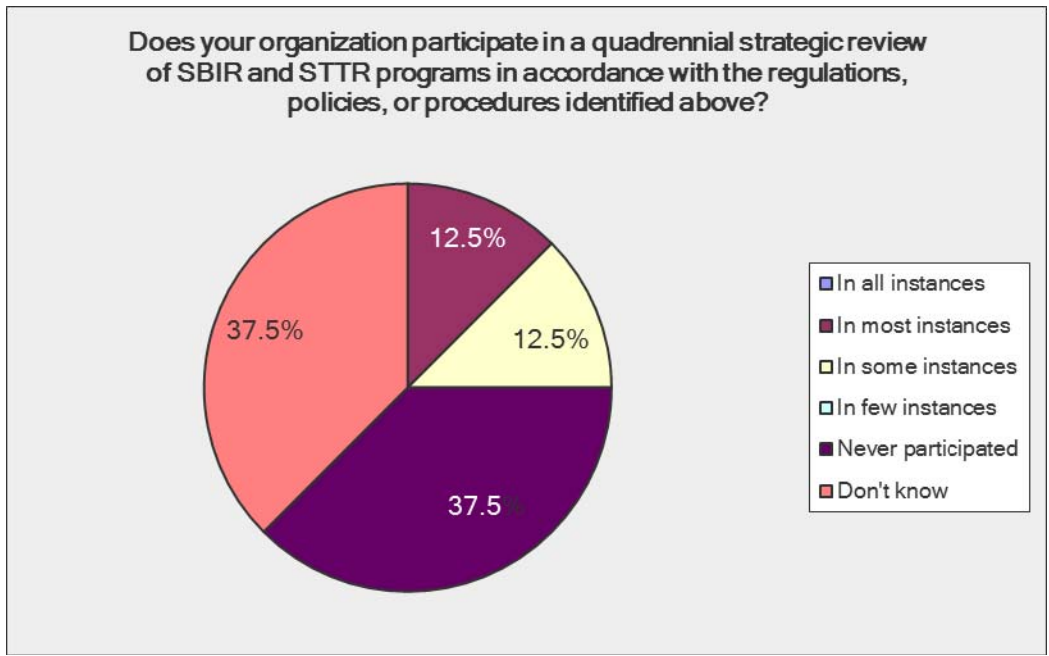


Figure 5. Response to Quadrennial Review

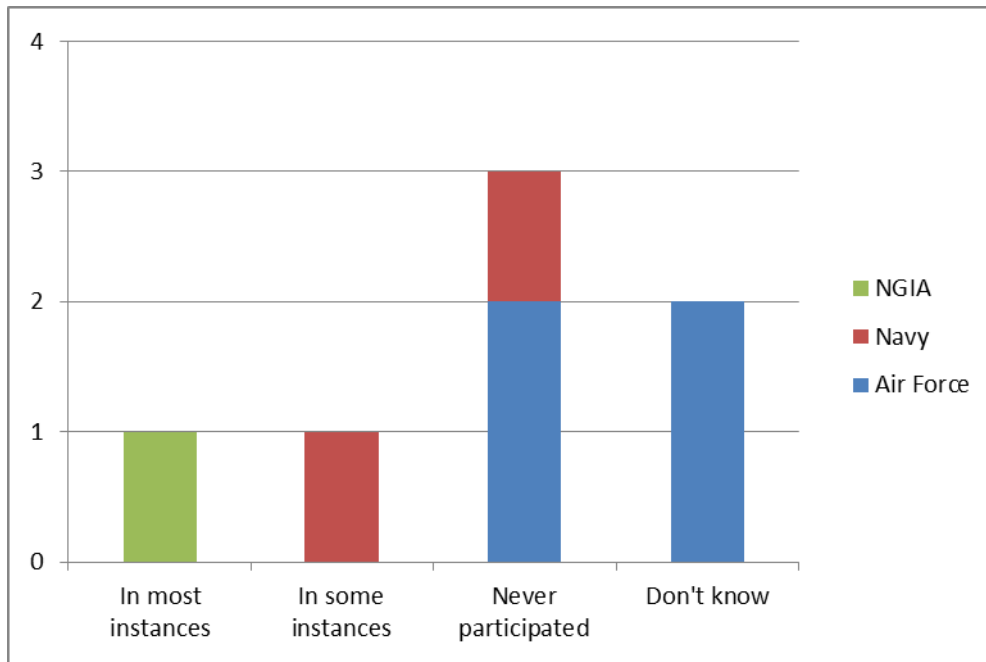


Figure 6. Response to Quadrennial Review by Responding Organization

Analysis. The organizational responses to this question were interesting. The Air Force responders either did not participate or didn't know if their organization participated in the Secretary of Defense Quadrennial Strategic Review. The Navy split between one respondent indicating that the organization had participated in some instances, and the other respondent indicated that the organization had never participated. One other Navy respondent did not provide any answer to the question.

Of interest also was the response from the NGIA, which responded that their organization participated in most instances. This response seemingly contradicts the responses from the previous questions in which they answered either in the negative or not applicable to those parts of the legislation that required alignment with DoD research plans and program manager/program executive officer input to the Quadrennial Strategic Review.

In any case, one can conclude from these results that the participation of the DoD organizations in the Secretary of Defense's Quadrennial Strategic Review of SBIR/STTR is low. Furthermore, during literature review for the purposes of this report, no information was found regarding the SBIR/STTR Quadrennial Strategic Review. This may be due to the nature of the review itself or—what is more likely in the opinion of the authors—that the Review has not been conducted as the legislation stipulates. The fact that since Section 252 was adopted, there have been two Quadrennial Defense Reviews, one in 2006 and the other in 2010, neither of which apparently had a Quadrennial Strategic Review conducted thereafter.

Creation of the Commercialization Pilot Program (CPP)

Creation of the Commercial Pilot Program (CPP)

Paragraph (y)(1) of Section 252 gives the Secretaries of Defense, Army, Navy, and Air Force the authority to create a Commercialization Pilot Program with the stated goal to



“accelerate the transition of technologies, products, and services developed under the Small Business Innovation Research Program to Phase III, including the acquisition process.” With a response of 62.5%, most respondents answered with an affirmative to the question as to whether their organization created the Commercialization Pilot Program (CPP; see Figure 7).

However, 25% of the respondents answered in the negative that their organization had not created the CPP, while 12.5% answered that creation of the CPP was “not applicable” to their organization.

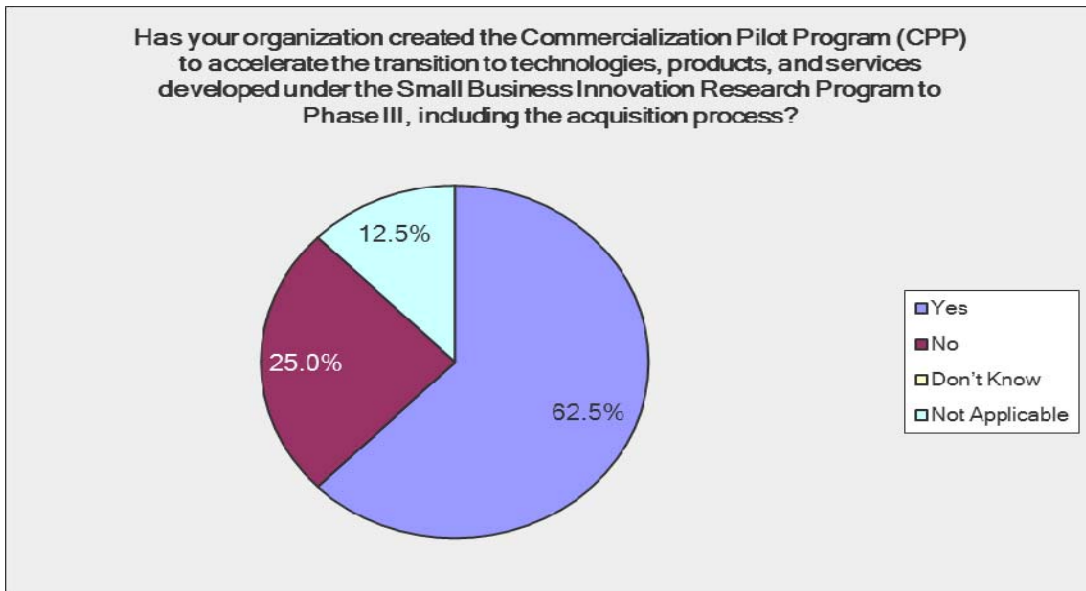


Figure 7. Response to Creation of the Commercial Pilot Program (CPP)

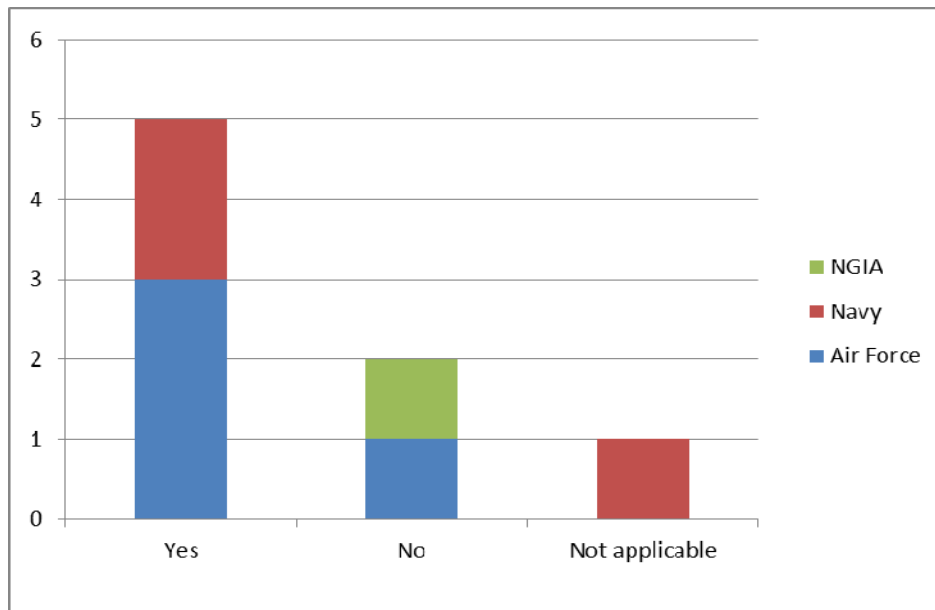


Figure 8. Response by Service to Creation of the Commercial Pilot Program (CPP)



Analysis. The majority of the military departments represented by the survey respondents indicated that they had created the Commercialization Pilot Program (CPP), with the Air Force slightly more responding in the affirmative than the Navy respondents (Figure 8).

The legislation's language allowed the departments to create this program; they were not required to do so by the legislation. However, if they did choose to create the CPP program, there were specific requirements that had to be followed because the CPP is self-funding. Whether the requirements were followed forms the basis for the next questions in this section.

In the case of the Navy, whether the CPP was created as a separate program is a subject of some conjecture. In a report done by the Navy SBIR program office titled *A Report on the Navy SBIR Program: Best Practices, Roadblocks, and Recommendations for Technology Transition* and released in 2008, it was stated, "One could argue that the Navy's SBIR program already meets the intent of the CPP legislation and we should continue business as usual" (Navy Small Business Innovation Research Program Office, 2008, p. iii). That study stated that the Navy's Transition Assistance Program (TAP) assists SBIR/STTR participants and helps to meet knowledge and support gaps by providing support to these program participants within Phase II in order "to help the SBIR firm delivery [sic] a technology product to DoD and the Navy" (p. 35).

In any case, the Navy does have what it calls "Phase II.5," which includes the TAP and refers to it as a CPP program (<http://www.navysbir.com/cpp.htm>). It utilizes self-funding set-asides for the CPP to pay for the Transition Assistance Program and has the System Command (SYSCOM) SBIR transition manager making the determination as to which firm gets invited to participate. In addition, each SYSCOM has its award structure and requirements to receive be selected for Phase II.5.

This paper does not attempt to make any determination as to whether the Navy SBIR program with the TAP and Phase II.5 component included does or does not meet the definition of the CPP; it is clear from the evidence presented previously that the Navy believes that this is the case. Rather, the presence of the TAP program may be confused with the CPP, which is why the Navy response seems to contradict itself. This, however, is not a semantic issue, as Section 252 has specific conditions on the usage of CPP funds.

In addition to the Air Force and Navy creation of the CPP, the Army, the Missile Defense Agency, and the Joint Science & Technology Office for Chemical and Biological Defense (JSTO-CBD), created CPP programs.

Commercial Pilot Program (CPP)—Identification of Projects for Rapid Transitioning Through CPP

With a response of 62.5%, most respondents answered with an affirmative to the question as to whether their organization had formal processes or procedures for the identification of optimal SBIR Phase I or Phase II projects for rapid transitioning and related assistance through the Commercialization Pilot Program (CPP) into Phase III and the acquisition processes, as required in Section 252 (y)(2) (see Figure 9).

Conversely, 25% of the respondents answered in the negative that their organization did not have the processes or procedures in place, and 12.5% answered that creation of the processes or procedures was "not applicable" to their organization.



The breakdown of the respondents to this question (Figure 10) mirrored that of the previous question: namely, the Air Force led the Navy in answering affirmatively to this question; the one NGIA and one Air Force respondent answered negatively; and the one Navy respondent answered as not applicable to their organization.

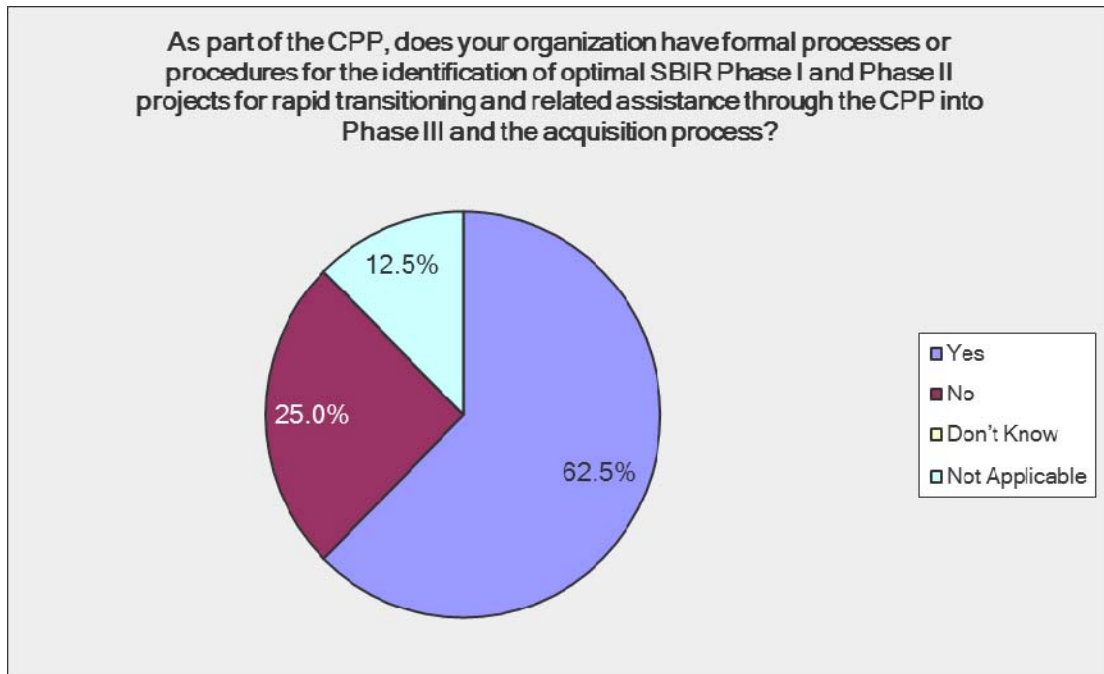


Figure 9. Response to Commercial Pilot Program (CPP) Identification of Projects for Rapid Transitioning Through CPP

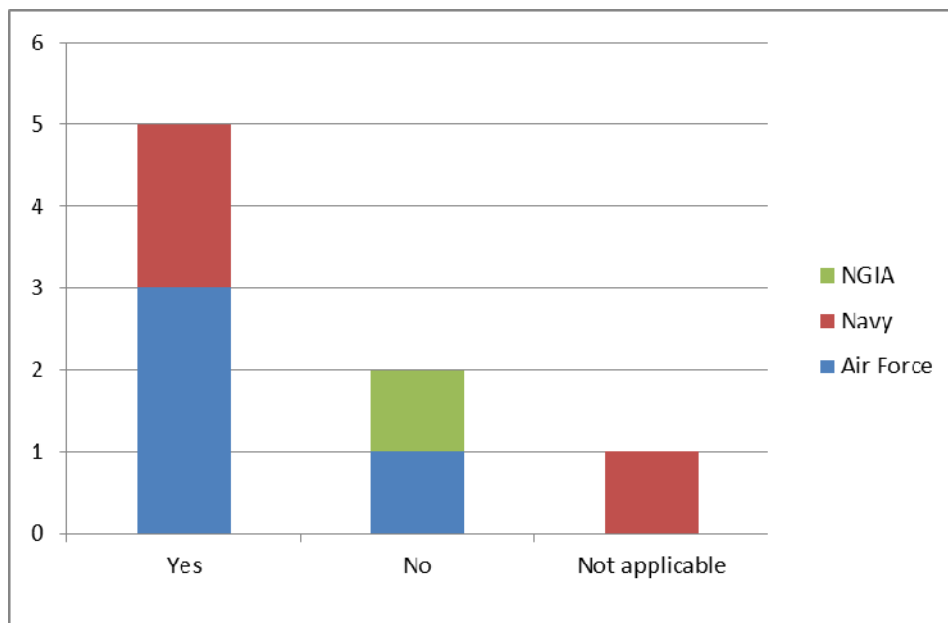


Figure 10. Response by Service to Commercial Pilot Program (CPP) Identification of Projects for Rapid Transitioning Through CPP

Analysis. On the whole, it can be concluded that most agencies that created the CPP came up with some sort of process for the identification of projects for rapid transitioning into the Commercialization Phase of the SBIR/STTR program. The negative responses to this question need to be viewed in the context of the previous question, namely that the respondents either did not create the CPP program in their organization, mixed up the CPP with other transition assistance programs, or were not clear about the legislative requirement.

To understand these results, one must look at the various CPP programs for their approach to identification. The Air Force approaches SBIR project identification for its CPP program using two approaches: technology needs identified by an Air Force acquisition organization and technology needs identified by a single major contractor. In both approaches, “data mining” of DoD Phase II databases occurred by Air Force experts at the various Air Force Product Centers and Air Force Research Lab. The experts look for promising candidates based on program executive office needs. The results of the search are then provided to major contractors of Air Force acquisition organizations, which then conduct interviews with the various small businesses during Industry Interchange Workshops. Then, the technical points of contact and the major contractors identify promising SBIR projects for inclusion into the CPP (Flake, 2007).

The Navy approach involves the program executive office and the System Command SBIR program manager and a technical monitor to decide which Phase II programs get included into their CPP program. Each System Command has its own identification processes relating to their areas of interest (<http://www.navysbir.com/cpp.htm>). Since 2008 the Navy has also participated with the Air Force in Joint DoD Component Industry SBIR CPP Technology Interchange Workshops, although recent resource constraints make Navy attendance in the future questionable.⁸

The responses also relate to how each Service conducts initial topic selection for the SBIR program. In earlier studies conducted by the RAND Corporation and reported in a 2009 DoDIG report, the approaches to topic generation—and, as a result, projects—of the various military departments was discovered and analyzed. According to the report, the Air Force and the Army “generated a majority of their topics in laboratories, whereas the Navy generated a majority of its topics through the acquisition program offices” (DoDIG, 2009, p. 10). The DoDIG’s report also concurred with the 2007 National Research Council report titled *SBIR and the Phase III Challenge of Commercialization* that the Navy approach to topic generation “expedited the transition to commercialization” (p. 9). Based on the current approach of the Army and Air Force, while there may have been improvements in the transition process of the respective CPP programs, the Navy model appears to provide for greater acquisition program input with regard to generating topics that will be successfully transitioned into DoD acquisition phases.

Commercial Pilot Program (CPP)—Certification of Technology Projects for Assistance by Department Secretary

With a response of 50%, most respondents answered that they did not know whether their organization required that SBIR Phase I and Phase II projects be certified by the Secretary of Defense or by the secretary of a military department that the project’s successful transition to Phase III and into the acquisition process is expected to meet high

⁸ Fact sheet available at <http://www.wpafb.af.mil/library/factsheets/factsheet.asp?id=15879>.



priority military requirements of the relevant department as a precondition for receiving assistance under the CPP (see Figure 11).

More than a third, 37.5%, responded that their organization never required the certification. Only 12.5% stated that their organization frequently requires the certification.

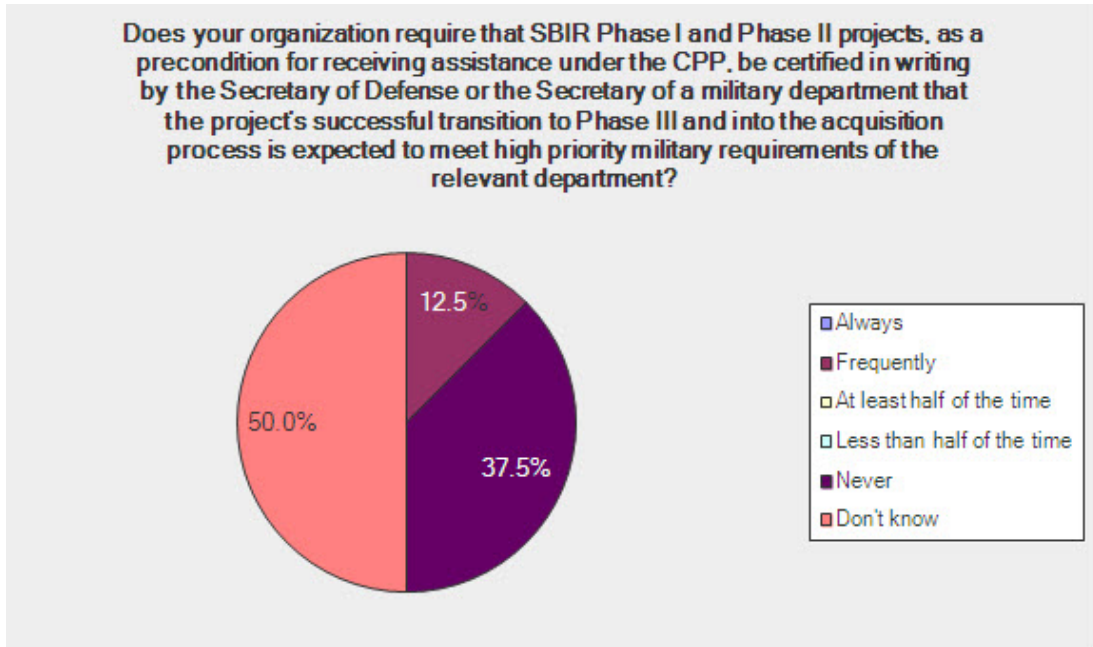


Figure 11. Response to Commercial Pilot Program (CPP) Certification of Projects by Department Secretary

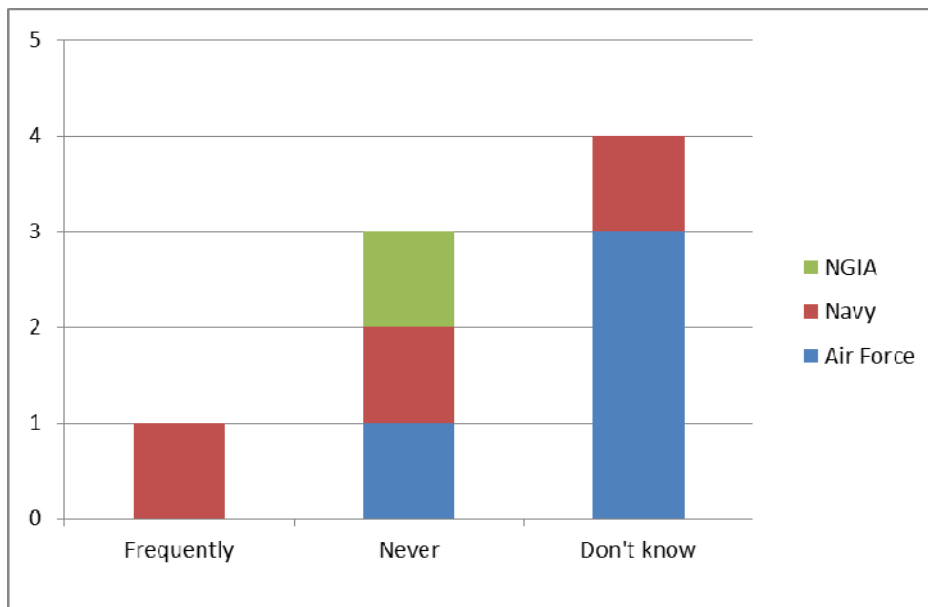


Figure 12. Response by Service to Commercial Pilot Program (CPP) Certification of Projects by Department Secretary

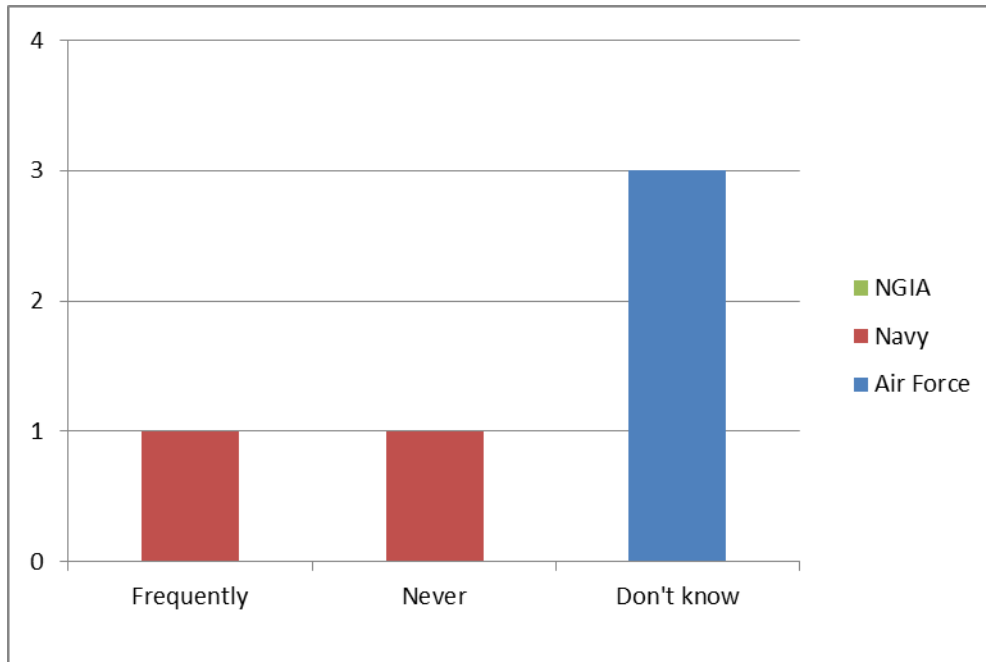


Figure 13. Response by Service to Commercial Pilot Program (CPP) Certification of Projects by Department Secretary (Adjusted for Removal of Non-CPP Responders)

Analysis. A casual look at the responses from the various Services to this question would indicate a large portion of the respondents' organizations either do not know if the organization is keeping this requirement or that they never have keep it (Figure 12).

When one removes the respondents who previously answered "never" or "don't know/not applicable" to the question of CPP creation from the results, one is left with a clearer picture of the situation (Figure 13).

This would indicate that the Air Force organizations, which are the most frequent respondents confirming creation of the CPP, do not know if their military department has implemented the requirement for certification in writing required in Section 252(y)(2).

One also sees the Navy being split on whether this is done in its department, with one respondent answering "frequently" and the other answering "never."

These responses indicate that there is another area for further research needing to be done to determine the type and nature of the responses to this question.

As was previously outlined and which will be further expanded upon later in this paper, the Air Force, Army, and certain Navy organizations utilize contractors such as MILCON Ventures Partners, MacAulay-Brown, Willcor and Dawnbreaker to assist in SBIR- and CPP-related projects at various phases. Some of these firms assist to the extent of helping government personnel to determine whether specific small business firms are able to participate in providing proposals to announced topics at Phase I and whether the Phase I and Phase II firms will be allowed to participate in the CPP projects. In these instances, these contractors do a "vetting" of technology needs and technology SBIR firms. The reason for the department secretary's certification as required in Section 252 was to make certain that projects seeking to progress through the CPP process into commercialization phases

met the “high priority military requirements” of each department.⁹ Whether contractors should be involved in making this determination is at the very least questionable since delegation of this function to contractors increases the potential for misalignment between military requirements and CPP assistance funds and makes the CPP less predictable for small business. As the results to this question show, this requirement is not being met. Further research into the role of contractors in the determination of project approvals needs to be addressed.

Commercial Pilot Program (CPP)—Input by Program Managers or Program Executive Officers

With a response of 75%, a majority of the respondents answered with an affirmative to the question as to whether their organization had formal processes or procedures for requiring program managers or program executive officers to provide input concerning SBIR topic generation and on accelerated integration of SBIR projects into the acquisition programs (see Figure 14).

The last quarter was evenly split between the respondents who answered in the negative that their organization did not have the processes or procedures in place and who answered that creation of the processes or procedures was “not applicable” to their organization.

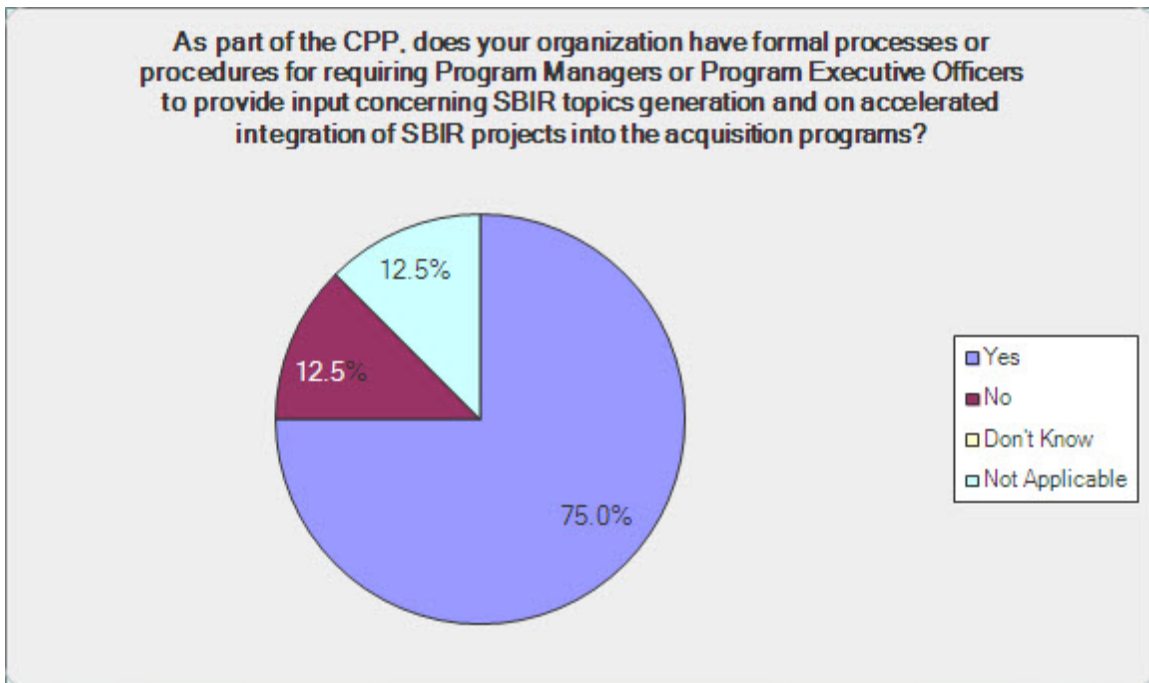


Figure 14. Response to Commercial Pilot Program (CPP) Input by Program Managers or Program Executive Officers

⁹ Section 252 (y)(2).

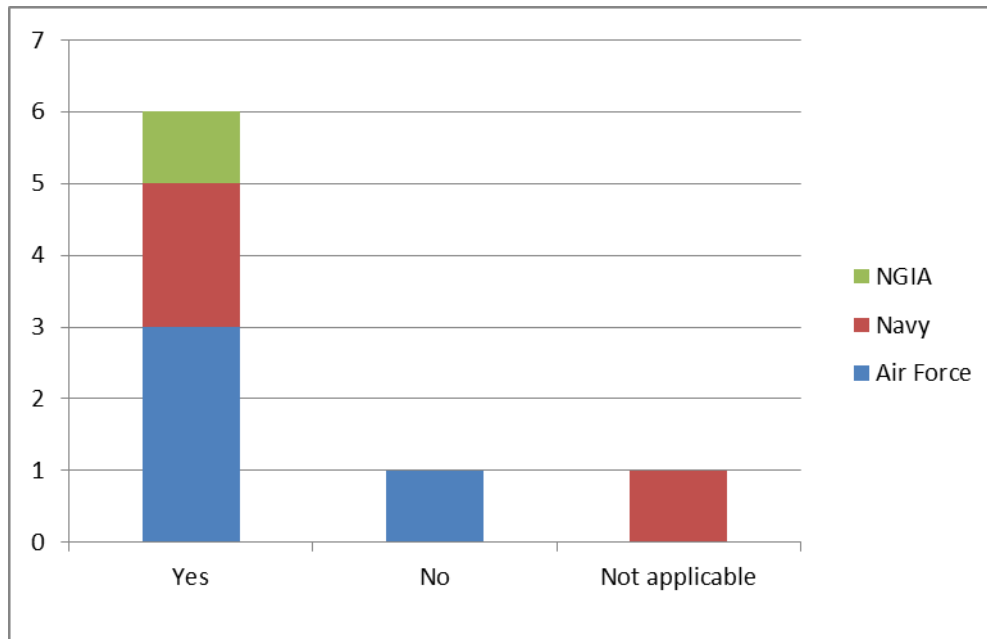


Figure 15. Response by Service to Commercial Pilot Program (CPP) Input by Program Managers or Program Executive Officers

Analysis. The responses by Service to this question (Figure 15) indicate whether their organization is in adherence to the requirements of the statute. However, the NGIA respondent who had previously indicated that their organization had not created the Commercialization Pilot Program still answered affirmatively that they had formal processes or procedures for program manager or program executive officer input as part of the CPP.

Even when taking into account the seemingly erroneous response discussed above, the conclusion here is that the organizations are largely, but not always, involving the PEO and PMs in topic generation within the context of the CPP. This is in contrast to the responses given to the question regarding PEO and PM involvement in topic generation in general reported in the section titled Alignment of SBIR/STTR Topics With DoD Research Plans—Program Manager/PEO Input. In that section, recall that over 50% of the respondents answered that involvement of the PEO and PM was “not applicable.”

The involvement of program executive officers and program managers is critical in the topic generation and identification of projects into commercialization. In a 2009 study entitled *An Assessment of the Small Business Innovation Research Program at the Department of Defense*, the National Academies of Sciences identified that “active championing (of SBIR projects) by Program Executive Officers seems to be a critical ingredient in Phase III success” (p. 182). The study also suggested having senior managers insist that all program managers “integrate SBIR fully into their acquisition programs” (p. 183). These two recommendations represent a cultural change component that Section 252 tried to achieve by requiring PM/PEO input in identifications of areas of effort and by reporting out of the activities of the program managers, program executive officers, and prime contractors in the form of the annual evaluative report on the CPP.

Another issue that involves program managers and program executive officers is that of topic generation. According to the Government Accountability Office (2010) report *Space Acquisitions: Challenges in Commercializing Technologies Developed under the Small*

Business Innovation Research Program, small businesses that were involved with SBIR projects in DoD space related technologies related that there was limited “pull” from the acquisition programs (p. 23). According to the report, three reasons were given for this lack of “pull”: DoD topics in which there is no validated requirement, short tenure among DoD officials responsible for progress, and lack of SBIR knowledge among DoD officials (p. 23). Certainly, topic generation by the program managers and program executive officers should include validated requirements and be within the ability of the senior leadership to enforce. Lack of SBIR knowledge is being addressed through more SBIR-related training. Still, the issue of “pull” is again related to changes in organizational culture that apparently remains difficult to accomplish within the DoD.

Contractor Influence on Selection of Projects Within the Commercialization Pilot Program (CPP)

Commercial Pilot Program (CPP)—Contractor Influence

With a response of 83.3%, most respondents answered that their organization did not make decisions to select SBIR Phase I or Phase II projects for CPP assistance based on or influenced by contractors supporting the CPP program for the organization (see Figure 16).

However, 16.7% stated that their organizations’ decisions to select SBIR Phase I or Phase II project was in some way influenced by one or more contractors supporting the CPP program for the organization.

With the exception of one respondent from the Air Force, all other Services, including all other Air Force respondents, indicated that contractor influence on decisions to select Phase I or II projects for CPP does not occur (see Figure 17).

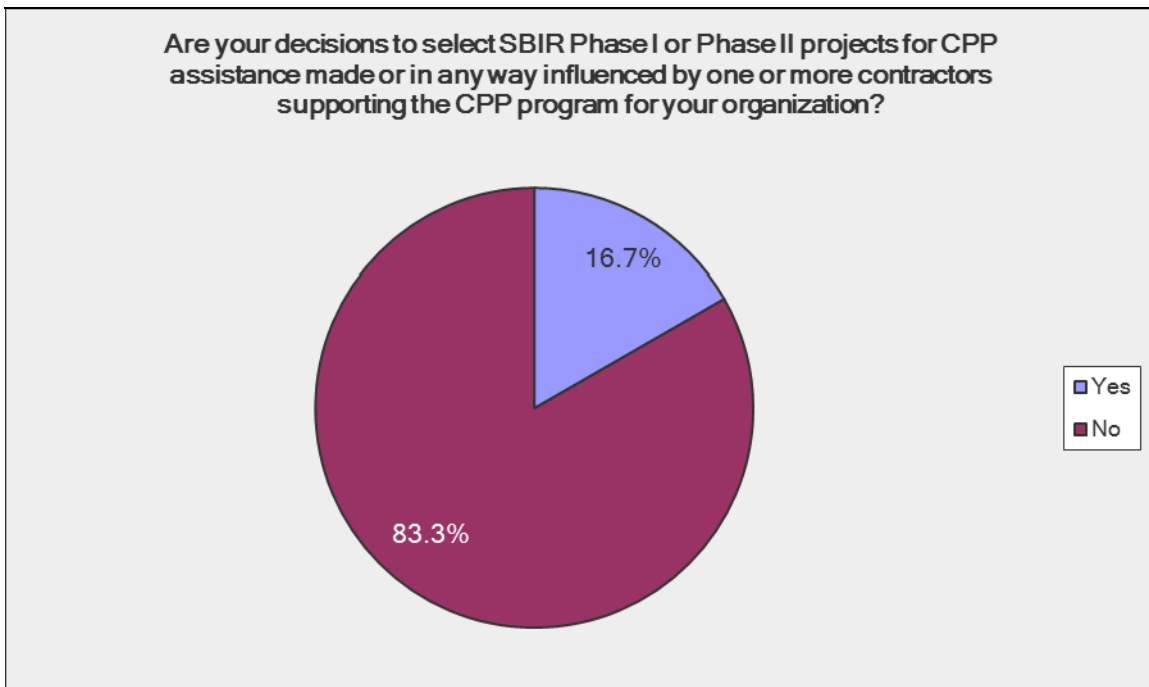


Figure 16. Response to Commercial Pilot Program (CPP) Contractor Influence

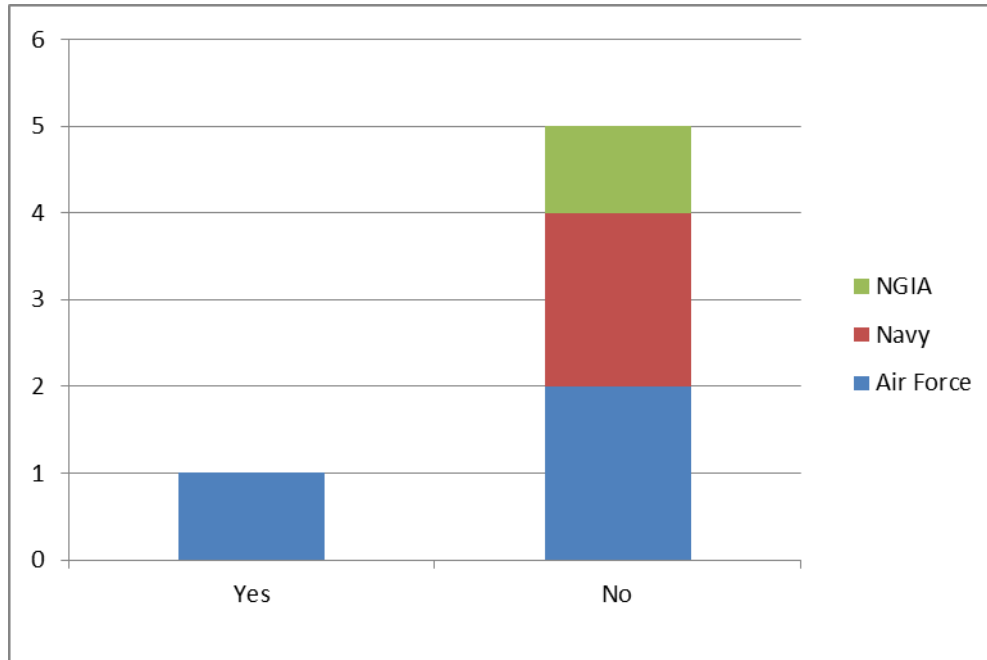


Figure 17. Response by Service to Commercial Pilot Program (CPP) Contractor Influence

Analysis. This finding is in contrast to the publically announced role of contractors in the various CPP programs. With the passage of the SBIR Reauthorization Act of 2000 (Public Law 106-554), which amended Section 9 of the Small Business Act (15 U.S.C. 638), federal agencies were allowed to enter into an agreement with a vendor to provide “technical services.” The text of the section is as follows:

(q) Discretionary technical assistance

(1) In general

Each Federal agency required by this section to conduct an SBIR program may enter into an agreement with a vendor selected under paragraph (2) to provide small business concerns engaged in SBIR projects with technical assistance services, such as access to a network of scientists and engineers engaged in a wide range of technologies, or access to technical and business literature available through on-line data bases, for the purpose of assisting such concerns in—

(A) making better technical decisions concerning such projects;

(B) solving technical problems which arise during the conduct of such projects;

(C) minimizing technical risks associated with such projects; and

(D) developing and commercializing new commercial products and processes resulting from such projects.

(2) Vendor selection

Each agency may select a vendor to assist small business concerns to meet the goals listed in paragraph (1) for a term not to exceed 3 years. Such selection shall be competitive and shall utilize merit-based criteria.¹⁰

Using the text of the law as a standard, the role of contractors in the CPP program can be examined. For example, within the Army, MILCOM Venture Partners is a firm that the Army selected to oversee its CPP implementation. The following information was found on their website (www.milcomvp.com) and describes their role in the Army CPP program:

MILCOM Venture Partners (MILCOM) was selected as the Army's contractor to help manage the CPP, and will: 1) review current SBIR Phase II projects and recommend approximately 25 projects for participation in CPP; 2) provide assistance intended to accelerate technology transition and commercialization to the projects selected for CPP participation; and 3) recommend the amount of additional funding each participating SBIR Phase II project will be allocated from the \$15 million CPP fund. In making recommendations for participation in CPP, the following characteristics will be given significant consideration by MILCOM:

1. The Phase II technology meets a high priority Army requirement;
2. The technology can be rapidly transitioned to Army acquisition and/or a commercial product; and,
3. Transition to military or commercial products will provide a significant financial return on the investment made in the technology by the SBIR Program, in the form of non-SBIR investment in such technology and product revenue.

The Air Force has contracted with MacAulay-Brown, Inc. (MacB) to provide a lead role, variously described as that of SBIR/STTR program manager¹¹ or, more recently, as SBIR/STTR project lead (<http://www.afsbirsttr.com/Poc/Pocs.aspx>). The role of MacAulay-Brown was described in their press release at the time of the contract award:

The Government-MacB Team will focus on improving the process of identifying and developing topics that address urgent warfighter needs and transition successful results to acquisition programs while strengthening awareness, involvement and advocacy of key S&T customers/stakeholders.
(<http://www.macb.com/about-us/company-news.php>)

The Navy also involves contractors to assist in their CPP program. The contractor firms Dawnbreaker Inc., and Willcor have been contracted to provide program management support, technology transition, and risk management to firms that have SBIR/STTR projects. The firm's involvement in CPP is outlined as follows:

- Willcor is under contract to the Navy to assist companies with the use of Technology Risk Identification & Mitigation Software (TRIMS) for SBIR, a web based tool for risk assessment management, the performance of independent

¹⁰ The full text can be retrieved at http://www.law.cornell.edu/uscode/html/uscode15/usc_sec_15_00000638----000-.html#FN-1.

¹¹ Air Force presentation given at the 2009 Beyond Phase II Conference ([http://www.beyondphaseii.com/2009/presentations/Wednesday/01_CPP_Service_Briefings/c_Services_Briefings-Flake_\(Air_Force\).pdf](http://www.beyondphaseii.com/2009/presentations/Wednesday/01_CPP_Service_Briefings/c_Services_Briefings-Flake_(Air_Force).pdf)).



assessments, and assistance in developing risk mitigation strategies and plans.

- Both Willcor and Dawnbreaker are under contract with the Navy to provide assistance to SBIR firms in planning their transition strategies.
- Both Willcor and Dawnbreaker are under contract to assist firms with identifying issues, preparing manufacturing plans, and conducting Manufacturing and Production Readiness assessments.
- Technology Readiness Assessments are used to assist firms in determining the development status of their technology (TRL) as well as conformance to requirements. Willcor is under contract to the Navy to provide these assessments. (http://www.navysbir.com/Navy_CPP-09.pdf)

Dawnbreaker's role within the Navy's Naval Air Systems Command (NAVAIR) CPP program includes having

to provide Program and Technology Transition Management Support to the NAVAIR SBIR Program Office to implement a CPP which assists the NAVAIR Program Executive Officers (PEOs) and NAVAIR Acquisition Program Management Offices (PMAs) in identifying SBIR topics that meet the needs of the war-fighter, have the potential for rapid transition and to execute their transition from Phase II to Phase III and insertion into a Program of Record. (<http://www.dawnbreaker.com/defense/navair-cpp.php>)

Dawnbreaker is also the major contractor in the Navy's Technology Assistance Program (TAP). This program assists Phase II SBIR/STTR awardees with "the services of a business acceleration manager, a market researcher, and others to accelerate the transition of their technology. This is accomplished through the application of a proven process and deliverables, developed collaboratively by the small business and the Navy TAP team" (<http://www.dawnbreaker.com/defense/navy-tap.php>).

It is clear that there is significant contractor involvement in the CPP programs at the various Services. What is not clear, however, is whether any conflict of interest with Federal Acquisition Regulation provisions and the various programs exist. This is significant because FAR Section 9.5 prohibits a contractor from having consultant conflicts of interest. FAR Section 9.505-1 specifically prohibits a contractor that has "provide(d) systems engineering and technical direction for a system but does not have overall contractual responsibility for its development, its integration, assembly, and checkout, or its production" from having a contract awarded to them for the system or to be a subcontractor or consultant to a supplier of the system or any major components. While the scope of the involvement of the contractors outlined above does not appear to be in conflict with the above quoted section, there may be some unintentional abuses and possibly the role that contractors are actively playing exceeds that of the definition of "technical assistance" as was outlined in 15 U.S.C. 638. The conclusion here is that this is an area in which more research should be conducted.

CPP Incentives and Initiatives

Incentivizing Within Commercial Pilot Program (CPP)

With a response of 66.7%, most respondents answered that their organization did not make develop or deploy acquisition incentives to accelerate the transition of SBIR/STTR



technologies into the acquisition process through the Commercial Pilot Program (see Figure 18).

A third, 33.3%, indicated that their organization did develop and deploy acquisition incentives to accelerate the transition of SBIR/STTR technologies into the acquisition process as part of the CPP.

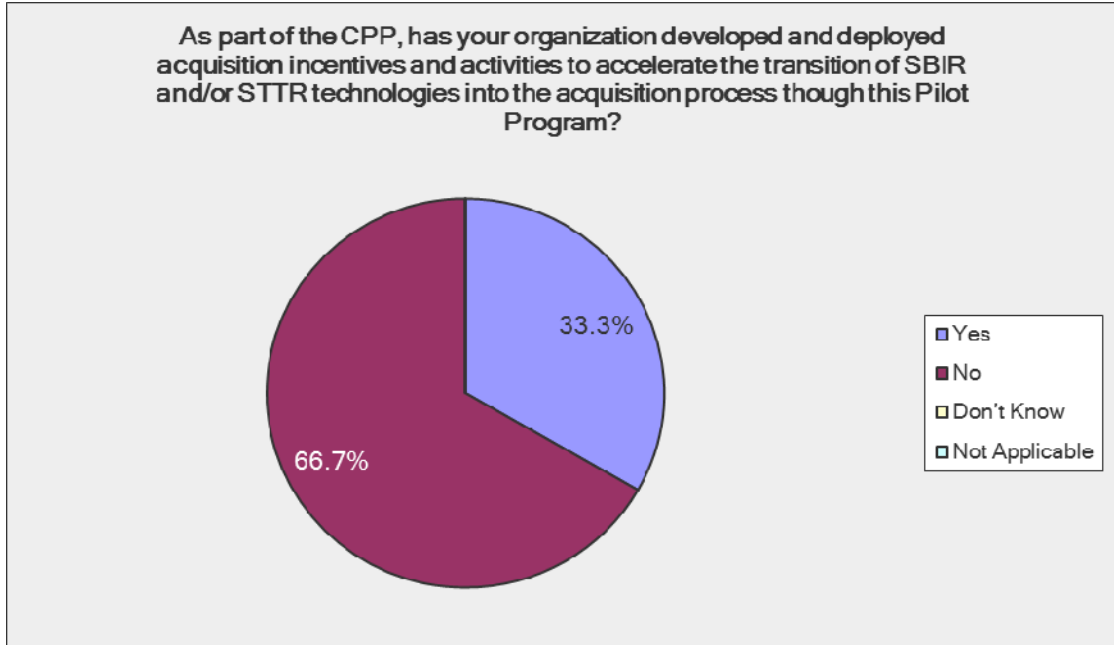


Figure 18. Response to Acquisition Incentivizing Within Commercial Pilot Program (CPP)

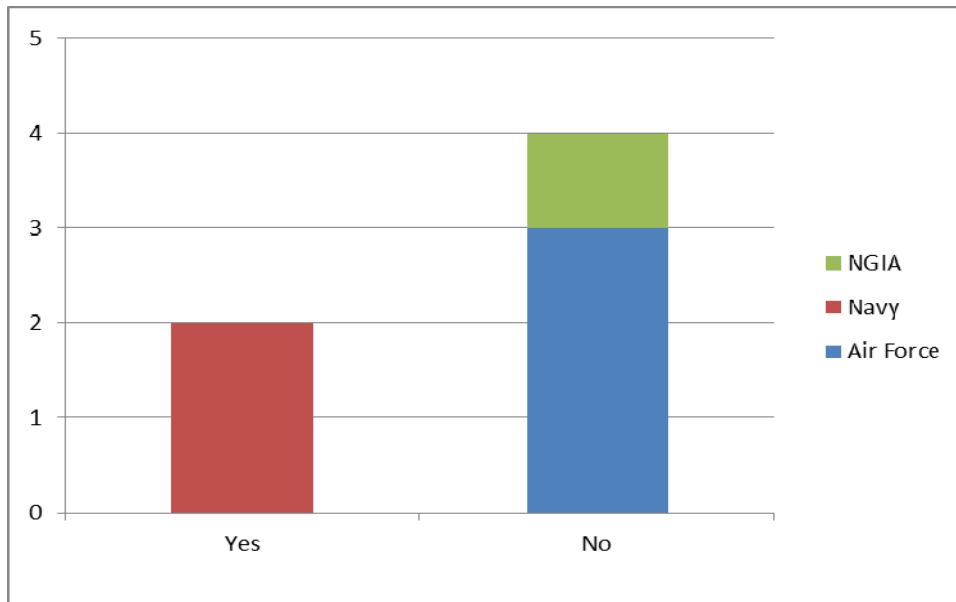


Figure 19. Response by Service to Acquisition Incentivizing Within Commercial Pilot Program (CPP)

Analysis. The two Navy respondents who had confirmed creation of the CPP also were the only respondents who indicated that the Navy used incentives within the Commercialization Pilot Program. The Air Force respondents indicated that the Air Force did not develop any acquisition incentives, even though this is well within the scope of the SBIR/STTR program and must be reported to Congress each year (see Figure 19).

The subject of incentives was a topic of great interest at the SBIR and the Phase III Challenge of Commercialization Symposium held on June 14, 2005. The symposium was convened by the National Academies of Science (2005) and focused on the commercialization of SBIR-funded innovation projects at the DoD and NASA (p. xv). The term “incentives” was used to address methods of change techniques with the various targets being government managers at multiple levels, prime contractors, and small businesses. The ideas suggested took the form of programmatic changes to funding, training, risk reduction (for all three entities, small business, prime contractor and government), alignment with existing projects, and education outreach regarding the SBIR program. The importance of incentives was stressed repeatedly by the participants of this symposium, and within the report of the proceedings this is evidenced by the following two quotes:

In this era of globalization, optimizing the ability of small businesses to develop and commercialize new products is essential for U.S. competitiveness and national security. Developing better incentives to spur innovative ideas, technologies, and products—and ultimately to bring them to market—is thus a central policy challenge. (NAS, 2005, p. 3)

To capitalize on SBIR’s potential, both better information (for small companies and large prime contractors) and supportive incentives are necessary. (NAS, 2005, p. 28)

Section 252 utilizes the term “incentives” specifically in paragraph (y)(5) with regard to the reporting of such in the annual evaluative report of the Secretary of Defense to the Senate committees on Armed Services and Small Business and Entrepreneurship and House committees on Armed Services and Small Business, but the Congressional Guidance Letter gives further instruction with regard to the intent of Congress to have the DoD consider issuing “binding directives, contract clauses, or regulatory amendments through the Defense Federal Acquisition Regulation Supplement (DFARS) to facilitate the requisite incentives” (p. 3).

In the 2006 SBIR CPP Report to Congress, the Department of Defense stated its intention to utilize incentives:

The Department is exploring a range of incentives to stimulate the transition of SBIR funded technology for promulgation throughout the Department via appropriate mechanisms. Initiatives under consideration include: extension of SBIR Phase III permissive sole-source authority to SBIR subcontracts, reinforcement of SBIR Phase III sourcing authority and data rights, formal consideration of SBIR technology transition planning during acquisition review processes, favorable treatment of proposals which employ SBIR technologies or partnerships, use of incentive or award fees for SBIR-technology sourcing; wider employment of SBIR Phase III contracts toward meeting small business sourcing goals, to include possible multiple small business credits; and encouraging individual performance bonuses for personnel affecting SBIR technology transition. The new National Security Personnel System (NSPS) in the process of



being rolled-out across the Department is well suited to implement this type of performance-based compensation. It will be up to each participating component and their subcomponents to take advantage of this opportunity to set output-based goals to measure this dimension of performance for relevant program officials while ensuring the integrity of source selection activities. (USD[AT&L/OSBP], 2007, p. 13)

The lack of reported incentive usage would indicate a missed opportunity by the Services. The different approaches to incentives as well as the level of utilization can be found in Table 2.

Incentivizing Within Commercial Pilot Program (CPP)—Types of Incentives Deployed

Since the Navy respondents were the only ones who indicated the usage of incentives, all of the information in Table 2 is related to usage of the incentives within the Navy organizations, but the table also includes all of the types of incentives that could be utilized.

As shown in Table 2, the most utilized incentives were as follows:

- educational and business development assistance to SBIR firms focused on commercialization in federal and dual-use markets, and
- outreach and advocacy with large prime contractors as well as defense acquisition and program management officials.

And while having a high utilization, not used as frequently as the two above was the following:

- contract clauses or regulatory provisions expressly confirming SBIR data rights protections at Phase III at the prime contracting and subcontracting levels. Such clauses are set forth in FAR 52.227-20.

In contrast, the least utilized incentive method was that of contract incentive clauses and bonuses to large prime contractors that integrate SBIR and/or STTR technologies.

An area of additional research might therefore be the use of contract clauses or incentives to increase the transition of projects into Phase III as large prime contractors specially requested in the National Academies of Science SBIR Symposium (2005, p. 27). It is also worth studying whether funding currently spent in outreach and education may be more effective when redirected to these types of incentives.

Table 2. Response to Acquisition Incentivizing Within Commercial Pilot Program (CPP) Types of Incentives Deployed

Which type of incentives and activities did your organization develop and deploy as part of the CPP? (Select all that were utilized and indicate frequency of use)							
Answer Options	Always	Frequently	At least half of the time	Less than half of the time	Never	Response Count	Utilization
a. Educational and business development assistance to SBIR	1	1	0	0	0	2	Most utilized



firms focused on commercialization in Federal and dual-use markets							
b. Outreach and advocacy with large prime contractors as well as defense acquisition and program management officials.	1	1	0	0	0	2	Most utilized
c. Contract incentive clauses and bonuses to large prime contractors that integrate SBIR and/or STTR technologies	0	0	0	1	0	1	Least utilized
d. Mentor-protégé arrangements for the benefit of SBIR and/or STTR firms	0	0	1	1	0	2	Some utilization
e. Dedication of specific acquisition dollars for integration of SBIR and/or STTR technologies into major defense systems	0	0	1	1	0	2	Some utilization
f. Contract clauses or regulatory provisions expressly confirming SBIR data rights protections at Phase III at the prime contracting and subcontracting levels	1	0	1	0	0	2	Most utilized
g. Performance incentives to acquisition and program management personnel for developing and execution rapid commercialization of SBIR technologies through government contracts and subcontracts	0	1	0	1	0	2	Some utilization



Conclusions and Recommendations

The overall conclusion of this paper is that while the Department of Defense began implementation of the DoD SBIR CPP program and other Section 252 SBIR/STTR reforms, progress is uneven. Specifically, military departments (MILDEPs) and DoD agencies participating in SBIR and STTR programs have not uniformly conformed to the mandatory Section 252 reforms. When the Departments of Defense, Army, Navy, and Air Force implemented the optional Commercialization Pilot Program, they commonly used the CPP funds to hire business development and venture capital contractors as transition assistance advisers. Although transition assistance advising is recognized by the Congressional Guidance Letter as a valuable form of assistance, the DoD and MILDEPs seemed to disregard several other CPP elements that were expressly spelled in the statute. For instance, the departments have largely not fulfilled the condition of secretarial certification of high military priority before technologies can qualify for CPP assistance, and have declined to implement the CPP incentive authorities to the maximum extent practicable. Unquestionably, the CPP informs the DoD acquisition community about valuable SBIR technologies and helps SBIR firms engage in planning for SBIR technology insertion within the DoD. However, as currently implemented, the CPP is not likely to significantly streamline the Phase III transition process, to change the culture of major acquisition program offices with regards to SBIR, to reduce technology insertion risk, or to incentivize leading prime contractors to utilize SBIR firms in major defense systems. Legislative reforms are needed to rebalance and strengthen the CPP and other Section 252 reforms.

Answers to Research Questions

Alignment with DoD Research Plans

The conclusion we reach to the question as to whether the military Services have aligned their SBIR/STTR topics with DoD research plans, which would include PM/PEO inputs to couple acquisition focus with research needs and have these certified by the respective military secretaries, is that this has not occurred at all. This is the case even though the Section 252 legislation and Under Secretary of Defense SBIR policy requires that this occur. We are left with trying to determine an explanation for why this could have been the case. Taking a positive perspective on this subject, we suggest that either there is a level of ignorance of the statute and policy, which can be remedied by education and management actions, or that the respondents just did not know the answer to the survey questions. On the other hand, this may also suggest that there is resistance in the DoD organization to taking a new approach to topic creation. This, in turn, indicates a challenge to an organization's culture, which will be more difficult to change, but not impossible, when combined again with education and a strong influence from upper levels of management. In any case, the responses to this question would indicate that opportunities for further research exist in trying to determine why the respondents answered in the way they did and to effect change leading to alignment.

Commercialization Pilot Program

The conclusion we reach as to whether the Commercialization Pilot Program was created and was conducted within the requirements of Section 252 is a qualified yes. The Services reported, and documentary evidence exists for the Army (which did not participate in the survey), that there has been a CPP created in each of the major military Services and that there is largely input by program managers/program executive officers in the selection



of SBIR/STTR projects to be included in the CPP. The overall implementation of the Commercialization Pilot Program was positive, but suffered from the seeming ignorance of the secretarial certification reporting requirements of the legislation, the potential inappropriate use of contractors resulting in their performance of roles that are governmental functions, and the low utilization of incentives. These findings were the negative aspects of the answer. Those Services that did implement the CPP seemed to pick and choose which requirements within the legislation they would implement.

As mentioned previously, our research has shown that there had been contractors performing some of the functions that were delegated to the department secretary, including the certification process to determine which projects are to be given assistance. Contractor participation in the certification process and the approach to use contractors as “gatekeepers” within SBIR Phase I and II projects shows that contractor influence in those military Service’s SBIR/STTR CPP programs is organic—perhaps not by design, but nevertheless is present throughout. This may create issues in the CPP decision-making process, leading to misalignment of CPP resources. We suggest that additional research be performed to look at this issue and to make certain governmental functions are being performed by the proper government authorities, as well as to erect barriers to potential areas of conflict of interest.

Our research also showed the lack of incentives being utilized within the DoD SBIR/STTR CPP. As was noted in the Department of Defense report to Congress on the Commercialization Pilot Program Report for Fiscal Year 2006, the DoD stipulated that it would undertake an exploration of the use of incentives to encourage the transition of SBIR technologies throughout the DoD. Four years later our research has determined that incentive use is almost non-existent and that incentive usage should be emphasized or re-emphasized to the Services. This is an area in which more research should be conducted to ascertain the apparent resistance of the Services to incentivizing SBIR participants.

Promotion of Manufacturing Innovation

Our survey did not succeed in collecting responses to how the Services and the DoD in general performed the implementation of Executive Order No. 13329. What we did find by doing literature review shows that the Services have posted plans on how to encourage manufacturing in their respective SBIR/STTR programs at publically available websites. The Executive Order No. 13329 webpage on the DoD SBIR/STTR site lists links to the Army’s, Navy’s, Air Force’s, and DARPA’s Executive Order No. 13329 Manufacturing Innovation Plans (<http://www.acq.osd.mil/osbp/sbir/execorder/index.htm>).

This report does not make any conclusions regarding these efforts and suggests that further research be conducted to ascertain compliance with Section 252 and congressional intent in that regard.

A Final Observation

As we went about compiling our findings for inclusion in this section, it seems then that a possible reason for the seeming disconnect between some of the specific items mentioned in the legislation, such as the creation of the CPP, and the intent of Congress as outlined in the Letter of Congressional Intent, such as the stipulation of certain types of incentives and the actual implementation may be due to the lack of the dissemination of the Letter of Congressional Intent to the respective Services’ secretaries. On May, 16, 2006, the letter was written to the Honorable Kenneth J. Kreig, then the Under Secretary of Defense



for Acquisition, Technology, and Logistics, and requested a meeting by June 16 to discuss how the DoD was planning on implementing Section 252 and requested a written status be presented at that meeting. There is no evidence that suggests that the meeting occurred or that the written status was provided. Mr. Kreig announced his resignation on June 6, 2007, effective July 20 of the same year. What level of circulation the letter received initially and subsequently is unknown, and while speculative, we suggest that this may be one possible reason, but not the only possible one, as to why the “disconnect” may have occurred. Additional research may be able to determine whether this suggestion is correct, or as an alternative, the complete intention of Congress in regard to the desired outcomes and means to attain those outcomes could be spelled out specifically in new legislation.

Recommendations for CPP Reforms

Based on the examination of Section 252 legislative text, SBIR-related proceedings of the National Academies Symposium, congressional guidance on Section 252, best practices available across the federal government and internationally, and the DoD-wide survey of SBIR and STTR managers, the following recommendations are made for action by the Secretary of Defense and of the military departments and, where appropriate, by Congress.

1. Create a Streamlined “One-Stop Shop” Process for Assisting SBIR/STTR Firms With Technology Transition, Including Development, Testing & Evaluation, and Procurement

It is clear from research reported in this paper that one of the main obstacles to successful technology transition in the Department of Defense is confusion and lack of information on available assistance programs within government managers and small businesses/industry alike. This confusion and lack of information forces small firms to spend much time navigating the DoD bureaucracy for technology funding sources and introduces uncertainty that discourages acquisition program managers and program executive offices from planning for insertion of technologies developed by small firms. A streamlined “one-stop shop” process for SBIR/STTR firms set up within each military department and/or within the Office of the Secretary of Defense could reduce bureaucratic barriers for small firms and interested PMs/PEOs. If an SBIR/STTR technology looks promising but would require planned and/or targeted assistance with development, testing, or evaluation, the “one stop shop” could help tailor the appropriate funding mechanisms and assist with technology roadmapping, leading to procurement by the Department of Defense under contracts or by major prime contractors under subcontracts. The “one-stop shop” could reduce or altogether eliminate the need for private advisory and assistance contractors, including venture capitalists, to act as gatekeepers for Phase III procurements and as intermediaries between defense acquisition programs and SBIR firms.

2. Raise MILDEP Acquisition Community Sponsorship of SBIR/STTR Topics From at Least 50% to at Least 75%, Seek Prime Contracts’ Recommendations of Topics for MILDEP Acquisition Community Sponsorship, and Publicly Designate the Existence of Sponsorship in the Solicitation

As our study confirms, the key technology transition best practice in the United Kingdom and the United States is market “pull” for the technology at issue that occurs when the technology addresses identified need of a defense acquisition program. For this reason,



the UK CDE does not fund SBIR topical competitions unless the topics are requested by the Defense Equipment & Supply organization (even when SBIR topics end up receiving additional technology development funding and not acquisition program funding at the conclusion of SBIR contract performance). Likewise, NASA has attempted to fundamentally reform its SBIR/STTR programs by ensuring that all its SBIR/STTR topics meet identifiable acquisition needs. In contrast, the DoD has never gone above its 50% topic sponsorship policy. Although there is a need for some SBIR/STTR topics that will further the long-term research interests of the DoD (e.g., DARPA topics and topics addressing the needs of MILDEP R&D communities), it is clear that the majority of SBIR/STTR topics must have DoD acquisition program sponsorship. Raising the DoD sponsorship policy from 50% of SBIR/STTR topics to at least 75% of topics, seeking SBIR/STTR topic recommendations from major prime contractors for military departments' acquisition community sponsorship, and requiring a public designator of topic sponsors in the R&D or acquisition communities as part of SBIR/STTR solicitations should address any disconnect between the SBIR/STTR solicitations and the needs of defense acquisition programs. It should also provide clearer notice to small firms concerning the possibility of any future procurement prospects for their technologies.

3. Confirm the Overall Authority of MILDEP Offices of Small Business Programs, Small Business Specialists, and Small Business Technical Advisers Over SBIR/STTR Transition Assistance and Incentives

The study shows that a major part of the DoD SBIR Commercialization Pilot Program, as implemented by the military departments, involved contracting for consultants, including venture capitalists, to serve as “transition agents” and evaluators of SBIR firms seeking Phase III contracts or enhancements to Phase II contracts. These private advisory contractors essentially act as source selection “gatekeepers” for Phase III procurements (for example, by pre-selecting candidates presented to Army acquisition program managers for Army CPP funding and procurement assistance, thereby making initial eligibility and responsibility determinations) or as intermediaries between defense acquisition programs and SBIR firms (for example, within the Air Force and the Navy).

However, the current CPP approach duplicates existing responsibilities of OSD agency and MILDEP directors of Offices of Small Business Programs and their small business specialist and small business technical advisers embedded in buying commands and activities. The OSBP directors and their small business acquisition workforce oversees, and advocates for increase in, small business prime contracting and subcontracting participation under the existing legal and regulatory framework, such as 15 U.S.C. § 644(k), FAR 19.201, DFARS 219.201, and DFARS PGI 219.201. The current CPP approach also ignores the recommendations of the National Academies of Sciences to support SBIR Phase III efforts by using existing incentives for subcontracting with small firms. The Phase III Commercialization Symposium highlighted the experience of the Navy Program Executive Office for Submarines (PEO Subs) in utilizing existing subcontracting incentives.

Therefore, it is recommended that overall authority for CPP activities be conferred in the MILDEP and OSD agencies' Offices of Small Business Programs and that small business specialists and technical advisers be funded and encouraged to conduct outreach to program managers/program executive offices and prime contractors, engage in SBIR technology roadmap development, facilitate inclusion of SBIR/STTR technology transition goals into prime contractors' subcontracting plans, and facilitate testing and evaluation



funding assistance to small firms as well as subcontracting incentives for large prime contractors.

4. Realign CPP to Facilitate “Pull” of Technologies Into Defense Acquisition Through Secretarial Instructions That Clearly Define Criteria for High Military Priority of SBIR Projects as well as CPP Eligibility and Responsibility SBIR Firms in Each DoD Agency and MILDEP

The essence of the CPP structure is to realign the DoD SBIR technology acquisition process from a “push” by SBIR firms trying to convince the DoD to purchase their products and services to a “pull” of SBIR technologies by DoD acquisition programs (both at the government and the prime contractor level). This realignment is necessary to reverse the attitude inside the DoD that SBIR set-asides are a “tax” against mission-focused DoD acquisition and RDT&E funds. The study indicates that CPP eligibility criteria are not well defined by the DoD and the MILDEPS. They appear to be left to the discretion of the CPP contractors, including private venture capitalists. Thus, the focus of evaluation shifts to whether an SBIR firm has already developed on its own a profitable government acquisition market, not whether the technology is a priority for the Department of Defense or a military department and one or more of its acquisition program executive officers or program managers.

Moreover, the current poorly defined CPP eligibility criteria appear to violate the Small Business Act ban on excluding small firms from contracts without Certificates of Competency. Under the Small Business Act, government contracting officers are not allowed to deny small businesses the awards of any contracts for perceived lack of any “elements of responsibility, including, but not limited to capability, competency, capacity, credit, integrity, perseverance, and tenacity...without referring the matter for final disposition” and a Certificate of Competency to the Small Business Administration.¹² Phase III contracts to SBIR firms are not excluded from this requirement for a CPP determination.

Secretarial instructions should clearly provide for (1) Secretarial certifications of high military priority for SBIR technologies before such technologies are selected for CPP; and (2) a process for evaluation of SBIR firms’ business, financial, and manufacturing capabilities that may provide for assessment by business development contractors as well as appeal to the SBA for a Certificate of Competency.

5. Publish Results of Quadrennial Review Concerning SBIR/STTR Topic Alignment With DoD R&D Plans and Program Manager/Program Executive Officer Inputs

The study suggests that few SBIR/STTR agencies have conducted the periodic Quadrennial SBIR/STTR topics review. This review has the potential to improve the usefulness of SBIR/STTR set-asides and encourage greater Phase III awards by aligning SBIR/STTR focus areas with DoD R&D Plans (Defense Technology Area Plan, Basic Research Plan, and Joint Warfighting Science and Technology Plan) as well as acquisition programs’ inputs and the DoD Quadrennial Defense Review.

OSD and MILDEPs should conduct such review and publish its results.

¹² 15 U.S.C. 637(b)(7)(A) (2011).



6. Expand CPP to the STTR Program to Enable Access to MILDEP Testing and Evaluation Facilities, Including Naval Warfare Centers and DoD Academic Institutions, Such as the Naval Postgraduate School

To the extent that SBIR and STTR technologies suffer from the risk of insufficient testing, one major incentive would involve greater access of SBIR and STTR firms to military testing facilities and funding for testing and evaluations at these facilities. Such facilities would include the elements of the Naval Warfare Centers Enterprise such as the Naval Surface Warfare Center and the Naval Undersea Warfare Center, as well as military postsecondary academic institutions such as the Naval Postgraduate School, the Air Force Institute of Technology, and the military Service academies.

Specifically, the Small Business Act should be amended to (1) provide for eligibility of the military postsecondary academic institutions to participate in the STTR program on the same terms as Federally Funded Research and Development Centers (FFRDCs); and (2) confirm the ability of SBIR and STTR CPP firms to use CPP assistance for testing and evaluation activities at military testing and evaluation facilities and military postsecondary academic institutions.

7. Expressly Describe Authorized Acquisition Incentives and Other Types of Incentives in CPP Legislation

It seems clear from the study that the DoD and MILDEP SBIR and STTR managers do not fully comprehend the full range of incentives that are authorized under the CPP program. This appears to be due to lack of awareness of the Congressional Guidance Letter and the proceedings of the SBIR Phase III Symposium at the National Academies. As a result, the DoD and MILDEPs have focused on hiring business advisory and assistance contractors to conduct business evaluations, outreach, and advocacy of small firms. Education and business development incentives are only one category of incentives among seven possible types of incentives listed in the Congressional Guidance Letter.

Congress should expressly list all such incentives in amended CPP legislation.

8. Establish Clear Policies Concerning Technical Assistance Vendors' Investment in SBIR/STTR Firms, Organizational Conflicts of Interest, and Performance by Such Vendors of Inherently Governmental Functions

The current CPP model appears to provide insufficient assurances against organizational conflicts of interest (OCIs) and performance of inherently government functions (IGF) by government contractors. Specifically, there is a potential for venture capital contractors to recommend for Phase III those SBIR firms that are open to future venture capital investments by the recommenders. There is also a potential for business advisory and assistance contractors to recommend only firms that utilize their business development assistance services authorized under 15 U.S.C. 638(q), Discretionary Technical Assistance, which allows SBIR and STTR agencies to contract with vendors for advisory services for individual SBIR and STTR awardees where the awardees will use part of their SBIR and STTR awards to pay for such advisory services. Under FAR 9.505, contracting officers must structure acquisitions with the goal of "preventing the existence of conflicting roles that might bias a contractor's judgment...[and] unfair competitive advantage." Under FAR 9.504, the contracting officer issuing a solicitation (or any solicitation-type CPP invitation for future Phase III or Phase II Enhancement awards) must



recommend a plan to the head of contracting activity for resolving any significant potential conflicts of interest. Moreover, under the FAR, Congress, the OSD, and the MILDEPs should absolutely and unequivocally prohibit contractors that are or may be involved in advising or investments to SBIR or STTR firms from participating as advisors on CPP evaluation (including any Phase II enhancements or Phase III awards).

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